Energy Efficiency

Vedder, Hans

Published in:
Essential EU Climate Law

6
Energy efficiency

ABSTRACT

- EU Energy Efficiency Law consists of the general Energy Efficiency Directive 2012/27/EU and the other measures concerning specific energy efficiency standards set for certain products and goods, such as buildings, electrical appliances and tyres;
- EU energy efficiency policy is formulated with a dual climate change and security of supply objective in mind;
- The Energy Efficiency Directive provides for an EU-wide energy efficiency target, but most importantly lays down non-binding minimum energy efficiency contributions for the Member States as well as a methodology for calculating such contributions;
- The Energy Efficiency Directive and the other EU acts concerning energy efficiency standards envisage the introduction of market-based mechanisms to ensure cost-effective implementation of energy efficiency measures;
- The Directives contain a methodology for determining cost-effective investments in energy efficiency;
- The Energy Efficiency Directive and the other measures take into account the higher costs of increasing energy efficiency for those Member States where the level of energy efficiency is already relatively high, thus taking into account the need to ensure solidarity between the Member States;
- Solidarity at the level of individual energy consumers is also taken into account where network tariffs and their impact on energy efficiency is concerned;
- As far as concrete measures are concerned, the focus of energy efficiency legislation is on buildings, since these account for a large percentage of energy use;
- The effectiveness of the energy efficiency measures can be doubted as a result of:
  - The non-binding nature of the national energy efficiency contributions;
  - The general reluctance by EU Member States to submit to strict energy efficiency targets;
  - The EU's poor track record on increasing energy efficiency.

6.1 INTRODUCTION

EU energy efficiency policy goes back quite some time, with the 1991 SAVE programme the earliest example of EU involvement.[1] Such action finds its legal basis in what is currently Article 191 TFEU, insofar as it refers to the 'prudent and rational utilisation of natural resources' and the source principle, requiring environmental problems to be dealt with at the source. In addition to the environmental legal basis, Article 194(1)(c) TFEU now explicitly enables the EU to adopt measures to 'promote energy efficiency and energy saving'. Both the environmental and the energy legal basis thus enable the EU to adopt measures in the field of energy efficiency. In addition to these legal bases, energy efficiency-related acts have been adopted on the basis of the Common Commercial Policy (external trade).[2] This underlines the dual nature of energy efficiency measures as measures at the crossroads of product standards, environmental protection and security of supply. EU energy efficiency legislation can be separated into a general Directive as well as the Directives and Regulations applicable to the different products or goods for which specific rules have been formulated:

- Directive 2012/27/EU (Energy Efficiency Directive)[3]
- Directive 2010/31/EU (Energy Performance of Buildings Directive)[4]
- Regulation 2017/1369 (Labelling Regulation)[5]
- Directive 2009/125 (Eco-design Directive)[6]
- Measures concerning various products for which energy efficiency standards have been set pursuant to the Eco-design Directive or the Labelling Regulation, such as electronic displays.[7]

We will explain that the main problems arising in relation to energy efficiency regulation tie in with the differing levels of energy efficiency between the Member States and the resulting

---

[1] SAVE is the wonderfully far-fetched acronym for Specific Actions for Vigorous Energy Efficiency and was adopted by means of Decision 91/565, OJ 1991 L 307/34. Note that as early as 1985 the Council called upon the Member States to promote energy saving policies.

[2] For example, the Energy Star Agreement: see Case C-281/01 *Commission v Council* (Energy Star) ECLI:EU:C:2002:761.

[3] As amended by Directive 2013/12, OJ 2013 L 141/28; Directive 2018/844, OJ 2018 L 156/75; and Directive 2018/2002, OJ 2018 L 328/210. A consolidated version is available from: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A02012L0027-20201026&qid=1607943292093 last accessed 22 June 2021.

[4] As amended by Directive 2018/844, OJ 2018 L 156/75. A consolidated version is available from: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A02010L0031-20181224&qid=1607943350319 last accessed 22 June 2021.

[5] OJ 2018 L 198/1. This repeals Directive 2010/30, OJ 2010 L 153/1, the Labelling Directive.

[6] OJ 2009 L 285/10, as amended by Directive 2012/27/EU on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC, OJ 2012 L 315/1.

[7] Annex II A of Commission Regulation (EU) 2019/2021 laying down ecodesign requirements for electronic displays, OJ 2019 L 315/241, contains the maximum energy efficiency index for such screens.

differences in costs to increase energy efficiency. In some Member States buildings are on average better insulated, or heat and electricity generation and distribution are more efficiently organised, than in others. Also, the differing climatic situations in the Member States impact the demand for heat, for example. This results in cost-effectiveness and solidarity playing a major role, not only because increasing the energy efficiency of an already highly efficient system involves relatively high costs, but also because the investments required for extra energy efficiency must be affordable in relation to the GDP of that Member State. Below we will first examine the basics of energy efficiency (section 6.2) and then take a closer look at the Energy Efficiency Directive (section 6.3). After that we will study the Energy Efficiency of Buildings Directive (section 6.4) and the Labelling Regulation (section 6.5). Finally, the other energy efficiency-related measures will be scrutinised in section 6.6. Section 6.7 concludes.

6.2 BASICS OF ENERGY EFFICIENCY

Energy efficiency is the relation between the amount of energy put into a certain process and the result of that process. Generating electricity, for example, often involves the combustion of primary energy sources with the resultant thermal energy being converted to kinetic energy that drives turbines. These in turn drive generators, with the production of electrical energy as the final result. This is then transported to the end-user, but resistance losses mean that the amount of electrical energy delivered to the end-user will be lower than the amount fed into the grid. The end-user, finally, will want to convert that electrical energy into light or motion and thus personal utility, but this will also involve losses. Incandescent light bulbs, for example, produce not just visible light, but also an overwhelming amount of thermal energy (heat). The losses provided in this example all come with negative environmental effects arising from the combustion of fossil fuels and thus carbon dioxide emissions, without resulting in any utility for the end-user. If we require extra utility at the same level of or with a reduced energy efficiency, that means more waste and emissions. Increased energy efficiency, on the other hand, replaces the need to use other energy resources, resulting in some authors calling energy efficiency an (or first) energy source in its own right.[8]

Energy saving through increased energy efficiency is often said to be the best way to deal with the climate change impact of energy use, as well as with security of supply and energy poverty.[9] It therefore features prominently in the EU's 20-20-20 goals.[10] The recently adopted Clean Energy for All Europeans Package also devotes significant attention to energy efficiency, setting a 32.5 per cent target for 2030.[11] In addition, increased energy efficiency plays an

[8] M. Yan and X. Yu, *Energy Efficiency*, Springer, 2015, pp.11 et seq.

[9] Commission proposal for the Energy Efficiency Directive, COM (2011) 370 final, p.1. See more recently, the Commission's European Energy Security Strategy, COM (2014) 330 final, chapter 3. Note that energy efficiency was also relevant during the oil crisis of the 1970s.

[10] See Chapter 2.

[11] This package was proposed by means of COM (2016) 860 final and acquired political approval on 30 November 2018: see Commission press release IP/18/6870. In relation to energy efficiency, it has resulted in Directive 2018/2002,

important geopolitical role for the EU, as reduced energy consumption allows for a reduction of imported (fossil) fuels and thus a higher level of supply security. Increased energy efficiency may well be the way in which we can maintain as much as possible of our existing way of life at a lower carbon cost, but it is very much a technical issue with a different impact for each Member State. Increasing energy efficiency means, among others, investing in insulation of buildings and industrial installations; changing the way buildings are heated – for example by using residual heat; and changing the way in which electricity networks are operated. All of these measures require considerable investments, for example in the creation of a heat network. This translates into fairly technical rules that entail a prominent role for cost–benefit analyses, as we will see below. The EU's energy efficiency target is not part of the 2009 climate and energy package and is otherwise set apart from the instruments in the 2009 climate and energy package.[12] The reason for this is that it deals with energy efficiency at a relatively high level of abstraction that leaves considerable room for the widely different backgrounds of the Member States in terms of climate conditions and current levels of energy efficiency. Moreover, it envisages an important role for cost-effectiveness considerations.[13] The importance of cost-effectiveness results from the observation that increasing energy efficiency involves significant investments that will pay off only in the long term. This is compounded by the fact that such investments will be more significant when the level of energy efficiency is already higher. When the level of energy efficiency is relatively low, simple and cheap investments can lead to significant increases in energy efficiency. However, transforming an already highly energy-efficient building into a zero-energy building may very well be impossible and in fact require the complete reconstruction of the building. It is not difficult to see that the costs of the latter are far greater than those involved in putting in double glazing and adding insulation.

Energy efficiency can be increased in a number of ways, but by and large they boil down to technical, network, financial and behavioural solutions. On the technical side, energy efficiency can be increased by changing to more energy-efficient equipment, such as switching from incandescent light bulbs to LEDs or installing more efficient turbines in power plants, or simply adding insulation. On the network side, losses in transmission and distribution networks can be reduced by dispatching power from generation sources that are closer to the demand centres. Another network-based solution would be to use the thermal energy (waste heat) from, for example, power plants to heat buildings or as an input in another industrial process. This requires a network to transport not only the electrical energy, but also the heat from that plant. As far as financial incentives are concerned, investments in increased energy

---

OJ 2018 L 328/210, which has raised the EU objective to a 32.5per cent increase in energy efficiency for 2030 compared to the 2007 baseline.

[12] The 2009 package was published in [2009] OJ L 140 and does not address energy efficiency as such. Note that the Commission's proposal did include energy efficiency as part of a package that addressed greenhouse gas abatement and renewable energy production: COM (2008) 30 final.

[13] Cf. recital 21 of the preamble to Directive 2012/27 and Article 1(1) of the Energy Performance of Buildings Directive.

efficiency are almost always profitable as they will result in lower energy costs. However, the capital costs may outweigh the reduction in energy costs in the short term, and thus make it financially unattractive to invest in energy efficiency. Similarly, in relation to rented buildings, there is a financial impediment resulting from the so-called split incentive. The split incentive results from the fact that in buildings that are rented, the investment in increased energy efficiency is financed by the owner whereas the tenant enjoys the advantages. On the behavioural front, an obvious solution would be to get end-users to switch off the lights when nobody is in a certain room. This requires an increased level of awareness on the part of that end-user. This would also address the energy efficiency paradox or rebound effect, according to which increases in energy efficiency actually trigger more energy consumption.[14] The bottom line is that energy efficiency is notoriously difficult to implement in practice. This is evidenced, for one, by the progress reports drawn up by the Commission. Each year since 2015, these reports have concluded that progress was insufficient to attain the energy efficiency targets set by the Member States or at the EU level.[15]

6.3 THE ENERGY EFFICIENCY DIRECTIVE

Directive 2012/27/EU (the Energy Efficiency Directive) replaces Directive 2004/8/EC on Cogeneration and Directive 2006/32/EC (the 2006 Energy Efficiency Directive).[16] It essentially lays down rules to ensure that the EU achieves its 32.5 per cent energy efficiency target[17] and rules intended to overcome the market failures[18] impeding energy efficiency increases. The Directive is adopted on the basis of Article 194(2) TFEU, the energy legal basis, and explicitly allows for stricter measures, that is, higher energy efficiency standards, insofar as these meas-

[14] This is also referred to as Jevons' Paradox after the British economist who noticed that coal consumption did not decrease after coal-fired steam engines had become more efficient. For a survey see: B. Alcott, 'Jevons' Paradox', *Ecological Economics*, 2005, vol. 54, pp.9–21.

[15] Cf. 2015 assessment of the progress made by Member States towards the national energy efficiency targets for 2020, (COM(2015) 574); 2016 assessment of the progress made by Member States towards the national energy efficiency targets for 2020, (COM(2017/056); 2017 assessment of the progress made by Member States towards the national energy efficiency targets for 2020, (COM(2017)687); 2018 assessment of the progress made by Member States towards the national energy efficiency targets for 2020, (COM(2019) 224); 2019 assessment of the progress made by Member States towards the national energy efficiency targets for 2020 (COM(2020) 326).

[16] OJ 2012 L 315/1, see Arts 27 and 28 on repeals and transposition. Note that this Directive was amended by Directive 2013/12/EU, OJ 2013 L 141/28 to reflect the accession of Croatia and most recently by means of Directive 2018/844, OJ 2018 L 156/75, to implement the Clean Energy for All Europeans Package. This last amendment essentially entailed the moving of the provisions on long-term renovation strategies for buildings, the old Article 4, to the Energy Performance of Buildings Directive: see recital 8 of the preamble to Directive 2018/844.

[17] This 32.5 per cent target is provided for in the Climate Governance Regulation, Regulation 2018/1999, OJ 2018 L 328/1, Recital 6 to the preamble, Article 2(11) and 4(b)(1), see Chapter 11.

[18] Such as the split incentive in buildings that are rented out: see section 6.4 below and in energy efficiency increases in the transmission, distribution and transformation of energy, see section 6.3.3 below.

ures are compatible with EU law. It contains rules on the indicative national energy efficiency targets (discussed below in 6.3.1), efficiency in energy use (discussed below in 6.3.2), efficiency in energy supply (analysed in 6.3.3 below), efficiency provisions that apply generally (discussed in 6.3.4 below) and some final provisions that will not be dealt with separately.

6.3.1 EU Energy Efficiency Targets and National Contributions Thereto

Defining energy efficiency

As energy efficiency is essentially the relation between the amount of energy put into a certain process and the useful energy obtained from that process, the Energy Efficiency Directive first defines a number of common standards for determining energy efficiency. This efficiency can be expressed in a number of terms, which relate to the production or consumption of energy and the difference between these. In this regard the Directive refers to, respectively, *primary* energy consumption, *final* energy consumption and *primary* or *final* energy saving or energy intensity.[19] 'Energy' is given a very broad definition that basically includes all forms of energy.[20] Primary energy consumption is defined as gross inland consumption, excluding non-energy uses. This concept encompasses all the oil, gas and other primary energy sources as well as electricity produced in or imported into a country. Final energy consumption refers to all energy supplied to final consumers, excluding supply to the energy sector and the energy transformation sector.[21] These sectors are excluded as they do not use energy as final consumers, but rather as intermediary parties that will ultimately supply final consumers. Energy saving consists of the difference between the (estimated or measured) amount of energy used before and after efficiency improvement measures have been implemented.[22] This means that – at the household level, for example – energy savings can be calculated as the difference between the amount of electrical energy consumed before and after an old inefficient washing machine is replaced with a new energy-efficient one. Another way of measuring energy efficiency is by means of energy intensity. This is the amount of energy used in a country divided by the gross domestic product of that country. This directly relates energy use to the economic productivity achieved with that input and follows from the fact that increased economic growth by and large connects to increased energy consumption. A decrease in energy intensity thus points to a decoupling of economic growth and energy consumption that equates to increased energy efficiency.[23]

---

[19] Article 3(1) Energy Efficiency Directive.

[20] Article 2(1) Energy Efficiency Directive.

[21] The energy transformation sector is a concept that is undefined in the directive. It refers to the industry that transforms one form of energy (e.g. kinetic energy) into another form (e.g. electrical energy).

[22] Article 2(5) Energy Efficiency Directive.

[23] It could, for example, mean that more goods are produced and transported with the same or a reduced energy consumption.

Energy efficiency targets

Although the EU has set itself a 32.5 per cent energy efficiency target, it requires the Member States to actually achieve this target.[24] Despite the various buildings operated by the EU institutions,[25] the majority of energy consumption obviously takes place in the Member States. It is therefore at Member State level that the most significant energy savings can be achieved. This is also where we can see obvious differences between the Member States, both in terms of energy intensity and of the reductions in energy intensity that have been achieved.[26] Moreover, we also see obvious differences in the means used to attain energy efficiency increases, with the two smaller island states of Malta and Cyprus being mentioned specifically and receiving special targets.[27]

To this end, Article 3(1) requires the Member States to set indicative energy efficiency contributions (referred to as an 'indicative national energy efficiency target' in the text) in their national energy and climate plans, in such a way that the EU does not exceed a certain amount of energy consumption defined as million tonnes of oil equivalent in 2020. As a result, the Member States, irrespective of how they define their energy efficiency target, also have to express their targets in an absolute level of primary or final energy consumption. However, apart from the hard target set at EU level, the Member States shall also take into account various other factors such as 'other measures to promote energy efficiency'.[28] With regard to the 2030 32.5 per cent target, the Member States shall set indicative national energy efficiency targets in a similar way and report their progress to the Commission.[29] We see the cost–benefit analysis prominently where Article 3(6) of the Directive provides for the possibility of an upward revisioning of the target, inter alia, 'in the event of substantial cost reductions resulting from economic or technological developments'.

Furthermore, they may also take into account factors affecting energy consumption, such as economic growth forecasts, changes in energy imports and exports and the development of renewables, nuclear energy and CCS. The targets were to be set for the first time in 2014 in order to enable the Commission to assess whether the EU is likely to achieve the 20 per cent target.[30] It may be noted that the Commission is only allowed to issue recommendations and that the text of the Directive does not in any way guarantee that the EU will attain its objec-

---

[24] Directive 2018/2002, recital 6 and Article 1(1).

[25] The buildings in Brussels are in fact rented from the Brussels capital region and thus fall under the Belgian rules implementing the Energy Efficiency of Buildings Directive. See further the answer by Energy Commissioner Oettinger to Parliamentary question E-007805-13, available at: www.europarl.europa.eu/sides/getDoc.do?type=WQ&reference=E-2013-007805&language=EN last accessed 22 June 2021.

[26] For example S.R. Schubert, J. Pollak and M. Kreutler, *Energy Policy of the European Union*, Palgrave, 2016, p.181.

[27] Directive 2018/2002, recital 13.

[28] Article 3(1)(d) Energy Efficiency Directive.

[29] Article 3(5) Energy Efficiency Directive.

[30] Article 3(2) Energy Efficiency Directive.

tive.[31] In this respect the Directive confines itself to laying down a reporting obligation for the Member States as well as a duty to include their contributions to the EU target in the integrated national energy and climate plans they need to submit on the basis of the Governance Regulation.[32]

6.3.2 Efficiency in Energy Use

The directive recognises the importance of energy efficiency in energy use but also the wide range of energy uses, ranging from building to industries and appliances. Therefore, other EU laws (directives and regulations) are also relevant when discussing efficiency in energy use. One example is energy efficiency in buildings, which is governed by the Energy Efficiency Directive and the Energy Performance of Buildings Directives (see further section 6.4).

The Energy Efficiency Directive provides some guidance as to how Member States can achieve efficiency contribution in energy use. For example, it recognises that central governments can play an important role in their purchasing decisions. Article 6 requires the Member States to ensure that central government public procurement results in the purchase of products, services and buildings with high energy efficiency performance insofar as this is consistent with other considerations laid down in Annex III. This is closely connected to the public procurement procedures in general, as is evidenced by the fact that the thresholds laid down in the Public Procurement Directive determine whether the obligation applies. Green public procurement is fairly well established and widely accepted by the European institutions.[33] The interesting trade-off surfaces when we see that such purchasing is to be consistent with, *inter alia*, sufficient competition. This refers to the fact that Annex III requires the purchase to concern only those products that comply with the highest EU standards, but this may well exclude several competitors (that do not meet these standards), thus potentially harming the public procurement process itself. Again, lower levels of government are not directly concerned, and the Member States shall only 'encourage' them to purchase highly energy-efficient equipment, services and buildings.

Of more relevance to non-state actors is Article 7, which prescribes the actual energy savings obligation that the Member States are to achieve. The article contains detailed rules on how these reductions are to be calculated and assigned to the various reporting periods. This is where we also find the derogation for Cyprus and Malta.[34] Article 7(10) requires the Member States to achieve these energy savings by means of an energy efficiency obligation or an alternative measure; in doing so, they are to take into account the need to alleviate energy poverty.[35]

---

[31] Article 24(3) Energy Efficiency Directive.

[32] Article 3(5) Energy Efficiency Directive. Confusingly, the Directive also refers to the National Energy Efficiency Action Plans as another means of communicating the progress on meeting the EU target.

[33] More information, including the criteria that have been developed for green public procurement, can be accessed from http://ec.europa.eu/environment/gpp/index_en.htm last accessed 22 June 2021. See further Case C-513/99 *Concordia Bus* ECLI:EU:C:2002:495 and Case C-448/01 *Wienstrom* ECLI:EU:C:2003:651.

[34] Article 7(1)(b) Energy Efficiency Directive.

[35] Article 7(11) Energy Efficiency Directive.

Pursuant to Article 7a(2), an energy efficiency obligation may be imposed upon energy distributors and/or retail energy supply companies. The term energy distributor encompasses all distribution system operators (DSOs)[36] as well as other companies responsible for selling and transporting energy to consumers outside the context of the regulated electricity and gas networks. The retail energy sales company is normally referred to as a supply company in electricity and gas law, but again the wider scope of the Directive necessitates a broader term.[37] Under these obligation schemes the obligated companies are responsible for achieving a cumulative energy savings target by the end of 2020.[38] It may be noted that Article 7(6) allows for some flexibility in meeting these targets.[39] This flexibility allows them to take into account energy savings by third parties as well as energy savings in earlier or later years (banking).

The last sentence of Article 7(6) provides for further flexibility since it allows the Member States to take measures to reduce the costs of direct energy savings in energy-intensive industries exposed to international competition. This aligns with the powers to grant state aid to such industries.

Whereas the scheme of obligated companies already offers considerable flexibility, member states are not bound to this instrument and instead can opt for alternative instruments pursuant to Article 7b. Compared to the older version of the Energy Efficiency Directive, the framework for such alternative instruments is even less well-defined. This is problematic as research shows that the majority of Member States have opted for a fund as an alternative instrument.[40] The main proviso that such measures must be equally effective and comply with the conditions laid down in the Directive, for example, has been dropped after the amendments brought by Directive 2018/2002. The only remaining condition in the current version is that the alternative instruments must ensure that the energy savings are achieved among final customers.[41] The old version of the Directive suggested the use of energy taxes and voluntary agreements as alternative instruments. These come with different conditions for compliance with EU law as an energy tax will have to comply with Article 110 TFEU whereas the agreement must be compatible with Article 101 TFEU. For the Member States, this offers considerable leeway that will be difficult to challenge for a private party on the basis of the Directive, as the *Saras* case shows.[42] Saras Energía sought to challenge the Spanish implementation of this provision. This implementation essentially forced Saras to pay into the Energy Efficiency National Fund

---

36 Article 2(20) Energy Efficiency Directive.

37 See Article 2(19) of Directive 2009/72, OJ 2009 L 211/55.

38 Companies become obligated following a designation on the basis of objective and non-discriminatory criteria: Article 7(2) Energy Efficiency Directive.

39 This is a mechanism comparable to that limiting the use of Kyoto flexible units as part of the EU ETS cf. Article 5 of the Effort Sharing Decision.

40 J. Rosenow and F. Kern, 'EU Energy Innovation Policy: The Curious Case of Energy Efficiency', in R. Leal-Arcas and J. Wouters (eds), *Research Handbook on EU Energy Law and Policy*, Edward Elgar Publishing, 2017, p.506.

41 Article 7b(1) Energy Efficiency Directive.

42 Case C-561/16, *Saras Energía*, ECLI:EU:C:2018:633.

without offering it any possibility to achieve energy efficiency targets by actually saving energy. This was made even more unacceptable to Saras because only retail energy sales companies had to contribute, whereas energy distributors would not have to pay.[43] The Court ruled essentially that the member states have a broad margin of discretion that is, however, constrained by the Directive's bottom line.[44] This bottom line is that companies should save energy and just paying into a fund does not save energy as such. This means that the Court then tests whether the contribution requirement qualifies as an alternative measure within the meaning of the Directive.[45] All in all, the Directive provides the Member States with very considerable discretion and imposes only a minimal burden on Member States to show compliance. This is arguably a rather low threshold, supporting the conclusion that the effectiveness of this Directive can be doubted.[46] This considerable margin for discretion is maintained, if not expanded,[47] in the current version of the Energy Efficiency Directive.

Concerning the imposition of the duty to contribute on only some energy companies, the Court finds that a Member State's discretion in this regard is limited by the duty to designate the obligated companies on the basis of explicitly stated objective and non-discriminatory criteria.[48] This, in the view of the Court, means that the specifics of the national energy market must be taken into account in deciding which companies are included and excluded from the duty to contribute. As a result, considerations regarding the level playing field of the national energy markets are closely linked to the Member State's decision regarding the actual imposition of the duties that are required to attain the energy efficiency targets.[49]

Awareness of energy use

Much energy efficiency results from awareness and behavioural change. To this end the Directive requires the Member States to ensure that high-quality, cost-effective energy audits are available to all final customers. The Directive lays down rules on the qualification and impartiality of the experts as well as the quality assurance for the audits in Article 8. Whereas such audits are voluntary for households as well as small and medium-sized enterprises, they are required for larger companies from 2015 onwards (Article 8(4)), unless such companies

[43] Case C-561/16, *Saras Energía*, ECLI:EU:C:2018:633, para. 14.

[44] Case C-561/16, *Saras Energía*, ECLI:EU:C:2018:633, paras 24 and 27–29.

[45] Case C-561/16, *Saras Energía*, ECLI:EU:C:2018:633, paras 29–34. Note that this refers to the old version of the Energy Efficiency Directive. The abandonment of these conditions following the entry into force of Directive 2018/2002 means that the Member States have even more leeway.

[46] These fears were expressed during the negotiations of the Directive: S.R. Schubert, J. Pollak and M. Kreutler, *Energy Policy of the European Union*, Palgrave, 2016, pp.184, 185.

[47] See the comments above in relation to Article 7b of the Energy Efficiency Directive.

[48] Case C-561/16, *Saras Energía*, ECLI:EU:C:2018:633, para. 53.

[49] Notably the reference to recital 20 of the preamble supports this conclusion: Case C-561/16, *Saras Energía*, ECLI:EU:C:2018:633, para. 54.

have a certified environmental management system.[50] In all cases, the audits must comply with the requirements in Annex VI. Further awareness-raising takes place on the basis of Article 12 on consumer information and empowering.

Another awareness-raising provision can be seen in Article 9 on metering. This provision requires the Member States to ensure, insofar as this is technically possible and economically sensible, that every energy user gets what is often referred to as a smart meter. This is a meter that provides real-time information on actual energy consumption. Strictly speaking, the Directive does not require the installation of a smart meter, but rather a 'competitively priced individual meter' that only needs to provide real-time information on energy usage. Smart meters add a two-way communication functionality to this real-time information functionality.[51] The Directive contains rules on the roll-out of such meters that essentially imply that their installation is mandatory for new buildings and buildings that undergo major renovation. For all other cases, individual meters must be installed whenever an old meter is replaced unless this is technically impossible or not cost-effective in the light of the estimated long-term savings. This element of cost-effectiveness is central to the Energy Efficiency Directive and will be addressed in some more detail below.

From Article 9(2) we can furthermore gather that the rules in the Electricity Directive determine whether or not smart meters will be rolled out. The Directive contains some rules on the functionality of such smart meters, including requirements concerning data and privacy protection that have nothing to do with energy efficiency as such. Whereas individual meters are most easily envisaged in relation to electricity and gas, individual metering can play an important role in relation to district heating and/or cooling and domestic hot water consumption, as is envisaged by Article 9a.

The provisions on metering are reflected in those on billing. Here, again, the information needs to reflect individual energy use as much as possible, including information on historical energy use, where this is technically possible and economically justified. Such billing information shall be disseminated to the final customers free of charge so that the consumer gets insights into the actual energy use and is thus enabled and incentivised to save energy. These rules largely concern energy consumption and the ability and incentive to reduce energy consumption. The potential for energy efficiency increases is not confined to the final consumer, but also includes energy suppliers.

6.3.3 Efficiency in Energy Generation, Transmission, Distribution and Supply

Of course, the final energy user is only one of the links in the energy chain where energy efficiency matters. From production and generation at the upstream level to transmission and distribution to end-consumers, energy is lost and thus energy efficiency gains can be achieved.

---

[50] Rules for such EMASs are laid down in Regulation 1221/2009, OJ 2009 L 342/1; see further Commission Decision 2013/131, OJ 2013 L 76/1.

[51] See also Chapter 9. Note that the roll-out of smart meters is also regulated in Directive 2009/72, the Electricity Directive, Article 3(1)) and Annex I, point 2.

This starts with the production of heat and cooling as part of the generation of electricity (residual heat), but also with the production of heat and cooling as such. Member States are obliged to assess the potential for high-efficiency cogeneration and efficient district heating and cooling, including a cost–benefit analysis.[52] If the benefits outweigh the costs, the Member States are under an obligation to take adequate measures for the development of efficient district heating and or cooling and high-efficiency cogeneration. The Directive also contains provisions on the connection to the grid of high-efficiency cogeneration.[53] By and large, Article 14 of the Energy Efficiency Directive is characterised most prominently by the central role played by cost–benefit analyses, and not so much by the actual impact of these measures in terms of energy efficiency.

Apart from the production and generation of energy, the transformation, transmission and distribution sectors also involve potential for energy efficiency. Article 15(1) requires the Member States to ensure that national energy regulators pay due regard to energy efficiency and that there are incentives for grid operators to make system services available to network users in the context of smart grids. These system services concern the activities that are needed to ensure the reliable functioning of the grid, such as balancing input and consumption and voltage control.

Currently, most of these services are provided at the upstream level, which entails potential reductions in energy efficiency. A smart grid would also allow for such services to be provided at the downstream level. Smart grids are energy (primarily electricity) grids that enable bi-directional flows from decentralised (renewable) production and demand response. Smart grids allow a wider uptake of intermittent renewable energy and allow for a more efficient operation of the grid, for example by reducing the need for spinning reserves.[54] Instead of using centralised generation and large-scale demand response connected to medium to high-voltage grids, local low-voltage demand response is used to balance peaks in renewable energy that is fed into the grid at lower voltages. This, for one, reduces the need to use transformers, and the losses inherent in these.

Including demand response, which concerns the flexibility in energy demand, can improve the efficiency of these system services and thus system operation. Tariffs should be amended so that there is no incentive for inefficiency in the system operation and to ensure that demand response is encouraged.[55] In relation to solidarity between network users, we may refer to Article 15(3) that allows the Member States to maintain network tariffs that serve a social purpose. This could relate to lower tariffs for people with a lower income. In this regard, the Member State is under a duty to investigate the effects on energy efficiency. Relatively low

[52] Article 14(1) and (3) of the Energy Efficiency Directive.

[53] These provisions are elaborated in Annex XII to the Directive.

[54] This refers to installations where reserve generating capacity is spinning, thus using primary energy sources, without being coupled to the grid and thus not producing usable energy. It essentially means that there is a power plant with a continuously running generator that is not delivering electricity to the grid unless it is asked to do so by the system operator.

[55] This is elaborated in Annex XI to the Directive.

tariffs reduce the incentive to invest in energy efficiency. However, such investments may not be available to lower incomes in the first place, which raises the question whether subsidisation of such investments may not be more (energy-) efficient than maintaining socially motivated tariff structures.

Finally, the Directive creates a framework to encourage demand-side management and aggregators.[56] Most importantly, system security remains the prime objective and the energy efficiency measures may never jeopardise the safe and reliable functioning of transmission and distribution systems.

6.3.4 Markets and Cost-effectiveness in Energy Efficiency

The provisions mentioned above often refer to cost-effectiveness as a guiding principle. However, the problem is that there is an asymmetric relation between costs, benefits and thus incentives to invest in energy efficiency. In a nutshell, the costs for increased energy efficiency often fall upon the energy end-user, who then reaps the benefits of reduced energy consumption and thus has an incentive to invest in such energy saving measures. Smart meters or individual meters, however, are most likely to be rolled out by the supply side of the market: distribution system operators, supply companies or other market participants. These parties essentially have no incentive to invest in such meters if the result is that their energy sales (or distribution) decrease. In other words, if the roll-out of smart meters works as it is supposed to, these companies will actually see a reduction of their income as they will sell or transport lower amounts of energy. This is exactly why cost-effectiveness plays such a central role in the Energy Efficiency Directive. It is operationalised by means of the framework and criteria laid down in Annex IX to the Directive. However, rather than mentioning cost-effectiveness every time, the introduction of market mechanisms is also generally assumed to deliver efficiencies. This follows from the fact that a competitive market will generally ensure optimal efficiency of the energy services provided whereas the provision of these services themselves may generate the income that compensates the reduced income following from the lower energy consumption.

Such mechanisms were explicitly envisaged by the current Directive's predecessor in the form of a 'white certificate scheme', whereby certified energy savings would be tradable throughout the EU.[57] This Union-level scheme is rejected in the current Directive on the basis of the excessive administrative costs involved as well as the risk that energy savings would be concentrated in a few Member States only.[58] Still, Member States are allowed to have their own white certificate trading schemes. This nicely highlights the tension between the two themes central to this book: cost-effectiveness assumed in market-based mechanisms and solidarity between the Member States. We see that the EU legislator envisages that using a market-based

[56] Article 15(8) of the Energy Efficiency Directive.

[57] Article 6(2)(b) of Directive 2006/32 envisaged a market-oriented scheme, such as one based on white certificates, that would enable increased energy efficiency at the production, supply and distribution levels. For an analysis of this and similar schemes see L.-G-Giraudet and D. Finon, 'The Costs and Benefits of White Certificates Schemes' [2012] *Energy Efficiency*, 179–99.

[58] Recital 20 of the preamble.

mechanism, widely considered to be an efficient mechanism, may result in disproportionate administrative costs. This shows at least the limits to market-based mechanisms. Furthermore, the risk that energy efficiency gains would be concentrated appears very realistic in such a market-based scheme. Member States where levels of energy efficiency are comparatively low would be able to attain considerable efficiency gains at relatively low costs. This would mean that the market mechanism directs investments in energy efficiency to those Member States, to the detriment of investments in energy savings in those Member States that are already relatively energy efficient and thus face higher marginal costs for extra energy efficiency. Here we see a clear limit to the solidarity that Member States are willing to accept, particularly in view of the fact that the brunt of such investments would be borne by the energy consumer.

However, this does not mean that the market-based approach is fully rejected. The energy efficiency obligation schemes still allow for the use of energy savings attained by energy service providers to be counted toward the obligation resting on obligated parties.[59] The idea underlying this is that energy services would be offered by energy utilities (a term that includes, but is not limited to, supply companies). This would offer them an alternative source of income to compensate for the loss in income resulting from energy supply as the latter would decrease with increased end-user energy efficiency. Another effect would be increased competition in the energy market, as the energy services would enable the supply companies to differentiate their products.[60]

6.4 ENERGY EFFICIENCY OF BUILDINGS

Buildings account for a significant amount of the EU's energy usage and offer the biggest potential for energy savings.[61] Also, in view of the fact that buildings account for approximately 40 per cent of the EU's energy use, the potential for energy efficiency increases is significant. This explains why buildings feature prominently in the Energy Efficiency Directive and are the subject of a specific directive: Directive 2010/31/EC (the Energy Performance of Buildings Directive), which aims to increase the energy efficiency of buildings.[62]

The directive does so by providing, *inter alia*, a framework for the calculation of the energy efficiency and by enabling minimum energy efficiency requirements. The minimum energy efficiency requirements are to be set by the Member States and may differentiate between

[59] Article 7a(6)(a) of the Energy Efficiency Directive. See section 6.3.2 for more information on energy efficiency obligation schemes.

[60] Recital 20 of the preamble. Supply companies can essentially differentiate their products on the basis of the price and the extent to which the energy they supply is renewable. Adding energy services would thus provide them with an extra quality aspect that allows them to differentiate their products.

[61] Commission Energy Efficiency Plan 2011, COM (2011) 109, p.3. See also the Commission Impact Assessment for this plan, SEC (2011) 277, p.9.

[62] OJ [2010] L 153/13, as amended by Directive 2018/844, OJ 2018 L 156/75. It recasts Directive 2002/91 into a consolidated text in the interest of clarity since this Directive had been amended in the past and new amendments were needed.

various categories of buildings (Article 4(1), third paragraph). This already highlights the considerable latitude that the EU leaves the Member States in this matter, resulting in significant Member State discretion. Buildings are central, together with transport,[63] to the Union's energy efficiency policy.[64] This is one of the explanations for why the Energy Performance of Buildings Directive has been much more comprehensively updated by means of the Clean Energy for All Europeans Package than the Energy Efficiency Directive.[65]

This situation, with continuing national discretion even following a significant overhaul, may be contrasted with the observation by the Commission, in the proposal for the Directive, that the energy-saving potential of Directive 2002/91/EC had not been fully achieved.[66] As a result, the proposal for the recast went beyond mere consolidation and included proposals to increase the level of energy efficiency, for example by an increase of the scope of the various measures.[67] It also deserves mentioning that the Commission explicitly noted the low level of ambition regarding the implementation of Directive 2002/91 by the Member States.[68] On a similar note, complexity and lack of clarity concerning the wording of Directive 2002/91 was noted.[69] Following two readings, the Energy Performance of Buildings Directive was adopted by the European Parliament on 18 May 2010. On the basis of the Directive, the Commission adopted Delegated Regulation 244/2010 establishing a comparative methodology framework for calculating cost-optimal levels of minimum energy performance requirements.[70]

Energy performance of buildings can be improved by renovating existing buildings. Article 2a(8) of the Energy Performance of Buildings Directive thus requires the Member States to establish a long-term strategy for building renovation as part of their integrated national energy and climate plans. As part of a leading-by-example policy, public bodies' buildings are subject to special and stricter rules in terms of renovation with a view to increasing energy efficiency. Article 5 requires the Member States to ensure that 3 per cent of the total floor area of buildings operated by the central government is renovated to meet the energy efficiency standards laid down in the Energy Performance of Buildings Directive.[71] In any case, the rules only

---

63 Cf. M. Ntovantzi et al., 'Do We Have Effective Energy Efficiency Policies for the Transport Sector? Results and Recommendations from an Analysis of the National and Sustainable Energy Action Plans', ECEEE Summer Study Proceedings, p.895.

64 M. Economidou, V. Todeschi, P. Bertoldi, D. D'Agostino, P. Zangheri and L. Castellazzi, 'Review of 50 Years of EU Energy Efficiency Policies for Buildings', *Energy and Buildings*, 2020, vol. 225.

65 Directive 2018/844, OJ 2018 L 156/75, contains more than ten amendments to the Energy Performance of Buildings Directive and only one amendment to the Energy Efficiency Directive.

66 OJ 2002 L 1/65.

67 COM (2008) 780, at pp.3 and 5.

68 COM (2008) 780, at p.3. See further SEC (2008) 2864, at p.4.

69 Commission Impact Assessment to COM (2008) 780, SEC (2008) 2865, at p.27.

70 OJ 2012 L 81/18. This regulation was accompanied by Commission Guidelines published in OJ 2012 C 115/1.

71 This directive is discussed below in section 6.3. Note that the application of this directive to buildings by lower governments is optional.

apply to larger buildings, that is, those with a floor space exceeding 500 m^2.[72] Furthermore, historical or otherwise architecturally special buildings and buildings used by the armed forces or as places of worship may be excluded. Finally, the Directive creates considerable flexibility as a result of the possibility to use excessive (that is, more than 3 per cent) renovations in any of the three previous or following years.[73] To add to the already considerable flexibility, alternatives to renovation are also enabled.[74]

Below we will study in more detail the Energy Performance of Buildings Directive (section 6.4.1), and then briefly look at how cost-effectiveness is operationalised (section 6.4.2).

6.4.1 The Energy Performance of Buildings Directive

Objective

The main objective of the Directive consists of the promotion of energy performance of buildings, taking into account local conditions, indoor climate conditions and cost-effectiveness.[75] This objective is to be attained through a common framework for the methodology to calculate the integrated energy performance and the cost-optimal level of energy performance.[76] Member States are thus required to take measures that will ensure that minimum energy performance requirements are set with a view to achieving cost-optimal levels, that is, the minimum energy efficiency required of all buildings that is efficient in relation to the investments necessary.[77] To this end, the methodology adopted on the basis of Article 3 is to be applied. Furthermore, it follows from the above that this common methodology framework respects the subsidiarity principle and allows local conditions, which will vary widely between the 27 Member States, to influence the methodology.[78] At the same time it ensures that the methodologies are sufficiently comparable in order not to jeopardise the attainment of the energy efficiency objectives of the Directive and the internal market.[79]

It also shows, just as we have seen in relation to the Energy Efficiency Directive, that the solidarity that underpins much of EU climate law has its limits, not only because of the climatic differences between Member States, but also because of the differences in energy performance

---

[72] This threshold was lowered to 250 m^2 from 9 July 2015.

[73] Articles 5(2) and (3) Energy Efficiency Directive.

[74] Article 5(6) Energy Efficiency Directive.

[75] Article 1.

[76] Article 3 Energy Performance of Buildings Directive. This framework is elaborated to some extent in Annex I to the Directive.

[77] Article 4.

[78] In a nutshell, the subsidiarity principle ensures that the EU only acts where this is more effective than national or regional action by the Member States.

[79] The internal market consists of an area with free movement of goods, services, people and capital with undistorted conditions of competition. The latter may be affected by having widely different methodologies for calculating cost-effective levels of energy efficiency.

at this moment.[80] Whereas there is a degree of solidarity inherent in the EU-wide approach, the latter's limitations in defining a methodology means that the Member States are largely free to determine their policies on a national basis. Finally, we may note that this methodology can be set at the national or the regional level.[81] Use of the latter option may complicate the implementation process, but it is standing case law that the division of powers at the national level does not affect a Member State's responsibility to ensure correct implementation.[82]

Article 5 of the Directive constitutes a major innovation in relation to the previous Directive. It contains a framework for the calculation of cost-optimal levels of minimum energy performance requirements. It envisages the adoption by the Commission of a comparative methodology and this has resulted in Delegated Regulation 244/2012.[83] Interestingly, this provision has been significantly expanded in comparison to the Commission proposal. Particularly noteworthy is the requirement for the Member States to compare the minimum energy performance standards in force with the cost-optimal levels calculated[84] and to justify such differences where they are 'significant'. This vague concept is clarified in the preamble at the level of 15 per cent.[85] However, in view of the limited legal effects of preambles to EU legislation according to the Court's standard case law, there still remains considerable uncertainty.[86]

Different types of buildings

The directive applies to buildings but also to those parts that belong to buildings, such as systems for heating, cooling and water supply (generally referred to as technical building systems).[87] In addition, the Directive differentiates between new and existing buildings, but also 'nearly zero-energy buildings'.

For new buildings, Member States, pursuant to Article 6(1), are under an obligation to take the necessary measures to ensure that new buildings meet the minimum efficiency requirements set on the basis of Article 4. Only some specific buildings are exempted from this obligation. These include buildings with special architectural or historical merit and places of worship (Article 4 para 2). In addition, the Member States are obliged to ensure that the feasibility of alternative high-efficiency systems is taken into account. Given that this feasibility involves technical, environmental and economic aspects, cost-effectiveness is again clearly pivotal to the Directive.

---

[80] For an overview see Commission Working Document on Financial Support for Energy Efficiency in Buildings, SWD (2013) 143 final, pp.6, 7.

[81] An analysis of the possible heterogeneity of transposition can be found in E. Annunziata, 'Towards Nearly Zero-Energy buildings: The State-of-Art of National Regulations in Europe' [2013] *Energy*, 125–33.

[82] For example Case C-225/96 *Commission v Italy* ECLI:EU:C:1997:584.

[83] See further below section 6.4.2.

[84] Article 5(2) Energy Performance of Buildings Directive.

[85] Recital 14 of the preamble.

[86] For example Case C-162/97 *Nilsson and Others* ECLI:EU:C:1998:554, para. 54 and Case C-136/04 *Deutsches Milch-Kontor* ECLI:EU:C:2005:716, para. 32.

[87] See Article 2 and Article 9.

The regime for existing buildings is laid down in Article 7. The Directive provides the Member States with a large degree of flexibility. This follows, among others, from the fact that the Member States shall only *encourage the consideration* of high-efficiency alternative systems, again insofar as this is technically, environmentally and economically feasible.

A major part of the energy use of buildings comes from what the Directive calls 'technical building systems'. This essentially means the heating, cooling and lighting equipment, as defined in Article 2(3) of the Directive, in the building. Article 8 has been amended quite extensively to include rules on the requirements of charging points for electrical vehicles. These reflect the obvious costs involved in these measures and the fact that not every owner or occupant will be able to fund these costs.[88] These provisions, again, clearly indicate the importance of cost-effectiveness in the scheme of the Directive.

A special category of buildings is regulated under the heading of 'nearly zero-energy buildings'. The Directive sets deadlines before which new buildings have to meet the standards for nearly zero-energy buildings. Also in line with the Energy Efficiency Directive we see that the government should lead by setting the example. This means that from 2019 onwards the new buildings owned and occupied by public authorities have to be nearly zero-energy, whereas for all other new buildings this deadline is 2021.[89] To attain this objective, plans that are part of the integrated national energy and climate plans have to be drawn up and will include, inter alia, intermediate energy efficiency targets for new buildings in 2015. Again, we see that a cost–benefit analysis is integrated into the provision and may result in the disapplication of the central obligation.[90] Interestingly, the Directive does not address the situation where a new building is partly occupied by a public authority and a commercial party before 2021. Would such a building then also have to be nearly zero-energy, or does this obligation apply only when a certain threshold is exceeded?

A recurring problem with energy efficiency is that the initial investment may be significant and recouped only over (a long) time. This especially holds true for the investments in buildings. It is further exacerbated in relation to rented housing, where the investment is undertaken by the landlord whereas the tenant reaps the benefits of a lower energy bill. To overcome these problems, Article 10 envisages a duty for the Member States to take the appropriate steps, which may include financial instruments, such as subsidy schemes.

Energy labels for buildings

Again, awareness is a major issue and to this end the Directive contains a number of provisions concerning energy performance certificates. According to the Directive, all buildings need to be awarded an energy performance certificate, often referred to as an energy label. The Directive defines the minimal amount of information that needs to be in such a certificate and the issuing of such certificates. Similar to the rules on nearly zero-energy building,

---

[88] Cf. the possibility for the Member States to exclude buildings owned and occupied by small and medium-sized enterprises from the obligation to include such charging infrastructure.

[89] Article 9(1)(a) and (b) Energy Performance of Buildings Directive.

[90] Article 9(6) Energy Performance of Buildings Directive.

stricter rules apply to public buildings.[91] In all cases, the Member States are to ensure that such certificates are handed out or made available to new tenants or buyers of a building. These certificates are to be issued by independent and accredited experts in accordance with Articles 17 and 18. In this regard it is interesting to know that the Member States are to ensure effective, proportionate and dissuasive sanctions for violations of the rights and obligations laid down in the Directive, including the obligation to present a certificate to the new owner or tenant of a building.[92]

The Directive contains a specialised inspection regime for heating and air-conditioning systems (Articles 14–16) that exceed the household scale. In this regard we note that certain heating systems may also be subject to the Directive on Industrial Emissions, which sets further and specific inspection and reporting obligations.[93]

6.4.2 Defining Cost-effectiveness

The fact that cost-effectiveness is central to the Directive, in combination with the leeway provided to the Member States in defining what exactly is cost-effective, necessitates more guidance. This follows from the fact that determining what is cost-effective may also impact general cost structures and thus undistorted conditions of competition. This is addressed by Article 5 of the Directive, which essentially enables the Commission to establish a comparative methodology framework on the basis of the steps set out in Annex III.

On the basis of this the Commission has adopted Delegated Regulation 244/2012/EU,[94] supplemented by Guidelines.[95] Both the Regulation and the Guidelines are highly technical and detailed documents that set out a methodology to be applied by the Member States that will enable them to compare, for different categories of buildings, the relative costs and benefits of various energy efficiency measures.

Beyond the energy system as a whole and buildings as major sources of energy consumption, the myriad devices and appliances that we use also consume energy and thus offer potential for energy savings.

6.5 ENERGY EFFICIENCY OF APPLIANCES

With regard to appliances, there are essentially two categories of energy efficiency-related rules. First, there are rules that regulate the actual energy efficiency of certain appliances. Second, we find rules that basically prescribe an energy labelling obligation for certain prod-

91 Article 12(1)(b) and 13(1) Energy Performance of Buildings Directive.

92 Article 27 Energy Performance of Buildings Directive.

93 Directive 2010/75 on industrial emissions replacing the Directive on Integrated Pollution Prevention and Control, OJ 2010 L 334/17. This Directive applies to industrial combustion installations with a rated thermal input exceeding 50 MW.

94 OJ [2012] L 81/8.

95 OJ [2012] C115/1.

ucts, in line with the energy performance certification for buildings. The latter category ties in with the observation, made above, that consumer awareness has a major role to play in bringing about increased energy efficiency. This awareness may result from clearer energy bills, real-time information on energy consumption and energy performance certificates for buildings. However, there are many other products and appliances that use energy, to varying degrees of efficiency.

6.5.1 Labelling Regulation

Regulation 2017/1369 (the Labelling Regulation) intends to create a clear and uniform framework to enable the potential purchaser of these products to make an informed choice taking into account energy efficiency.[96]

The Labelling Regulation replaces the Labelling Directive from 2010, which in turn replaced Directive 92/75/EC on the energy labelling of household products for the sake of clarity, as this Directive had been amended several times.[97] The Labelling Regulation not only updates the Labelling Directive to take account of technological advances, but also changes the legal instrument to a regulation in order to ensure a more level playing field in the EU.[98] The Labelling Regulation is a framework measure that confines itself to stating the basic rules and enabling the Commission to adopt delegated acts and take various implementing measures that then, for example, set the rules applicable to the labelling of specific categories of products or the rescaling of these labels.[99]

The framework character of the Labelling Regulation means that the actual rules are laid down in delegated acts. These are acts adopted by the Commission and that are binding for the entire European Union.[100] Such delegated acts have been adopted for numerous products, such as heaters, vacuum cleaners[101] and tumble driers.[102] These delegated acts will set out a basic obligation for the suppliers of the products concerned to ensure that there is an energy efficiency label. Furthermore, the layout, colours and text of the labels concerned are regulated. Most importantly, the methodology for calculating the applicable energy efficiency class is set out, as well as the boundaries for the different classes. According to Article 16 of the

---

96 OJ 2017 L 198/1.This replaces the Labelling Directive, Directive 2010/30, OJ [2010] L 153/1.

97 Recital 1 of the preamble to the Labelling Directive. Directive 92/75/EC on the indication by labelling and standard product information of the consumption of energy and other resources by household appliances was published in OJ [1992] L 297/16.

98 Recital 6 of the preamble to the Labelling Regulation.

99 Articles 10–18 Labelling Regulation.

100 See, in general, Article 290 TFEU. For a discussion see F. Amtenbrink and H. Vedder, *EU Law: A Textbook*, Eleven Publishing, 2021, p.189.

101 An indication of the level of technical detail that is involved can be seen in the appeal lodged by vacuum cleaner manufacturing company Dyson in relation to the testing of such cleaners with empty bags only: see Case T-544/13, OJ [2013] C 344/68.

102 An overview is available at: http://ec.europa.eu/energy/efficiency/labelling/doc/overview_legislation_energy_labelling_household_appliances.pdf last accessed 22 June 2021.

Regulation, such acts shall be drawn up for all products for which there is a significant potential for energy saving, where the products available have a wide range of energy efficiency and where the energy efficiency does not result in negative consequences in terms of functionality or affordability.[103] In other words: labelling shall only be required where significant energy savings are possible and where there is a choice available in terms of energy efficiency.

Energy efficiency labels

The Regulation provides for a system of energy efficiency labelling whereby the energy performance of products is categorised as being in a scale that ranges from A (most efficient) to G (least efficient). The Labelling Regulation has led to a rescaling of the existing labels. Experience with the earlier Directive has taught the legislature that the top levels of the labels tend to be overcrowded and – at times – even outperformed, leading to multiple products in the A+++ category. To avoid this, the Regulation envisages a regular rescaling of the labels to the effect that at the time of the rescaling no products qualify for the A label.[104] The idea behind this is that the regular rescaling encourages competition on innovation to increase energy efficiency and avoids the need for regular rescaling.[105] The Labelling Regulation first and foremost requires the suppliers to ensure that energy efficiency labels are attached to all products for which labelling requirements have been set on the basis of the Regulation or the delegated acts adopted on the basis of it.[106] This labelling requirement also applies to retailers, who are under the obligation to display such labels in a proper and clearly visible manner.[107] The information in the label must be correct and drawn up in accordance with the methodology laid down in the Directive and the delegated acts. The responsibility for gathering the information and drawing up the energy efficiency label rests with the supplier, who is to provide these labels free of charge to dealers.[108] Most probably in response to what is called 'Dieselgate', suppliers are now explicitly prohibited from placing on the market products for which the performance has been automatically altered to 'cheat' the energy efficiency tests.[109]

Given that such labels must be attached to products and that these products may not be marketed without the relevant energy efficiency labels, it should not come as a surprise that the Labelling Regulation contains a free movement clause. According to Article 7, the marketing of products falling under the Regulation shall not be restricted or impeded. This means that

---

[103] Article 16(2) Labelling Regulation.

[104] Article 11(8) Labelling Regulation.

[105] Recital 18 of the preamble to the Labelling Regulation.

[106] Article 3 Labelling Regulation.

[107] Article 5 Labelling Regulation. On the temporal scope of this obligation see Case C-319/13, *Udo Rätzke v S+K Handels*, ECLI:EU:C:2014:210, paras 27–41, where the Court held that the duty to display the label applies only to products dispatched into the sales chain from the date of applicability of the delegated act that sets the label for that product.

[108] Article 3(1) and (2) Labelling Regulation.

[109] Article 3(5) Labelling Regulation.

any product that complies with the Regulation and the relevant delegated act benefits from the free movement of goods.

Interestingly, the Labelling Directive required the Commission to take account of voluntary, industry-based energy efficiency measures, to avoid adopting EU-wide measures. Such industry-based initiatives are no longer relevant under the Regulation. This, together with the ban on products that automatically alter their performance during testing, appears to indicate a lower degree of trust in the industry.

EU case law

Concerning energy efficiency labelling, quite a few cases have been brought by Dyson in relation to the energy efficiency labelling of vacuum cleaners. These cases all turn on the unique bagless construction of Dyson vacuum cleaners and the fact that other vacuum cleaners will lose suction power when the bag fills up. This obviously reduces energy efficiency, raising the question to what extent the testing method laid down in the Commission delegated regulation actually corresponds to reality. After several instances, Dyson obtained a ruling from the Court to the effect that the Commission's method, which entailed measuring energy consumption with an empty bag, did not correspond to the 'actual conditions of use'.[110]As a result, the Court found that the Commission had overstepped the boundaries of the powers delegated to it by the Labelling Directive.[111] On a similar note, the Court had to rule whether the sale of a bagged vacuum cleaner with an A label that was awarded in accordance with the Labelling Directive and the delegated regulation could mislead consumers and thus constitute an unfair commercial practice. This case boils down to the question whether the EU labelling rules themselves result in misleading advertising. The Court comes to the conclusion that this is not the case.[112] It further finds that the information on the label may not be supplemented by extra information on the energy and environmental performance of the products in question if that extra information is likely to mislead customers.[113] These cases show above all the increasing importance of energy efficiency, both as a design requirement and an element of competition between manufacturers.

6.6 ENERGY EFFICIENCY OF VARIOUS OTHER PRODUCTS

The EU allows Member States to make use of a wide range of instruments to enhance the energy efficiency of products and sectors. These include the use of voluntary agreements. Additionally, pursuant to the Labelling Regulation, standards have been set for all sorts of

[110] Case C-44/16P *Dyson v Commission* ECLI:EU:C:2017:357, paras 60–68.

[111] The General Court, hearing the case when it had been referred back to it by the Court for final adjudication, came to the conclusion that the Commission had indeed overstepped the limits of the powers that had been delegated to it: Case T-544/13 RENV *Dyson v Commission* ECLI:EU:T:2018:761.

[112] Case C-632/16 *Dyson v BSH Home Appliances* ECLI:EU:C:2018:599, paras 43–46.

[113] Case C-632/16 *Dyson v BSH Home Appliances* ECLI:EU:C:2018:599, paras 56–58.

different products. In this regard we may refer to the Energy Star package concerning ICT equipment.[114] This is a voluntary scheme that enables manufacturers to place the Energy Star label on their office equipment provided that the criteria are complied with. The Energy Star label rules go beyond a mere labelling scheme as the label does not indicate the actual energy efficiency of the product, but rather imposes a singular threshold that is either complied with or not. Given that the Energy Star scheme is of US origin, its application in the EU required the signing of an international agreement that would govern cooperation on setting the standards and other practicalities involved.[115]

The signature of this agreement gave rise to a case on the correct legal basis for doing so.[116] This case centred essentially on the issue of whether such energy efficiency requirements are part of the common commercial policy or rather fall under the environmental protection heading. Applying its standard centre of gravity test, the European Court of Justice came to the conclusion that the measure was of a predominant common commercial policy nature, with the environmental effects arising only indirectly as a result of changes in purchasing and use of the equipment concerned. This case shows the essence of all energy efficiency labelling regulations in that they pursue an environmental benefit indirectly, through influencing manufacturing and purchasing, and thus market-based decisions. The Energy Star Regulation does not contain any energy efficiency criteria itself but instead provides for a framework that should enable such standards to be developed. This involves the EU Energy Star Board, the Commission and the US Environmental Protection Agency. As participation in the scheme is voluntary, there is no free movement clause as there is in the Labelling Directive.

Similar measures have been adopted for other categories of products as well, such as car tyres.[117] Of a slightly different nature is the Regulation that sets minimum emission performance standards for cars and other vehicles.[118] This works on the basis of the CO_2 efficiency of the fleet of cars sold by a given manufacturer, rather than setting specific targets for the individual cars that are marketed. This means that a manufacturer, or a group of manufacturers, must ensure that on average the cars sold by it will become more energy efficient (emit less CO_2 per kilometre) over the years. This measure has resulted in the appearance of many energy-efficient cars on the market, as manufacturers need to ensure that the total fleet of cars marketed by them meets the increased energy efficiency standard. Of course, marketing such more efficient cars is relatively easy for large manufacturers with a wide array of models, whereas the producers of more exotic, high-powered vehicles may find marketing

[114] Currently Regulation 106/2008 on a Community energy-efficiency labelling programme for office equipment, OJ [2008] L 39/1, as amended by Regulation 174/2013, OJ [2013] L 63/1, hereafter: Energy Star Regulation.

[115] The signature of this agreement was approved by means of Decision 2006/1005/EC, OJ [2006] L 381/24.

[116] Case C-281/01 *Commission v Council* ('Energy Star') ECLI:EU:C:2002:761.

[117] Regulation 1222/2009 on the labelling of tyres with respect to fuel efficiency and other essential parameters, OJ [2009] L 342/46.

[118] Regulation 443/2009 setting emission performance standards for new passenger cars as part of the Community's integrated approach to reduce CO_2 emissions from light-duty vehicles, OJ [2009] L 140/1, as amended by Commission Delegated Regulation 2018/649, OJ 2018 L 108/14.

more economic cars more challenging. This has resulted in some exceptions to the scope and the possibility of joining forces to meet the tightening efficiency objectives. Here we see that, rather than relying on market forces, the EU legislator has thus adopted – albeit with a large degree of flexibility – a more traditional regulatory approach that simply imposes a binding environmental performance requirement upon the industry.

In addition to the special rules for the automobile sector, there are energy efficiency requirements set for energy using products pursuant to the Eco-design Directive.[119] This Directive is, just like the energy-labelling rules, primarily aimed at completing the internal market by avoiding distortions of competition or restrictions on the free movement of goods as a result of diverging national rules on the eco-design of products.[120] Such eco-design rules cover a wider range of concerns than just energy use, such as the ease with which a product can be recycled; also the consumption of, inter alia, energy throughout the life cycle is an aspect of the eco-design.[121] The idea behind this Directive is that producers will design their products in a way that minimises the environmental impact, for example by saving energy.[122] This is implemented by means of Commission regulations that prescribe specific eco-design criteria for categories of products that must be complied with. For dishwashers, for example, the relevant regulation prescribes the presence of an 'eco-mode' from 1 March 2021 onwards. Moreover, manufacturers will need to meet certain (energy-)efficiency conditions with the eco-programmes on the dishwashers they market from that date onwards.[123]

Finally, we refer to the various voluntary agreements on energy efficiency that have been drawn up by the industry involved. There was such an agreement between the European car manufacturers (ACEA) and the Japan (JAMA) and Korean (KAMA) car manufacturers associations. However, the failure of those agreements to deliver results triggered the adoption of the Regulation on energy efficiency standards for cars.[124] This shows that increases in energy efficiency require a strict and binding framework for the industry to deliver. This follows from the observation already made above that in general more energy-efficient products are more advanced and thus command a higher purchasing price that will only be recouped in the longer term.[125] This in turn means that there is a market for cheap, inefficient products, the demand for which is met by industry.

The stringency of the measures required can be seen in the *CECED* case, which involved the decision by the European Washing Machines Industry Association to phase out energy-inefficient washing machines. The conditions attached to this agreement were so

---

[119] Directive 2009/125, OJ 2009 L 285/10, as amended by Directive 2012/27/EU, OJ 2012 L 315/1.

[120] Article 6 of the Eco-design Directive thus contains a free movement clause for products that comply with the rules laid down in the Directive.

[121] Eco-design Directive, Annex I, part 1.3(c).

[122] Recital 4 of the preamble to the Eco-design Directive.

[123] Commission Regulation (EU) 2019/2022 laying down eco-design requirements for household dishwashers, OJ 2019 L 315/267; these conditions are included in Annex II to that Regulation.

[124] Cf. the comments above in section 6.5 on the generally reluctant stance towards industry-based initiatives.

[125] Section 6.3.

stringent that they were considered to restrict competition within the meaning of Article 101 TFEU. However, the environmental benefits resulting from increased efficiency meant that the agreement qualified for an exemption on the basis of Article 101(3) TFEU.[126]

6.7 CONCLUSION

Despite the rationality and increasing (political) importance of investing in energy efficiency, actual increases in energy efficiency are currently insufficient. In addition, the effectiveness of most of the measures involved can be doubted. The initially higher purchasing costs of, for example, an eco-friendly washing machine will be recouped only by means of reduced energy costs in the longer term, which apparently insufficiently informs purchasing decisions. Increasing energy efficiency ultimately requires an 'enlightened consumer' who makes a rational choice for longer-term savings. It may be doubted whether regulation will change purchasing behaviour to subsequently change production decisions, triggering competition for energy efficiency. However, the *CECED* case and the Regulation on emissions performance standards for cars shows that changes in production are realistic, provided there is a strict legal framework.

These findings translate into an ultimate question on the degree of solidarity and cost-effectiveness involved in defining energy efficiency standards that may be at odds with the subsidiarity principle. An increasingly uniform definition of cost-effectiveness necessitates a Europe-wide decision on inter-state solidarity, much in line with what has been seen regarding the Effort Sharing legislation. At the same time, such a decision will impact the myriad energy-related decisions that are taken throughout the EU on a daily basis, greatly reducing national sovereignty on these matters. Perhaps in response to these national concerns, the EU has provided a more prominent place to funding schemes to enhance energy efficiency. Such schemes are less intrusive and influence the decentralised decision-making that drives much of the energy efficiency policies, and notably those relying on incentivising energy-efficient consumption.

We conclude that the effectiveness of energy efficiency measures can be doubted as a result of: (a) the non-binding nature of the national energy efficiency targets; (b) the general reluctance on the part of the Member States to submit to strict and binding energy efficiency targets with concomitant measures; and (c) the poor EU track record for increasing energy efficiency.

[126] Commission Decision 2000/475 *CECED*, OJ [2000] L 187/47. For a fuller discussion see H.H.B. Vedder, *Competition Law and Environmental Protection in Europe; Towards Sustainability?* Europa Law Publishing, 2003, pp.125 and further.

Classroom Questions

1. What are the major EU instruments to increase energy efficiency and how do these relate to each other?
2. How and why may stricter EU energy efficiency law meet with opposition from the Member States?
3. Design a more effective EU energy efficiency policy with a specific measure. How would you ensure higher degrees of energy efficiency using legal instruments?

SUGGESTED READING

Books

Schubert VSR, Pollak J and Kreutler M, Energy Policy of the European Union (Palgrave 2016).

Articles and chapters

Huhta K, 'Prioritising Energy Efficiency and Demand Side Measures over Capacity Mechanisms under EU Energy Law' (2017) 35(1) Journal of Energy & Natural Resources Law 7–24.

Roggenkamp MM, 'Regulating Energy Efficiency in the European Union' in MM Roggenkamp, KJ de Graaf and R Fleming (eds), Energy Law and the Environment (Edward Elgar Publishing 2021).

Schomerus T, 'Energy Efficiency and Energy Saving: The "First Fuel"' in M Peeters and M Eliantonio (eds), Research Handbook on EU Environmental Law (Edward Elgar Publishing 2020).

Policy documents

D-G Energy website: http://ec.europa.eu/energy/efficiency/index_en.htm.

Economidou M, Todeschi V, Bertoldi P, D'Agostino D, Zangheri P and Castellazzi L, 'Review of 50 Years of EU Energy Efficiency Policies for Buildings (2020) 225 Energy and Buildings.

Ntovantzi M et al. 'Do We Have Effective Energy Efficiency Policies for the Transport Sector? Results and Recommendations from an Analysis of the National and Sustainable Energy Action Plans (2015) ECEEE Summer Study Proceedings 895–906.