

**ENERGY EFFICIENCY:
THE EVER NEGLECTED PRIORITY OF THE EUROPEAN ENERGY STRATEGY**

EGMONT PAPER 66

**ENERGY EFFICIENCY:
THE EVER NEGLECTED PRIORITY OF
THE EUROPEAN ENERGY STRATEGY**

Tania ZGAJEWSKI



June 2014



ACADEMIA PRESS

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Info@academiapress.be www.academiapress.be

All authors write in a personal capacity.

Lay-out: proexsmaes.be

ISBN 978 90 382 ##### #
D/2014/4804/###
U #####
NUR1 754

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EXECUTIVE SUMMARY

Energy saving has been a stated policy objective of the EU since the 1970s. Presently, the 2020 target is a 20% reduction of EU energy consumption in comparison with current projections for 2020. This is one of the headline targets of the European Energy Strategy 2020 but efforts to achieve it remain slow and insufficient. The aim of this paper is to understand why this is happening.

Firstly, this paper examines the reasons why public measures promoting energy efficiency are needed and what form these measures should optimally take (§ 1). Fortunately, over the last 20 years, much research has been done into the famous ‘energy efficiency gap’ (or ‘the energy efficiency paradox’), even if more remains to be done. Multiple explanations have been given: market failures, modelling flaws and behavioural obstacles. Each encompasses many complex aspects. Several types of instruments can be adopted to encourage energy efficiency: measures guaranteeing the correct pricing of energy are preferred, followed by taxes or tradable white certificates which in turn are preferred to standards or subsidies. Information programmes are also necessary.

Secondly, the paper analyzes the evolution of the different programmes from 2000 onwards (§ 2). This reveals the extreme complexity of the subject. It deals with quite diverse topics: buildings, appliances, public sector, industry and transport. The market for energy efficiency is as diffuse as energy consumption patterns themselves. It is composed of many market actors who demand more efficient provision of energy services, and that suppliers of the necessary goods and know-how deliver this greater efficiency. Consumers in this market include individuals, businesses and governments, and market activities cover all energy-consuming sectors of the economy. Additionally, energy efficiency is the perfect example of a shared competence between the EU and the Member States. Lastly, the legal framework has steadily increased in complexity, and despite the successive energy efficiency programmes used to build this framework, it has become clear that the gap between the target and the results remains.

The paper then examines whether the 2012/27/EU Directive adopted to improve the situation could bring better results. It briefly describes the content of this framework Directive, which accompanies and implements the latest energy efficiency programme (§ 3). Although the Directive is technically complex and maintains non-binding energy efficiency targets, it certainly represents an improvement in several aspects. However, it is also saddled with a multiplicity of exemption clauses and interpretative documents (with no binding value) which weaken its provisions. Furthermore, alone, it will allow the achievement of only about 17.7% of final energy savings by 2020. The implementation process, which is essential, also remains fairly

weak. The paper also gives a glimpse of the various EU instruments for financing energy efficiency projects (§ 4). Though useful, they do not indicate a strong priority. Fourthly, the paper tries to analyze the EU's limited progress so far and gather a few suggestions for improvement. One thing seems to remain useful: targets which can be defined in various ways (§ 5).

Basically, all this indicates that the EU energy efficiency strategy has so far failed to reach its targets, lacks coherence and remains ambiguous. In the new Commission's proposals of 22 January 2014 – intended to define a new climate/energy package in the period from 2020 to 2030 – the approach to energy efficiency remains unclear. This is regrettable. Energy efficiency is the only instrument which allows the EU to reach simultaneously its three targets: sustainability, competitiveness and security. The final conclusion appears thus paradoxical. On the one hand, all existing studies indicate that the decarbonization of the EU economy will be absolutely impossible without some very serious improvements in energy efficiency. On the other hand, in reality energy efficiency has always been treated as a second zone priority. It is imperative to eliminate this contradiction.

INTRODUCTION

Energy saving has been a stated policy objective of the EU since the 1970s. It was imposed by the two oil shocks that occurred in that decade, and made energy security the paramount concern, while reduced energy use became an important element in cutting oil imports. During this period, the energy intensity of Gross National Product (GNP) substantially declined in the developed world, especially in Europe¹ and Japan. Unfortunately, this evolution slowed sharply after the reduction of oil prices during the 1980s. This experience proved, however, that it was possible to ‘delink’ economic growth and energy consumption, allowing GDP to increase without commensurate increases in energy use.

Energy savings² will be essential to the fulfilment of the EU’s multiple objectives for the coming decades: strengthening the EU’s industrial competitiveness; cutting greenhouse gas emissions and meeting international climate-change commitments; keeping a lid on the EU’s energy dependency; creating millions of jobs. Presently, the target is a 20% reduction of EU energy consumption by 2020 in comparison with projections for 2020.³ This target was repeatedly reiterated on several occasions in the past and has now become one of the headline targets of the European Energy Strategy 2020⁴.

Despite that, EU energy efficiency strategy remains ambiguous. Energy efficiency was not an element of the 2008 climate/energy package proposals. It was integrated later and this new target was not binding (unlike those for greenhouse gas reduction and renewables use). In the 2012/27/EU Directive, the target has remained non-binding. Finally, in the new Commission’s proposals of 22 January 2014 that aim to define a new climate/energy package lasting until 2030, the approach to energy efficiency remains unclear. Some things, alas, never change.

¹ For an overview of the development of energy intensity in the EU between 1974 and 1995, see *‘Energy in Europe’ 1997 – An Annual Energy Review*, European Commission, September 1997, p. 66.

² ‘Energy savings’ and ‘energy efficiency’ are often used interchangeably. There is, however, a difference between these two terms. ‘Energy efficiency’ means that we use fewer energy inputs while maintaining an equivalent level of economic activity or service. ‘Energy savings’ mean an absolute decrease of energy consumption, which can be done through increased energy efficiency, behaviour changes or even decreased economic activities. In this article, the terms are used interchangeably since the EU energy efficiency policy covers both.

In that field, the difference between the two concepts depends a lot on the consumer’s reaction. It must be seen whether the increase in efficiency provokes an increase in consumption – or none. See, for example, S. Sorrell, *The Rebound Effect: an assessment of the evidence for economy-wide energy savings from improved energy efficiency*, UK Energy Research Centre, 2007.

³ The realization of this 20% energy saving by 2020 would mean a saving of 368 million tonnes of oil equivalent (Mtoe) of primary energy in 2020 compared to a projected consumption of 1,842 Mtoe in 2020, leading to a targeted EU energy consumption of 1,474 Mtoe.

⁴ COM (2010) 639.

This is regrettable. Since 2000, the foremost problem with the EU's energy strategy has been its lack of coherence. Naturally, it is difficult to reconcile three objectives as different as sustainability, competitiveness and security. Most often what has happened is that a progress in one aspect has provoked collateral problems in another. Energy efficiency, as we are going to see, is the only instrument which allows the EU to reach simultaneously the three targets.

Of course, the issue of energy efficiency is extremely complex. Firstly, it deals with quite diverse topics: buildings, appliances, public sector, industry, transport. The market for energy efficiency is as diffuse as energy consumption patterns themselves. It is composed of many market actors who demand more efficient provision of energy services, and those that supply the necessary goods and know-how to deliver this greater efficiency. Consumers in this market include individuals, businesses and governments, and market activities cover all energy consuming sectors of the economy⁵. Second, energy efficiency is the perfect example of a shared competence between the EU and the Member States. Third, the legal framework has steadily increased in complexity. The major instruments used in that framework were the successive Energy Efficiency Plans. Despite these plans, the gap between the target and the results remains. It is thus interesting to understand why this is happening, especially when one knows that the European Environment Agency (EEA) has just confirmed in a recent report⁶ that the EU's effort to achieve the 20% energy efficiency target remains too slow and insufficient.

Firstly, this note examines the reasons why specific measures are needed (§ 1), and the evolution of the different programmes from 2000 onwards (§ 2). It also describes briefly the content of the recent framework Directive 2012/27/EU accompanying and implementing the latest plan (§ 3). It also gives a glimpse of the various EU instruments for financing energy efficiency projects (§ 4). After this, it will try to analyze the EU's limited progress so far (§ 5).⁷

Tania Zgajewski⁸

⁵ IEA, *Energy Efficiency Market Report, 2013*, p. 17.

⁶ EEA 2013 report entitled *Trends and projections in Europe 2013*, p. 11.

⁷ Research for this paper stopped at the end of February 2014.

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§ 1. WHY DO WE NEED PUBLIC MEASURES FOR ENERGY EFFICIENCY?

One preliminary question must be raised: why do the European and national authorities need to promote energy efficiency? After all, the price of energy could be considered in itself an adequate incentive. The search for efficiency could thus be adequately encouraged by the functioning of the market economy. However, as multiple experiences have repeatedly revealed, it is sadly not so simple.

In many cases, energy efficiency investments are long-term ones. Enterprises and individuals must have the proper information, the correct incentives, the means to finance. In other cases, there are regulatory barriers or conflicting interests. Additionally, there are behavioural obstacles. People are creatures of habit, and they tend to resist change (except, sometimes, in a period of crisis). Consequently, it is important to support and encourage the search for energy efficiency, in both a regular and long-term perspective, with the help of various instruments. Finally, there is frequently an underestimation of energy efficiency's benefits.

Above all, however, the incorrect pricing of energy in the EU remains the foremost factor driving the need for public measures. The need for public measures is still greater because of the persistent failure of the EU to adopt a correct carbon price. Energy use implies external collective costs. More specifically, it implies an external cost directly linked to climate change. From 1993 onwards, the EU has tried to incorporate these costs into the energy price... and it has repeatedly failed. In recent years, the EU ETS system, which was at least a partial solution, has repeatedly crashed. The price of carbon remains thus both insufficient and uncertain.

1.1. The causes of the energy efficiency gap

Efficient energy products and services can bring both private and collective (economic, environmental, social) benefits. However, they are not used as often as one might expect, even when it makes sense to do so. This phenomenon is called the 'energy efficiency gap' (or 'the energy efficiency paradox'), and has generated a growing number of comments in recent decades. The slow progress of energy-saving light bulbs provides a good, simple illustration. Though it makes economic sense to buy them, they were not easily adopted. The customer needs to make a complex evaluation of potential costs and benefits. He/she needs to pay more money upfront. Additionally, sometimes, the customer also needs to change appliances. Finally, one must still weigh the comparative advantages of owner and renter. As R. Stavins synthesizes, studies have distinguished three types of possible

explanation for the energy efficiency gap: market failures, modelling flaws and behavioural barriers.⁹

Market failure explanations encompass many aspects. *'First, various Innovation Market Failures have been posited, including: research and development (R&D) and learning-by-doing spillovers; inefficient product quality and differentiation due to market power; and inefficient introduction of new products due to consumer taste spillovers (for example, consumers becoming comfortable with a new technology). Second, another set of potential market-failure explanations for the gap may be characterized as Information Problems. These include: lack of information on the part of consumers (learning-by-using or so-called experience goods; energy prices; energy consumption of products; and available substitutes); asymmetric information (the 'lemons problem'); and split incentives and principal-agent issues (such as the frequently discussed renter/owner dichotomy).*

Third, there are Capital Market Failures and Liquidity Constraints, which may be a particularly significant issue in developing-country contexts. Fourth, there are Energy Market Failures, including various externalities (environmental, energy security, congestion, and accident risk), as well as average-cost pricing of electricity.'

Modelling flaws cover: *'A set of reasons why observed levels of diffusion of energy efficiency technologies may actually be privately optimal. First, there is the possibility of unobserved or understated adoption costs, including unaccounted for product characteristics. Second, there may be overstated benefits of adoption, due to inferior project execution relative to assumptions, and/or poor policy design. Third, an incorrect discount rate may be employed in an analysis, when the correct consumer and firm discount rates should vary with: opportunity cost of and access to capital, income, buying versus retrofitting equipment, systematic risk, option value. Fourth, there is frequently heterogeneity across end users in the benefits and costs of employing energy efficiency technologies, so that what is privately optimal on average will not be privately optimal for all. This can refer either to static (cross-sectional) heterogeneity or to dynamic (intertemporal) heterogeneity, that is, technology improvements over time, which raises two possibilities: the reality of some potential adopters being short of the frontier, and the presence of option value to waiting. Fifth and finally, there is the possibility of uncertainty (real, not informational, as above), irreversibility, and option value. This could be due to uncertainty regarding future energy prices, or can be linked with option value that arises for delaying investments that have only minimal if any salvage value.'*

Behavioural barriers are multiple and complex but among the set of potential explanations, one could find, for instance, inattentiveness to future energy savings when

⁹ R. Stavins, 'Thinking about the Energy-Efficiency Gap', 19 June 2013. (<http://www.robertstavinsblog.org/2013/06/19/thinking-about-the-energy-efficiency-gap/>).

purchasing energy-consuming products, or just simple inertia. The EEA presented a very enlightening report on this subject in 2013. It showed that modifying the consumer's daily behaviour remains a very ambitious endeavor. *'Without an appropriate frame of reference, consumers cannot know whether their consumption is excessive. Meaningful, clearly communicated and continual feedback is therefore essential for a long-lasting change in consumer behaviour. Sometimes communities can be successful in acting as incubators for positive change in social norms and behaviours, because they provide an environment where people explore those changes alongside 'connected' others: neighbours, work colleagues, people of the same faith, etc.'*¹⁰

Basically, *'There are a number of energy efficiency measures in Europe whose success depends crucially on consumers to understand the information they receive and to act upon it.'*¹¹

1.2. The energy efficiency instruments

There are a lot of measures which can encourage the development of energy efficiency. Firstly, the authorities can adopt legislative measures which guarantee the correct pricing of energy. Sometimes, *'energy prices do not reflect the true marginal social cost of energy consumption, either through environmental externalities, average-cost pricing, or national security.'*¹² Secondly, they can adopt taxes. Thirdly, they can establish standards, either voluntary or mandatory. Thirdly, they can offer subsidies. Information programmes and research aid may also be offered. These instruments present different costs and benefits¹³. As a conclusion, *'economic instruments such as taxes or tradable white certificates seem to be vastly superior to standards or subsidies. Standards may generate larger rebounds and reduce welfare compared to taxes or tradable white certificates (TWCs), and subsidies also facilitate rebounding and free-riding behaviour. Information programmes also seem to be necessary, as well as other instruments designed to correct the lack of rationality of the consumers (such as those based on libertarian paternalism, but also including*

¹⁰ EEA, *Achieving energy efficiency through behaviour change: what does it take?*, 2013, p. 20.

¹¹ EEA, *Achieving energy efficiency through behaviour change: what does it take?*, 2013, p. 44.

¹² K. Gillingham, R. Newell and K. Parmler, *Energy Efficiency Economics and Policy, Resources for the future*, 2009, p. 9.

¹³ For a presentation of the different available instruments, see P. Linares and X. Labandeira, 'Energy efficiency: economics and policy', 24 *Journal of Economic Surveys* 573–592, 585.

'Economists usually consider a price signal as the most powerful instrument for promoting energy conservation and efficiency (ECE). If energy prices do not account for externalities, or do not yield enough incentives for energy efficiency, they should be raised (through taxes, for example). (...) Taxes have fewer problems than technological standards: their costs are transparent, they are compatible with the heterogeneity of consumers, and they promote technology change by themselves. Moreover, by not reducing the effective energy price, they remove the direct rebound effect in the short term (although in the long term this will appear through the improvement in energy efficiency, and there may still be some indirect and macroeconomic rebound), and they do not allow for free riding.'

standards if necessary). Here the point to emphasize is that different policy instruments may be required to address the different market failures and barriers that prevent a larger reduction in energy demand.’¹⁴

¹⁴ Ibid., p 588.

§ 2. THE SUCCESSION OF EU ENERGY EFFICIENCY PROGRAMMES AND ACTION PLANS

In the late 1970s and early 1980s, in parallel to the programmes that Member States already had in place, a number of initiatives with varying degrees of effectiveness were undertaken at EU level. However, the Commission concluded that the different energy efficiency instruments adopted before this point had not fulfilled expectations. More effort was required from the Member States. This led, among other things, to the adoption of Council Decision 91/565/EEC¹⁵ and Council Decision 96/737/EC¹⁶ of the multi-annual SAVE programme for energy efficiency. Its aim was to improve the energy intensity of final consumption.¹⁷ Though this programme¹⁸ and the activities arising from it had an impact, it was not in itself sufficient.

To bring about changes at the scale necessary, four things were deemed necessary: better coordination between Community and Member States' measures; improvement and strengthening of existing measures; facilitation of exchanges of experience and best practices; and selection of priority areas of action. This was the outset of the adoption of a long series of action plans.

2.1. The 2000 Energy Efficiency Action Plan

In 1998, the Commission presented in a communication¹⁹ the first step towards a comprehensive strategy for energy efficiency. In 2000, the Energy Efficiency Action Plan (EEAP) was adopted by the Council²⁰. It covered the period to 2010. Many proposed actions fell into the category of voluntary measures, co-ordinated at Community level. A few legislative measures were adopted over the following years when deemed necessary. Emphasis was also placed on integrating energy efficiency

¹⁵ Council Decision 91/565/EEC of 29 October 1991 concerning the promotion of energy efficiency in the Community (SAVE PROGRAMME) (OJEU 1991, L 307/34). SA7VE means: Specific Action for Vigourous Energy efficiency.

¹⁶ Decision No 96/737/EC (OJEU 1996, L 335/50).

¹⁷ Previously, in 1986, the Council had adopted a resolution concerning new Community energy objectives, which called for a 20% improvement in energy intensity of final demand by the year 1995. See Council resolution of 16 September 1986 concerning new Community energy policy objectives for 1995 and convergence of policies of the Member States. OJ C 241, 25.09.1986.

¹⁸ If the principal focus of the Community's action has been the SAVE programme, one can add another programme which also played an important role – the JOULE-THERMIE programme launched in 1995 as a specific programme of the Fourth Framework Program for RTD.

¹⁹ Communication from the Commission: Energy efficiency in the European Community – Towards a strategy for the rational use of energy [COM(1998) 246].

²⁰ The Action Plan adopted by the Council in 2000 (Bull. EU, 12-2000, pt. 1.4.50).

into Community non-energy policy instruments (such as those related to transport or taxation or the Regional Development and Cohesion Funds). The SAVE program was maintained²¹.

2.2. The 2006 Energy Efficiency Action Plan

In 2005, the Commission opened a debate²² with a Green Paper on energy efficiency²³. This Green Paper placed energy savings at the centre of the EU's ambitions to boost competitiveness and jobs (the Lisbon strategy), in addition to reducing EU energy dependency on third countries and fighting against climate change. It also proposed the establishment of National Energy Efficiency Action Plans (NEEAPs) as a key action (among others).

The European Council endorsed the Commission's proposals in 2006²⁴. A new Energy Efficiency Action Plan (EEAP) was then proposed by the Commission the same year, promoting 20% energy saving potentials by 2020²⁵. *Of these 20%, the Action Plan had to deliver approximately 14% of energy savings by 2020.*²⁶ It was approved by the Council²⁷. The plan's running time ended in 2012. A mid-term evaluation was foreseen in 2009. It was structured around several priority areas (residential and commercial – tertiary – buildings, energy services, energy-using products, energy transformation and distribution, transport) under which a portfolio of 85 (sub-) measures were grouped. It also listed ten priority actions to be initiated immediately and implemented as soon as possible.

The *first priority* was clearly to update equipment labelling and minimum energy performance standards for appliances and other energy-using equipment on the

²¹ In February 2000, SAVE was integrated through Decision 647/2000/EC (OJEU 2000, L 79/6) into the Energy Framework Programme for action in the energy sector (period 1998–2002) adopted by Council Decision 1999/21/EC (OJEU 1999, L 7/16).

²² It should be noted that to stimulate the debate, the Commission decided to set up the European Sustainable Energy Forum. This forum, which continues to exist and which is based on the models of the Florence and Madrid forums – still used to develop consensus on how to proceed with energy market liberalization – brings together the Commission, Member States, the European Parliament, national energy regulators and representatives of European industry and NGOs. It meets twice a year. At each meeting, and in addition to this European Sustainable Energy Forum, a High Level Group on competitiveness, energy and the environment was set up by the Commission. Its first report was dated 2 June 2006. This group explicitly endorsed the 20% energy savings potential from the 2005 Green Paper on energy efficiency. Progress achieved in this regard is now assessed in the framework of the regular Strategic EU Energy Reviews (SEER).

²³ COM (2005) 265 – Doing more with less. To stimulate the debate, this document proposed a number of possible policies and measures and posed 25 questions. A summary of the answers can be found in the Commission staff working document entitled *Report on the analysis of the debate on the Green Paper on energy efficiency* – SEC(2006) 693.

²⁴ Presidency Conclusions of 23/24 March 2006. 7775/1/06 REV1 of 18.05.2006.

²⁵ COM (2006) 545. The proposed Action Plan takes into account the responses received during the public consultation on the 2005B *Green Paper on Energy Efficiency*. See *Report on the Analysis of the Consultation on the Green Paper on Energy Efficiency: Commission Staff Working Document SEC(2006) 693 of 29.05.2006*.

²⁶ SEC (2006) 1174, SEC (2006) 1175 which accompanied COM (2006) 545.

²⁷ Bull. EU, 11/2006, pt. 1.23.4.

basis of the labelling²⁸ and eco-design²⁹ directives³⁰. The *second priority* aimed to substantially reduce heat loss in buildings, as well as to extend the scope of Directive 2002/91/EC on energy performance of buildings to cover small buildings, to develop minimum performance standards applicable to new and renovated buildings and to promote 'passive' houses. The *third priority* consisted of making power generation and distribution more efficient by developing minimum binding efficiency requirements for new electricity, heating and cooling capacity lower than 20 MW and by considering, if necessary, such requirements for larger production units³¹.

The *fourth priority* concerned the transport sector, notably addressing energy efficiency and CO₂ emissions from cars to ensure the achievement of the 120 g CO₂/km target by 2012³² and to propose strengthening EU requirements for the labelling of cars to incentivize consumers and producers to choose more efficient vehicles through the amendment of Directive 1999/94/EC³³.

²⁸ This implied a revision of Directive 92/75/EEC on labelling (OJ 1992, L 297/16) to strengthen it and enlarge its scope. Directive 92/75/EEC is now replaced by Directive 2010/30/EU on the indication by labelling and standard product information of the consumption of energy and other resources by energy-related products – recast (OJ, 2010, L 153/1). Directive 2010/30/EU was amended by Directive 2012/27/EU (OJ 2012, L 315/1). An overview of the legislation on household appliance labelling can be found on the following website: http://ec.europa.eu/energy/efficiency/labelling/doc/overview_legislation_energy_labelling_household_appliances.pdf

²⁹ This implied substantial amendments to Directive 2005/32/EC, establishing a framework for the setting of ecodesign requirements for energy-using products (OJ 2005, L 191/29). Directive 2005/32/EC is now replaced by Directive 2009/125/EC, establishing a framework for the setting of ecodesign requirements for energy-using products – recast (OJ 2009, L 285/10). Directive 2009/125/EC was amended by Directive 2012/27/EU (OJ 2012, L 315/1). A consolidated version of 04.12.2012 can be found on the following website: <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CONSLEG:2009L0125:20121204:EN:PDF>. An overview of the legislation on ecodesign can be found on the following website: http://ec.europa.eu/energy/efficiency/ecodesign/doc/overview_legislation_eco-design.pdf

³⁰ Both directives were subject to evaluation via a first public consultation (from 31 August 2013 to 30 November 2013), complemented by an additional online consultation until 31 January 2014: http://ec.europa.eu/energy/efficiency/consultations/201310_evaluation_of_energy_labelling_directive_en.htm. The Commission has not published a consolidated report on the results of the consultations yet, but interesting first findings and recommendations have already been published in an January 2014 Ecofys' study (http://www.energylabelvaluation.eu/tmce/First_findings_and_recommendations_31_January_2014.pdf). This said, an evaluation of Directive 2009/125/EC was carried out in 2011. It resulted in the *Ecodesign Evaluation Report* published on 16 April 2012 (http://ec.europa.eu/enterprise/policies/sustainable-business/ecodesign/review/index_en.htm).

³¹ In addition, the development of a new regulatory framework to promote the connection of decentralized generation was announced.

³² It resulted in Regulation (EC) No 443/2009 (OJ 2009, L 140/1) modified by Commission Regulation (EU) No 397/2013 (OJ 2013, L/120/4) and more recently Regulation (EU) 333/2014 (OJ 2014, L 103/15). Regulation (EC) No 443/2009 is complemented by Regulation (EC) No 510/2011 (OJ 2011, L 145/1) to include light commercial vehicles.

³³ Consideration was also given to a European norm and international standard for maximum rolling resistance limits and labelling for road vehicle tyres, as tyres and tyre pressure can improve vehicle fuel efficiency by more than 5%. It resulted later in Regulation (CE) No 1222/2009 on the labelling of tyres with respect to fuel efficiency and other essential parameters (OJ 2009, L 342/46). To finish on transport, market-based instruments (MBIs) for the maritime sector and measures to include the aviation sector in the EU ETS were also considered, as well as the elaboration of a Green Paper on urban transport to develop alternatives to car transport. In 2012, aviation was integrated into the EU ETS, but the EU deferred the scheme's application to international aviation. By doing so, the EU wants to give time to the International Civil Aviation Organization, which agreed to develop a global MBI to address international aviation by 2016, to apply by 2020. The IMO is still discussing the design and implementation of a global MBI to address international shipping. A Green Paper toward a new culture for urban mobility and an Action Plan were published respectively in 2007 [COM(2007) 551 final] and in 2009 [COM(2009) 490].

The *fifth priority* dealt with facilitating appropriate financing of energy efficiency investments for SMEs and Energy Service Companies. The *sixth priority* aimed to boost energy efficiency within the framework of the Cohesion Policy, in particular in the new Member States. The promotion of networking between Member States and regions was also underlined to ensure financing of best practice in energy efficiency. The *seventh priority* promoted a coherent use of taxation, notably by preparing a Green Paper on indirect taxation and subsequently by reviewing Directive 2003/96/CE (called 'the Energy Tax Directive'). As regards vehicle taxation, Member States were also requested to adopt the Commission's proposal to relate taxation to CO² performance³⁴ as soon as possible.

The *eighth priority* consisted of raising efficiency awareness through education, training plans and programmes, in particular for energy managers in industry and utilities. The *ninth priority* concerned the creation of a 'covenant of mayors', bringing together in a permanent network the mayors of 20–30 of Europe's largest and most pioneering cities in order to exchange best practices. Finally, the *tenth priority* aimed to foster energy efficiency worldwide through framework agreements with key external trading partner countries (Brazil, China, India, Japan, Russia and the United States). This had to be done in collaboration with international institutions.

The most important priorities announced in this programme were of a legislative nature.

In parallel, the Energy Service Directive 2006/32/EC (ESD)³⁵, which had to be transposed in May 2008, introduced for the first time into a sector not covered by the EU ETS, an indicative energy-saving target of at least 9% for 2016, underpinned by interim targets for 2010, and obliged each Member State to prepare and submit to the Commission three NEEAPs in which they reported on their saving activities (description of national strategy and measures) in order to achieve the indicative energy savings target of at least 9%³⁶. The first NEEAP had to be submitted to the Commission not later than 30 June 2007, the second not later than 30 June 2011 and the third not later than 30 June 2014.³⁷

Valuable information of Member States' progress can be found in a 2008 Commission's communication: energy efficiency: delivering 20% target³⁸. It stressed that

³⁴ COM (2005) 261. Still awaiting a final decision.

³⁵ See consolidated version of Directive 2006/32/CE of the European Parliament and the Council of 5 April on energy end-use efficiency and energy services and repealing Council Directive 93/76/EEC (OJEU, 2006L0032—EN—11.12.2008—001.001—1), more particularly Art. 14(2). This Directive applied to energy distributors, distribution system operators, retail energy sales companies, and to all energy users except those covered by the Emission Trading Scheme. Due to its wide scope and the diversity in the Member States of the development of energy infrastructures, this Directive was implemented by Member States in very different ways.

³⁶ Defined on final energy consumption, excluding ETS sectors.

³⁷ See Art. 14(2) of Directive 2006/32/EC. The first NEEAP was assessed by SEC (2009) 889; the second one by COM (2013) 938; and the third will be assessed before 1 January 2015.

³⁸ COM (2008) 772.

only one third of the actions foreseen in the 2006 Action Plan had been completed and that there was thus a risk of not meeting the 20% energy saving target by 2020 if energy saving potentials were not being realized quickly enough. Indeed, there were strong indications that measures already adopted by the EU would only achieve energy saving of about 13% by 2020, even if properly implemented by Member States. The main obstacles to energy efficiency improvements were: the slow and incomplete implementation of existing legislation; consumers' low awareness of the benefits of energy savings; the absence of adequate structures to trigger essential investments; and insufficient qualified workers.³⁹ This 2008 communication also underlined in a more detailed way the pace of progress obtained within the EU using the energy policies and measures implemented since 1997. The latter '*contributed to improving final energy efficiency on average by 1.3% per year between 1997 and 2006. Without these gains, final energy consumption would have been 11% higher in 2006. Industry is the sector which achieved the largest energy efficiency improvement. It is 24% more energy efficient than in 1997. Energy efficiency in transport and households has improved only by 9%, i.e. 1.1% per year.*'⁴⁰

This first assessment of NEEAPs was updated in 2011⁴¹.

A public consultation on the evaluation and revision of the 2006 Action Plan was launched in 2009⁴². The results⁴³ also highlighted unsatisfactory progress. The energy-saving potentials were not being realized quickly enough and the measures adopted until that point could only achieve energy savings of about 11% by 2020 (and not 13% as mentioned above) – even if properly implemented by Member States. They also indicated that the time had come for a more targeted approach to further promote energy efficiency. The topics to be targeted were energy efficiency of buildings, access to financing, energy efficiency both on the supply and demand side for SMEs and a better use of the Structural and Cohesion Funds with regard to

³⁹ See pp. 3, 4, 6, 7 of COM (2008) 772.

⁴⁰ The 2008 communication was complemented by the presentation in 2009 of the Commission's first assessment of the NEEAPs imposed by Directive 2006/32/EC, which revealed the clear gap in several Member States between the political commitment to energy efficiency and the measures adopted or planned and the resources allocated. Many EEAPs also seemed to present a business-as-usual approach that might fall short of the target concerned. SEC(2009) 889 (see in particular pp. 48 and 49). This assessment was preceded by a partial assessment provided by the Commission on January 2008 [COM (2008) 11]. The latter was partial because only a limited number of Member States had submitted their NEEAPs. This assessment is also completed by SEC (2011) 276. See also COM (2008) 772, p. 8.

⁴¹ SEC(2011) 276.

The update added that '*All NEEAPs addressed the building sector, especially residential buildings and a number of them included measures in the tertiary, transport and industrial sectors although in some Member States measures addressing these sectors were weak or missing. Despite the importance of the transport in end-use energy consumption, strong energy saving measures addressing that sector are present only in about half of the NEEAPs. Measures to save energy in agriculture are absent from most NEEAPs.*'

⁴² See the *Background Information Paper for the public consultation on the evaluation and revision of the Action Plan for energy efficiency* [COM(2006) 545] (http://ec.europa.eu/energy/efficiency/consultations/doc/2009_08_03_eap/2009_eap_background_document.pdf)

⁴³ *Evaluation and revision of the Action Plan for energy efficiency – Report on the public consultation June–August 2009*. This document can be found on the following website: http://ec.europa.eu/energy/efficiency/action_plan/doc/final_report_of_the_public_consultation.pdf

energy efficiency projects. The Covenant of Mayors was cited as a successful policy instrument. The promotion of cogeneration and district heating planning was also considered. Finally, binding targets on energy efficiency were welcomed by a majority of stakeholders.

A new progress report on the implementation of the 2006 Energy Efficiency Action Plan was presented by the Commission in 2011.⁴⁴ Its aim was to analyze progress until the end of the third quarter of 2010. It focused on each of the ten priority actions and enumerated the measures taken and their status. According to the progress report, '*... it can be noted that the majority of the priority actions have been initiated and finalized ... and that the majority of the 85 measures proposed in the EEAP have been completed or are in the process of being finalized. ... Some aspects of the EEAP limit its overall effectiveness. Indeed, its approach of listing 85 measures led to a political reality where the Plan is often perceived as a technical document more than a strong and visible political commitment to energy efficiency and savings. ... It lacks clear objectives for the different sectors and the measures proposed are not directly interlinked. Further, the EEAP is mainly conceived as (priority) actions to be taken by the Commission, while the success of many measures depends to a large extent on their level of implementation in Member States (e.g., in the case of legislation) and the interplay with supportive measures (e.g., financing).*'

On the topic of the contribution of the EEAP towards the 20% energy-savings goal by 2020, the progress report recognized that it was a mistake at the time of the EEAP's adoption in 2006 to project that the EEAP had the potential to deliver 14% energy savings by 2020. The EEAP was not designed to achieve such a potential. It could only deliver about half of the 20% and because of this needed updating.⁴⁵

To conclude, for various reasons, the Commission has repeatedly indicated that the EU was regularly failing to deliver the promised results. Many reasons explain this phenomenon. The striking fact is the EU authorities keep repeating the same approach and still refuse, even in 2014, to establish a stronger framework.

2.3. The missing link in the 2008 Climate and Energy package

A parenthesis must be opened here. In spite of these repeated speeches about the indispensable place of energy efficiency in the 2006 Action Plan, the latter was not initially an element of the Commission's 2008 legislative proposals for a Climate and Energy package. As the present author commented at the time, it was an aberrant omission.⁴⁶ Various reasons have been given:

⁴⁴ SEC(2011) 275.

⁴⁵ SEC(2011) 275, pp. 47–48.

⁴⁶ See F. Dehousse and T. Zgajewski, with the collaboration of Karel Van Hecke, *The EU climate policy after the climate package and Copenhagen – promises and limits*, Egmont Papers No 38, 2010, spec. p. 75.

*'(1) Energy savings were placed on a separate policy cycle and were therefore out of sync with renewable energy and emissions reductions policies; (2) Powerful Member States were focused on the promotion of renewable energy, and failed to understand that energy savings would make a renewable energy target easier to meet; (3) Dependence on local and regional action for implementation made negotiators wary of agreeing EU-wide policy; (4) The energy savings community was not well-established as an effective lobby unlike the renewables community; and (5) Monitoring and reporting of existing EU energy savings policies were still at an early stage.'*⁴⁷

This was later corrected, but only in part. The 20/20/20 strategy became the 20/20/20/20 one. However, the interaction between the different targets was not properly analyzed. The assessments for energy efficiency were a lot more foggy. Contrary to the targets for the reduction of greenhouse gas emissions and the use of renewables, the energy efficiency target was not binding.

2.4. The 2009 Energy Security and Solidarity Action Plan

In 2008, the second strategic energy review was launched. It focused on the security of energy supply. The basis of its analysis lies in the growing import dependence of the EU. That was mainly why the Commission proposed adopting a new action plan, called the EU energy security and solidarity action plan (ESSA plan).⁴⁸ This ESSA plan defined priorities. Among these priorities, the improvement of energy efficiency was evoked in combination with a series of legislative revisions in view of making energy savings in key areas, such as the energy performance of buildings or energy labelling. The intensification of the implementation of the Ecodesign Directive and the promotion of cogeneration were also initiatives to be taken, as well as the creation of a 'green tax'; the increase in cohesion policy funds; the establishment of a new Sustainable Energy Financing Initiative as a joint Commission/EIB project to mobilize large-scale funding from capital markets for investments notably in energy efficiency; and the use of the Covenant of Mayors to disseminate best practices on energy use, leading to benchmarking and networking mechanisms.

In 2009, the European Council approved the ESSA plan,⁴⁹ further refined in the Council (TTE) conclusions of 19 February 2009.⁵⁰ At that occasion, the European Council invited the Commission to rapidly propose a revision of the 2006 Energy Efficiency Action Plan and, in 2011, invited the Council to promptly examine the upcoming Commission proposal.⁵¹

⁴⁷ WWF, *Re-energising Europe – Making more effective energy savings policy at EU level*, 2013, p. 28.

⁴⁸ Second Strategic Energy Review – An EU Energy Security and Solidarity Action Plan [COM/2008/0781].

⁴⁹ Presidency conclusions of 19–20 March, 2009 – Document 7880/1/09 rev. 1 of 29 April 2009.

⁵⁰ See the conclusions of the 2,924th Council meeting of transport, telecommunications and energy of 19 February 2009 – document 6670/09.

⁵¹ European Council Conclusions of 4 February 2011. Doc. EUCO 2/1/11 Rev. 1, CO EUR 2, CONCL 1 of 8 March, 2011 (in particular, p. 3).

2.5. The 2011 Energy Efficiency Action Plan

The new Energy Efficiency Action Plan⁵² (2011 EEAP) proposed by the Commission in 2011 is built upon the experiences gained with the implementation of the 2006 EEAP as well as the public consultation held in 2009.⁵³ The 2011 EEAP is pursued with other policy actions under the Europe 2020 Strategy's Flagship Initiative for a Resource Efficient Europe,⁵⁴ including the 2050 roadmap for a low-carbon economy.⁵⁵

The 2011 EEAP foresees the revision of existing, or the adoption of new, legally binding instruments, as well as the continuation or the creation of other new initiatives. It targets three sectors in particular where there is great potential for energy efficiency: the building sector, the transport sector⁵⁶ and the industry sector. It also indicates that it is crucial that the public sector leads by example and that public authorities redirect public spending towards energy efficient products, transport modes, buildings, works and services (notably by developing procurement criteria that take energy efficiency into account). The development of smart networks and smart metres is also an essential element of the plan. An assessment of the results obtained by the 2011 EEAP had to be delivered by the Commission in 2013, but nothing has been published so far.

It should be noted that the impact assessment⁵⁷ supporting the preparation of this 2011 EEAP confirmed once again that the EU's progress in reaching its 20% energy-saving target by 2020 was too slow and that if one continued with the current policies and measures in place, only a 9%⁵⁸ rather than a 20% improvement in energy efficiency would be achieved by 2020. The reasons invoked for the lack of progress are notably: (1) lack of comprehensive frameworks, poor enforcement and low level of ambition; (2) low awareness and low availability of funds to cover the initial costs; (3) low number of trained professionals (such as architects, energy auditors, builders, installers, sales assistants); (4) low uptake of new innovative technologies; (5) rebound effect which relates to behaviour and the free choice of individuals; (6) non-binding character of the energy efficiency target.⁵⁹

⁵² COM (2011) 109 final/2.

⁵³ See also the following study requested by ITRE: *EU energy efficiency policy – achievements and outlook – Study and workshop report*, 2010.

⁵⁴ COM (2011) 21.

⁵⁵ COM (2011) 112.

⁵⁶ It should be noted that, though the transport sector is mentioned in the 2011 EEAP, the latter does not deepen the issue which has been dealt with in a White Paper entitled *Roadmap to a single European transport area – Towards a competitive and resource efficient transport system* [COM (2011) 144, accompanied by SEC (2011) 391]. This document includes a set of 40 initiatives for the next decade aimed at building a competitive transport system that will increase mobility, remove major barriers in key areas and fuel growth and employment. At the same time, the proposals should dramatically reduce Europe's dependency on imported oil and achieve a 60% cut in carbon emissions in transport by 2050. For that latter perspective, see the Commission communication entitled: *Clean power for transport: A European alternative fuels strategy* [COM (2013) 17].

⁵⁷ COM (2011) 277.

⁵⁸ COM (2011) 277, p 7.

⁵⁹ It is not the case for the other two 2020 targets on GHG reductions and on renewables respectively. They are legally binding targets.

§ 3. THE ENERGY EFFICIENCY DIRECTIVE 2012/27/EU

Directive 2012/27/EU⁶⁰ is currently the most important piece of EU legislation on energy savings based on the 2011 EEAP. It replaces Directive 2006/32/EC (mentioned above), the implementation of which, according to a 2013 progress report, has resulted above all in measures targeting end use. This suggests – according to this report – that the 9% indicative target for 2016 imposed by Directive 2006/32/EC will be comfortably exceeded by most Member States.⁶¹

According to various analyses, this recent directive fails to achieve the initial purpose of reaching 20% energy savings by 2020. It is expected to result, according to estimations, in only 15% of the 20% energy efficiency savings needed by 2020. To make up for the shortfall, the 15% will be complemented by an additional 2% of savings, which could be delivered if future measures – notably related to the reduction of CO₂ emissions from road vehicles and to new standards for products such as boilers – are fully approved and implemented.⁶² The problem is that these additional measures will bring EU savings to only 17%. For that reason, the missing 3% should come from further measures proposed by the Commission, following assessment of the NEEAPs in case they reveal that Member States' efforts will be insufficient to fill the remaining gap.

The main changes introduced by the Directive are, very briefly, the following. It should be noted that most of them are accompanied by flexibility clauses that weaken them.

3.1. General framework

New non-binding national energy efficiency targets. They have to be set by Member States and notified to the Commission,⁶³ and progress reports have to be sent to the Commission annually from 2013 onward. *Flexibility:* when setting those targets, Member States may take into account national circumstances affecting primary energy consumption. The Commission will assess progress accomplished by 30 June 2014 and whether the EU is likely to achieve energy consumption of no more than **1,474 Mtoe** of primary energy and/or no more than **1,078 Mtoe** of final energy in

⁶⁰ Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing directives 2004/8/EC and 2006/32/EC (OJEU L 315/1, 14.11.2012). This Directive entered into force on 4 December 2012. This Directive has been adapted by Directive 2013/12/EU by reason of the accession of the Republic of Croatia (OJEU 2013, L 141/28).

⁶¹ COM(2013) 938 final, pp. 9–10.

⁶² See 'Debriefing Energy Efficiency Directive', Claude Turms, *Rapporteur*, 11 September 2012, which can be found on the following website: <http://www.qualenergia.it/sites/default/files/articolo-doc/Debriefing%20TURMES%20report%20-%20%20energy%20efficiency%20Directive%20-%20final.pdf>

⁶³ See targets on the following website: http://ec.europa.eu/energy/efficiency/eed/reporting_en.htm.

2020. [See Article 3(1) and (2) and Article 24(1) and (11) of the Directive]. With the accession of Croatia on 1 July 2013, these figures have been adjusted to ‘no more than **1,483 Mtoe** of primary energy and/or no more than **1,086 Mtoe** of final energy.’⁶⁴

Third NEEAPs.⁶⁵ They must be submitted to the Commission by Member States by 30 April 2014, and every three years thereafter. A template had to be provided by the Commission by 31 December 2012. [See Article 24(2) of the Directive] but was only published at the end of May 2013.⁶⁶

Financing facilities. Their establishment, or the use of existing ones, must be facilitated by Member States for energy-efficiency improvement measures. An Energy Efficiency National Fund to support national energy-efficiency initiatives is also authorized. [See Article 20(1), (2), (4) of the Directive]. The Commission assists Member States in setting up financing facilities with the aim of increasing energy efficiency and has already issued a report to indicate how financial support for energy efficiency in buildings can be improved.⁶⁷

Public bodies. As from 1 January 2014, these have to refurbish each year 3% of the total floor area of the heated and/or cooled buildings owned and occupied by their central government to drastically reduce their energy consumption. The calculation of this 3% is detailed. Some public structures are excluded. *1st flexibility*: an equivalent alternative approach to be notified to the Commission by 31 December 2013 at the latest is authorized. [See Article 5, in particular (1–2) and (5–6), of the Directive]. *2nd flexibility*: Member States may authorize that the obligation of refurbishment be fulfilled by annual contributions to the Energy Efficiency National Fund. [See Article 20(5) of the Directive]. Central governments have also to purchase only products, services and buildings with high energy-efficiency performance. [See Article 6 of the Directive].

3.2. Provisions concerning the energy sector

Energy companies. From 1 January 2014 to 31 December 2020, energy companies (distributors and/or retail energy sales companies that are designated as obligated

⁶⁴ Directive 2013/12/EU of 13 May 2013 adapting Directive 2012/27/EU on energy efficiency by reason of the accession of the Republic of Croatia (OJ 2013, L 141/28).

⁶⁵ It should be noted that the first and second NEEAPs were submitted in the wake of the 2006 Action Plan and the 2011 Action Plan.

⁶⁶ Commission implementing Decision 2013/242/EU of 22 May 2013 establishing a template for NEEAPs under Directive 2012/27/EU of the European Parliament and of the Council (OJEU 2013, L 141/48). See also SWD(2013) 180 final, which accompanies it and provides additional advice on elements to be included in the NEEAPs. Both can be found on the following website: http://ec.europa.eu/energy/efficiency/eed/need_en.htm

⁶⁷ COM(2013) 225 final.

parties) will be required to reduce consumption among ‘final consumers’ by 1.5% annually. For that purpose, Member States will set up an energy-efficiency obligation scheme. [See Article 7(1) of the Directive]. *1st flexibility*: as an alternative to setting up an energy-efficiency obligation scheme, Member States may achieve the energy-savings objective through a series of alternative measures provided that those measures meet criteria explicitly mentioned in the Directive and provided that the alternative measures are notified to the Commission by 5 December 2013. [See Article 7(9) of the Directive]. *2nd flexibility*: A quarter of the energy-savings objective can be achieved through a series of alternative measures expressly indicated in the Directive. [See Article 7(2) of the Directive]. *3rd flexibility*: Member States may provide that obligated parties can fulfill their obligations by contributing annually to the Energy Efficiency National Fund [See Article 20(6) of the Directive].

Cogeneration, heating and cooling. By 31 December 2015, Member States will have to carry out and notify to the Commission a ‘comprehensive assessment’ of the potential for the application of high-efficiency cogeneration and efficient district heating and cooling. This assessment is accompanied by a cost-benefit analysis covering their territory based on climate conditions, economic feasibility and technical suitability. In addition, the assessment must be updated and notified to the Commission every five years, subject to a request by the Commission at least one year before the due date. Exemptions for these requirements are foreseen. [See Article 14 of the Directive].

Energy transport and distribution. By 15 June 2015 at the latest, Member States will ensure that an assessment is undertaken concerning energy efficiency potentials of gas and electricity infrastructure and that concrete measures and investments are identified for the introduction of energy-efficiency improvements, with a timetable for their introduction. [See Article 15(2) of the Directive]. Incentives in the transmission and distribution tariffs that are detrimental to energy efficiency must be removed. [See Article 15(4) of the Directive].

National energy regulatory authorities. These have to take energy efficiency into account regarding their decisions on the operations of the gas and electricity infrastructure. Through the development of network tariffs and regulations incentives for electricity grid operators, they also have to make available systems services to network users permitting them to implement energy efficiency improvement measures in the context of the continuing development of smart grids. Such systems service may be determined by the system operator. National energy regulatory authorities also have to encourage demand-side resources, such as demand response, to participate alongside supply in wholesale and retail markets. [Article 15(1) of the Directive].

Certification schemes. The latter have to be introduced by 31 December 2014 for providers of energy services to ensure a high level of technical competence, where the Member State considers that the national level is insufficient. [See Article 16 of the Directive].

3.3. Provision concerning buildings renovation

Member States will establish a long-term strategy (to be updated every three years) for mobilizing investment in the renovation of the national stock of residential and commercial buildings, both public and private. The first version will be published by 30 April 2014. [See Article 4 of the Directive].

This provision supports Directive 2010/31/EU⁶⁸ (the so-called Buildings Directive), which is the main legislative instrument at EU level for improving the energy efficiency of European buildings. A key element of the Buildings Directive is its requirements regarding nearly zero-energy buildings (NZEBs),⁶⁹ which are to become the norm for all new buildings in the EU by the end of 2020. Member States must draw up national plans to increase the number of NZEBs. On the basis of these national plans, the Commission published in October 2013 a report⁷⁰ on Member States' progress.

3.4. Provisions concerning industries, SMEs and final consumers

Industry, SMEs and households. Enterprises are expected to become more aware of energy-savings possibilities. Large companies will be required by Member States to undertake energy audits by 5 December 2015 at the latest and every four years from the date of the previous audit. [See Article 8(4) of the Directive]. *Flexibility:* Large companies implementing an energy or environmental management system certified by an independent body may be exempted from the audit obligation. [Article 8(6) of the Directive]. Member States will also develop programmes to encourage SMEs to undergo energy audits, and the subsequent implementation of the recommendations from these audits. For that purpose, they also may set up support schemes for SMEs. [See Article 8(2) of the Directive]. Programmes to raise awareness among households about the benefits of such audits through appropriate advice services will also be developed by Member States. [See Article 8(3) of the Directive].

⁶⁸ Directive 2010/31/EU on the energy performance of building (recast) (OJ 2010, L153/13).

⁶⁹ To know more, see the 2014 report of the European Council for an Energy Efficient Economy (ecee) entitled *Understanding (the very European concept of) nearly zero-energy buildings. Steering through the maze #2 (revised): A guide from the European Council for an Energy Efficient Economy*, April 2014 (<http://www.ecee.org/policy-areas/Buildings/nearly-zero-energy-buildings/nZEB-maze-guide>).

⁷⁰ COM(2013) 483 final/2.

Final consumers for electricity, natural gas, district heating, district cooling and domestic hot water must be able to manage their energy consumption and time of use as a result of better information provided by competitively priced, individual smart meters, in so far as it is technically possible, reasonable and proportionate in relation to the potential energy saving, and, when such meters do not exist, by their bills. [See Article 9 and 10 of the Directive]. All bills and billing information for energy consumption have to be received by final customers free of charge. Access to their consumption data, also. [See Article 11(1) of Directive].

3.5. Next steps

The Directive must be transposed into national law by 5 June 2014. In the meantime, several interpretative notes⁷¹ renamed 'guidance notes' to address the ambiguities of the text of the Directive have been issued by the Commission.

⁷¹ Commission communication entitled Implementing the energy efficiency Directive – Commission guidance [COM(2013) 762 final. This communication is accompanied by Staff Working Documents with more detailed guidance on specific provisions of Directive 2012/27/EU [SWD(2013) 445, SWD(2013) 446, SWD(2013) 447, SWD(2013) 448, SWD(2013) 449, SWD(2013) 450 and SWD(2013) 451]. All these documents can be found on the following website: http://ec.europa.eu/energy/efficiency/eed/eed_en.htm.

§ 4. EU FINANCING

Energy efficiency is not a single market: it covers measures in a diverse range of end-user sectors, end-use equipment and technologies, and consists of very large numbers of small, dispersed projects with a dispersed range of decision-makers. If properly financed, the investment costs are paid back over short periods from energy cost savings. Yet projects with compelling economic returns remain unimplemented. A major cause for this gap, among others, is a lack of financial resources. In general, households and enterprises allocate their own financial resources for energy-saving improvements but they are limited.⁷² The difficult funding situation public authorities find themselves in is another cause. Currently public purses are quite empty in a general context of public deficit. This situation is compounded by a lack of internal resources and know-how to develop bankable projects and viable financial models.

4.1. The EU subsidies programmes

To remedy this problem, the EU has put in place several instruments to help finance energy efficiency projects. They are as follows. Launched in July 2011, the **European Energy Efficiency Fund (EEE F)**⁷³ is a public-private partnership open to investments from institutional investors (for instance, the Commission, the EIB, Cassa Depositi e prestiti SpA), professional investors (Deutsche Bank) and other well-informed investors. Its final beneficiaries are municipal, local and regional authorities as well as public or private entities acting on behalf of those authorities, such as utilities, social housing associations, energy service companies (ESCOs), etc. It is equipped with a Technical Assistance Facility whose aim is to accelerate investments. For this purpose, it supports the beneficiaries in developing their projects by providing EC grants for up to 90% of the total costs, subject to a later financing by EEE F.

The **Intelligent Energy – Europe programme II (IEE II)**,⁷⁴ managed on behalf of the Commission by the Executive Agency for Competitiveness and Innovation (EACI), ran until the end of 2013. IEE II focused on the removal of non-technological barriers in areas such as energy efficiency. Within the framework of the IEE II and with its financial support, specific assistance facilities were also created. Their aim is to help overcome the lack of technical capacity and provide project development assistance for

⁷² See the 2010 JRC report entitled *Financing energy efficiency: Forging the link between financing and project implementation*, S. Rezessi and P. Bertoldi. The report can be found on the following website: http://ec.europa.eu/energy/efficiency/doc/financing_energy_efficiency.pdf.

⁷³ <http://www.eeef.eu/> An quite recent evaluation of the eeef can be found in the Commission's *Report on the implementation of the European Energy Programme for Recovery – COM(2013) 791*, pp.11–13.

⁷⁴ http://ec.europa.eu/energy/intelligent/in-action/publications/index_en.htm. The IEE II is one of the three operational programme of the EU's Competitiveness and Innovation Framework Programme (CIP).

public authorities to prepare, mobilize and launch investment, notably in the field of energy efficiency. The objective is to generate bankable investment projects that can attract outside finance – for instance, from local banks or other financial institutions.

This is the case of the **Elena Facility**.⁷⁵ Launched in 2009 and developed in cooperation with and managed by the EIB, it provides to regional and local authorities up to 90% of eligible costs required for technical assistance related to a clearly identified investment programme in the field of – notably – energy efficiency. It also facilitates access to EIB finance or finance from another bank. This is also the case of the **MLEI-PDA**⁷⁶ managed by the EACI through annual calls for proposals. The IEE II also funded the Covenant of Mayors initiative.⁷⁷ As from 2014 onwards, the different types of activities of IEE II are supported under Horizon 2020 (see below).⁷⁸

In the period 2007–2013, **EU cohesion policy funding** increasingly focused on investments in energy efficiency (and renewables) in line with the 20% energy efficiency target. Here, under the **JESSICA initiative**⁷⁹ developed in cooperation with the EIB and the Council of Europe Development Bank, Member States are offered the possibility to invest some of their structural funds allocations in financial engineering instruments supporting urban development, notably in the field of energy efficiency. In the financing period 2014–2020, energy efficiency remains an investment priority under the EU Cohesion policy funding.⁸⁰

Finally, the **Framework Programmes for Research and Technical Development (FP7)**,⁸¹ which ran until the end of 2013, also brought support in the energy efficiency field. FP7 is now replaced by **Horizon 2020**,⁸² the new EU's programme for research and innovation with nearly €80 billion of funding available over seven years (2014–2020) – in addition to the private investment that this money will attract. Horizon 2020's first work programme, which covers the period 2014–2015,⁸³ contains three calls and one of them is related to energy efficiency (areas covered:

⁷⁵ <http://www.eib.europa.eu/products/elena/index.htm?lang=en&>. ELENA stands for European Local Energy Assistance.

⁷⁶ MLEI-PDA stands for Mobilising Local Energy Investment.

⁷⁷ http://www.conventiondesmaires.eu/index_fr.html

⁷⁸ The relevant calls for proposals 2014–2015 were published on 11 December 2013 and can be found via the research and innovation programme Horizon 2020 (simply type 'IEE' into the search facility of the Horizon 2020 calls page).

⁷⁹ JESSICA is an abbreviation for the Joint European Support for Sustainable Investment in City Areas.

⁸⁰ See Art. 4 of Regulation (EU) No 1300/2013 of 17 December 2013 on the Cohesion Fund and repealing Council Regulation (EC) No 1084/2006 (OJEU 2013, L 347/281) on the Cohesion Fund and repealing Council Regulation (EC) No 1084/2006

⁸¹ http://cordis.europa.eu/fp7/home_en.html

⁸² Regulation (EU) No 1291/2013 of 11 December 2013 establishing Horizon 2020 – the Framework Programme for Research and Innovation (2014–2020) and repealing Decision No 1982/2006/EC (OJEU 2013, L 347/104).

⁸³ It can be found on the following website: http://ec.europa.eu/research/participants/portal/desktop/en/funding/reference_docs.html#-

building and consumers; heating and cooling; industry and products; finance for sustainable energy).⁸⁴

Huge additional financing efforts will, however, be needed to meet Europe's 2050 targets. This means that other innovative financing alternatives will be necessary. For that purpose, an Energy Efficiency Financial Institutions Group (EEFIG) was set up in late 2013. It works to overcome the challenges inherent to obtaining long-term financing for energy efficiency. A first interim report has already been published in the field of buildings.⁸⁵ This report already notes 'insufficient public and private investment' in the sector at present, and warns that 'if this trend continues, then EU Member States are at risk of missing their 2020 and longer-term energy efficiency targets,' and makes various recommendations.⁸⁶

4.2. The European Court of Auditors' observations

Since 2000, the EU, through its cohesion policy funds, has spent almost €5 billion on co-financing energy efficiency measures in the Member States. In 2012, the European Court of Auditors (ECA) presented a special report entitled *Cost-effectiveness of cohesion policy investments in energy efficiency*.⁸⁷ Research was carried out in Czech Republic, Italy and Lithuania as those countries had received the highest amounts of funds. The results were rather disappointing. In these countries, only a weak percentage of the investments were used directly for the purpose of energy efficiency. Instead, project funds were essentially used for renovation and refurbishment. The average planned payback period for the investments was around 50 years (in extreme cases 150 years), which the ECA described as far too long considering the lifetime of the refurbished components and even the buildings themselves. On the basis of its observations, the ECA made a few recommendations.

The most interesting lesson from this report underlines the weakness of the general methodology followed to analyze the energy efficiency benefits of the projects concerned. The ECA recommends *'the establishment of a proper needs assessment at a programme level. Such needs assessment should assess energy consumption by*

⁸⁴ http://ec.europa.eu/research/participants/data/ref/h2020/wp/2014_2015/main/h2020-wp1415-energy_en.pdf

⁸⁵ *Energy efficiency – The first fuel of the EU economy – How to drive new finance for energy efficiency investments*, Energy Efficiency Financial Institutions Group (Part I: buildings), 2014. (http://ec.europa.eu/energy/efficiency/studies/doc/2014_fig_how_drive_finance_for_economy.pdf).

⁸⁶ *Ibid.*, p. 4. This report (p.7) also gives the following precisions: 'In 2011, global energy efficiency investments across all sectors totaled \$300bn representing a very significant and growing market opportunity for investors and business. As regards buildings, according to the Ceres 2014 report entitled *Investing in the Clean Trillion: Closing the Clean Energy Investment Gap*, the additional investment required beyond business as usual investment in buildings' energy systems to limit global temperature rises to a 2°C scenario are up to another \$300 billion per annum globally between 2010 and 2020, comparing with an overall investment in buildings of \$620 billion per annum for that period.'

⁸⁷ Report No 21/2012 *On cost-effectiveness of cohesion policy investments in energy efficiency* (http://www.eca.europa.eu/Lists/News/NEWS1301_14/NEWS1301_14_EN.PDF).

*end-use in all sectors, identify the economy's energy savings potential and establish objectives and adequate methods for evaluating the success of the energy plan. It should identify cost effective solutions in each sector.'*⁸⁸

⁸⁸ Ibid., p. 27.

§ 5. THE PERSISTENTLY WEAK RESULTS OF THE EU STRATEGY

In spite of its repeated programmes and Directive 2012/27/EU containing a number of new mechanisms, the EU keeps under-delivering in the field of energy efficiency. In 2013, this was still being repeated by the European Environmental Agency (EEA). In its October 2013 report entitled *Trends and projections in Europe 2013*, the EEA stated that energy efficiency lags behind in the EU's 20/20/20 targets and that there is a need for EU countries to take strong initiatives to redress the situation. According to this report, only four Member States (Bulgaria, Denmark, France and Germany) are making good progress. For the others, their current policies are not sufficiently developed or implemented.

A report presented in 2013 by the Energy Watch Platform offers a more detailed analysis. Based on the study of national plans and numerous experts' comments, it tries to describe what has happened. There are a few general lessons. Important structural, economic, and social barriers remain to the implementation of energy efficiency programmes. There is a need for public initiatives, and they must be long term. In that context, EU-specific directives are quite necessary. Of course, general 'programmatic' directives are useful. However, their invitations are much weakened when there are not solid norms to support them. These norms are sometimes highly technical, but nonetheless fundamental. Fortunately, a lot of these texts have been correctly recast in recent years. There is a need for a comprehensive mix of policies, both to prevent incoherencies and to improve the efficiency of the whole process. Where there are specific directives, the Member States often take very little of the national implementation measures, which is a problem.

There are also, according to this report, substantial differences between the areas of action. In the strong areas, one finds first the governance framework. Agencies have been created, are functioning, and offer a lot of expertise. What is lacking, however, is a long-term strategy incorporating the progressive revision and tightening of targets. Another strong area is the public sector, where initiatives have generally been taken. A third strong area is the buildings sector (where there remain, however, two weaknesses concerning the lack of demonstration, and especially training). Appliances are the weakest sector. There is a need for strong improvement in more or less all Member States. Industry is also weak. Here, the implementation of EU-specific directives is clearly insufficient. Finally, the transport sector generally suffers from a weakness of regulatory instruments and research support.

In synthesis, change is happening incrementally but many weak spots persist. It is highly important to take them into consideration in the drafting of national plans. Horizontally, two deficiencies are really worrying. The first one concerns the lack of

trained people in various areas. As it will be essential to intensify the efforts toward energy efficiency, this could become a very serious impediment. The second one concerns the lack of research in various areas.

In spite of this, different reports published during recent years underline the enormous long-term benefits of energy efficiency. For example, as studied by a 2013 IEEP report, '*... while energy efficiency programmes produce a significant number of 'non-energy benefits', benefits are often evaluated only on the basis of the energy savings they deliver. This is due to the fact that 'non-energy benefits' are in general not quantified also due to the methodological challenges involved. As a result cost-effective energy savings potential tend to be underestimated. In addition, one needs to note that ex-ante estimates of costs to business of environmental legislation often (though not always) exceed the ex-post estimates by a substantial margin.*'⁸⁹ One needs in fact to take into consideration the decrease of fossil fuel prices, the decrease of electricity prices, the long-term decrease of energy prices, and the investment avoided in energy infrastructure. On this basis, 'the indirect impact on energy prices will be of the same order as the direct impact of the energy savings.'⁹⁰

A revised version of the Franhofer ISI study of 2009 also heralds the greatest potential savings. '*In 2050, the overall final energy demand could be reduced by 57 percent compared to the baseline projection, with annual cost savings of about 500 billion €'05. (...) Various [EU] scenarios published recently do not take energy efficiency options properly into account as a technology option for carbon mitigation. In addition, the level of detail regarding the deployment of efficiency measures is far below the accuracy applied to the analysis of the energy supply side, particularly the power sector. A good example is the recently published EU Energy Roadmap 2050 which focuses mainly on the application of carbon-neutral electricity generation technologies and in which energy efficiency plays only a minor part: none of the scenarios analyzed meets the 20 percent efficiency target mentioned above. Moreover, all the available information on the demand side is highly aggregated which prevents a more detailed analysis of the concrete technologies and policies assumed.*'⁹¹

More fundamentally, a CEPS comparison of the most important studies realized during the last five years reveals a unanimous conclusion. All decarbonization scenarios for the EU require a strong improvement in energy efficiency. As the authors emphasize, energy efficiency is key. '*Energy efficiency plays a major role in all energy scenarios. For example, ECF (2010) estimates that cost-effective energy efficiency measures could reduce the demand for power by some 220 GW by 2050,*

⁸⁹ R. Sauter and A. Volkery, *Review of costs and benefits of energy saving*, IEEP, 2013, p. 7.

This was already underlined for example by K. Dennis, 'The Compatibility of Economic Theory and Proactive Energy Efficiency Policy', *The Electricity Journal*, Volume 19, Issue 7, August–September 2006, pp. 58–73.

⁹⁰ O. Molenbroek and K. Blok, *Saving energy: bringing down Europe energy prices for 2020 and beyond*, Ecofys, 2013, p. 4.

⁹¹ Franhofer ISI, Policy report – *Contribution of Energy Efficiency Measures to climate protection within the European Union until 2050*, 2012, p. 5 et 41.

equivalent to some 440 medium-sized coal plants, and reduce the cost of transition to a decarbonised power sector by up to 30%. The importance of energy efficiency is also highlighted by Eurelectric (2013), which projects that almost 40% of GHG emissions savings in the power sector will come from energy savings. In fact, energy efficiency is beneficial for two reasons. First, it reduces the overall demand for electricity. Second, and as a result of the first reason, it also reduces the requirement for additional low carbon electricity generating sources as Europe undergoes the SET away from fossil fuels.’⁹²

This is not, as a matter of fact, exclusive to Europe: this is a world lesson. *‘There is a reduction in CO₂ all over the world except in the Middle East. And most of this reduction was driven by energy intensity decrease.’⁹³*

‘Achieving the 80% decarbonisation objective is generally associated with a decrease in energy demand. (...) In the long term (i.e. by 2050), demand reductions are much higher and may reach up to 38% in the European Commission’s energy efficiency scenario (European Commission, 2011c). More generally, however, long-term demand reductions are projected to be in the range of 20–30% (AMPERE, 2013; European Commission, 2011c; Greenpeace, 2012b; IIASA, 2012). It is worthwhile noting that the abovementioned demand reductions will need to be achieved within the context of a growing EU economy, thus requiring an absolute decoupling of economic growth from energy demand. Energy efficiency plays a crucial role in achieving demand reductions and high energy efficiency assumptions lead to higher reductions in energy demand.’⁹⁴

In such a context, targets remain useful. They can however be defined in various ways. For some analysts, *‘the most feasible design option is to introduce binding energy savings targets for end-users at the Member State level.’⁹⁵* Others tend to prefer sectoral targets.⁹⁶

Additionally, different comments have underlined the added macroeconomic benefits that the EU could receive from a strong initiative in that field. *‘The opportunities presented by energy efficiency improvements are compelling. A new stimulus programme targeted to boosting demand for energy efficiency through providing financial incentives to improve the economics of projects and combined with regulation (including minimum standards on buildings) focused on ramping up standards will send a signal to supply chains to gear up and business to invest and create jobs. The focus on regulation will be important to ensure long-term costs to governments*

⁹² A. Berhens, C. Coulie, and J. Teusch, *The Potential Evolution of the European Energy System to 2020 and 2050*, CEPS, 2013, pp. 48–49.

⁹³ World Energy Council, *Energy Efficiency Policies – What works and what does not*, 2013, p. 13.

⁹⁴ *Ibid.*, p. 47.

⁹⁵ Ecofys/Faunhofer ISI, *Energy Savings 2020 – How to triple the impact of energy savings policies in Europe*, 2010, p. 100. Chapter seven examines the various possible designs.

⁹⁶ S. Tindale, *Delivering energy savings and efficiency*, CER, 2011, p. 3.

*are minimised, by ensuring there is a long-term tangible financial value for energy efficiency that can in time be financed solely by the private sector. Such a programme, set up to complement wider structural reforms, could provide a convincing route map to European recovery.'*⁹⁷

⁹⁷ I. Holmes and R. Mohanty, *The macroeconomic benefits of energy efficiency*, E3G, 2012, pp. 35–36.

CONCLUSION

The EU aims to reduce its primary energy use by 20% by 2020, a target which, after many debates, is not legally binding yet. Meanwhile, EU Member States are only on track for savings of around 9% according to estimates. As usual, there has been some mobilization, but it is quite limited. In fact, the sequence of events repeats quite faithfully the earlier plans. The financial crisis has obviously also played a role. Since 2008, the investment level has become the most drastic casualty of the crisis. Furthermore, the target has been defined quite conservatively, and the evaluations remain sometimes haphazard. Globally, thus, the result is not so impressive.

To improve the situation, the new energy efficiency Directive 2012/27/EU has been adopted. However, at the general level, this looks a lot like more of the same. Member States had to notify to the Commission by 30 April 2013 their new national indicative energy efficiency targets. Taken collectively, they reveal that the Member States aim to achieve only about 16.4% primary energy savings and 17.7% of final energy savings by 2020 (and not the full 20% needed to meet the EU's overall target). This first result must nevertheless be read with caution. Member States have up to now been incapable of meeting the targets that they have voluntarily set. The result should be confirmed by the Commission after a deeper analysis.⁹⁸ To these caveats one must also add the technical complexity and the ambiguities of the provisions of Directive 2012/27/EU. They had to be completed by 'interpretative' notes without binding value. The flexibility clauses given to Member States will also complicate and make more difficult the implementation of the Directive.

The strategy followed since 2000 has thus repeatedly failed to reach its targets. In particular, heavy efforts remain indispensable for buildings and transport. In the field of energy efficiency, the EU seems to suffer from a very persistent paradox. Energy efficiency is always proclaimed as a fundamental priority. It is also an instrument useful for maintaining the EU's competitiveness in industry. However, the synergy between the EU institutions and the Member States remain vague, instruments blurred, economic analysis vague, and targets non-binding.

Implementation remains a fundamental weakness. National policy makers are focused on the EU requirements and their transposition into national strategies and regulation, expecting that that implementation will just happen by itself. It should be understood that it will not happen without appropriate institutional setup and strong proactive leadership in policy implementation, i.e. without: (1) Enduring political will to implement policies in place; (2) Ensuring adequate implementing capacities; (3)

⁹⁸ Commission communication of 6 November 2013 entitled Implementing the energy efficiency Directive – Commission Guidance, p. 3.

Appropriate resources and competences supported by (4) ICT infrastructure to monitor, control and evaluate results of implemented EE measures and policies.⁹⁹

The strategy thus absolutely needs reinforcing. Energy efficiency remains the weak pillar of the global EU energy strategy when it should be its strongest. The EU's position remains difficult since it must simultaneously reach three different objectives: sustainability, competitiveness and security. Its situation can thus perfectly improve in one aspect, and deteriorate in another. Greenhouse gas reductions may be acquired at the price of less competitiveness, or renewables growth at the price of less sustainability (and possibly also competitiveness). The energy efficiency target is in fact the most efficient. Automatically, each reduction of energy consumption brings more reductions in greenhouse gas emissions, more security and more competitiveness.¹⁰⁰

It could thus be concluded that the Member States have not yet in fact acknowledged the fundamental priority of energy efficiency. Contrary to other targets of EU energy policy, energy efficiency does not provoke contradictions with other objectives. Its potential is enormous. Member States need to support more strongly the primacy of this objective. First, they need to define a correct price for energy, and especially of carbon. Without this, the benefits of energy efficiency are artificially underestimated. In this context, they could organize a slight neutral revision of the taxation regime. Consumption taxes could be progressively increased, and deductions for energy economies increased in parallel. They have to increase the intensity of public communication. Generally, it is essential to guarantee a long-term perspective to consumers and enterprises. Standards must also be progressively raised and the number of trained professionals must be increased. Information for the public must be a permanent objective, with all possible use of new ICT means. Finally, last but not least, the implementation in the Member States must be vigorously strengthened.

⁹⁹ Z. Morvaj and V. Bukarica, *Immediate challenge of combating climate change: effective implementation of energy efficiency policies, 2011*, p. 16.

¹⁰⁰ On this, see the very interesting presentation of M. Ringel, *Energy efficiency – Boosting Europe's competitiveness, eceee, 2013*.