



Third NEEAP | 2017 - 2020

FOREWORD

The third **National Renewable Energy Action Plan** (NEEAP) was drafted as part of the obligation to report to the European Commission in accordance with Article 24(2) and Annex XIV of the Energy Efficiency Directive (EED, 2012/27/EU). Every three years, as of 30 April 2014, each NEEAP must cover significant energy improvement measures and expected and/or achieved energy savings, including those in the supply, transmission and distribution of energy as well as energy end-use, in view of achieving the national energy efficiency targets referred to in Article 3(1) of the EED. Each NEEAP must be supplemented by up-to-date estimates of expected overall primary energy consumption in 2020, as well as the levels of primary energy consumption in the sectors listed in Annex XIV, Part 1 of the EED.

This NEEAP summarises the measures to be taken by 2020 to promote energy efficiency throughout the national territory of Portugal, presents the savings achieved and foreseen for the period from 2008 to 2015, together with other obligations arising from the EED and the Energy Performance of Buildings Directive (EPBD, 2010/31/EU).

It should be noted that this document has been structured according to the template recommended by the European Commission, 'C(2013) 2882 final'.

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1 INTRODUCTION

In Europe, energy efficiency has gained in significance. It is one of the pillars of the European Energy Union, alongside four others: security of supply; internal energy market; decarbonisation and research & innovation. In this context, the European commitment to energy efficiency is based on strengthening the competitiveness of businesses, their capacity to generate energy-efficient products and new technologies, as well as job creation and skills development.

The entry into force of the Paris Agreement reinforced Member States' engagement with this common objective, namely with a broader commitment to the EU's contribution to controlling greenhouse gas emissions, limiting the increase in global temperatures to within 2°C during this century (with pre-industrial age levels as the benchmark).

In response, the European Commission has been working to update and harmonise the main European policy instruments on energy efficiency. The processes of reviewing and/or updating the Directives on Energy Efficiency (with a 2030 time horizon), and the Energy Performance of Buildings (including their evaluation) and Energy Labelling (strengthening the ecodesign and energy labelling of products and equipment), have been finalised or are being finalised.

Four years since the last major redrafting of the Energy Efficiency Strategy in Portugal, through its second National Renewable Energy Action Plan (NEEAP), Council of Ministers Resolution No 20/2013 of 10 April, it is now important to assess the impact of its implementation, identify any gaps and establish new conditions so that, together with the work done since the first NEEAP, approved through Council of Ministers Resolution No 80/2008 of 20 May, the national energy efficiency targets set for 2020 can be achieved.

In this sense, it is a national objective to make energy efficiency a priority in energy policy, taking into account that to date Portugal has no endogenous fossil resources, nor enough primary energy purchases to influence market prices (price taker), and that the increase in energy efficiency promotes energy security and protection with good value for money.

In addition, Portugal has made the commitment, as regards energy efficiency, to create market conditions and change end consumer behaviour in the rational use of energy. Despite the adverse economic context, energy efficiency has been the most cost-effective means of supporting the transition to a low carbon economy and generating growth, jobs and investment opportunities. This is why energy efficiency is taken up not only as an opportunity for development and modernisation, but also as a priority energy source, in the sense that energy that is not produced or consumed is the safest, cleanest and cheapest energy.

From the start of the 2000s until 2014, there were two distinct cycles with regards to primary energy consumption in Portugal (Figure 1): an initial cycle, covering the period from 2000 to 2005, of increased consumption with an average annual growth rate (TCMA) of +1.4%, and a second cycle, in the period from 2005 to 2014, of decreased consumption in which a TCMA of -2.8% was recorded. However, in 2015, primary energy consumption rose +5.4% compared with 2014. Despite provisional data, primary energy consumption in 2015 indicates a reversal of the trend seen since 2005. Coal

and natural gas consumption is the main contributor to this increase in primary energy consumption, with increases of +22% and +16% respectively.

In terms of final energy consumption in Portugal, this has followed the trend seen in the primary energy sector, with an initial cycle of increased consumption from the period from 2000 to 2005, which saw a TCMA of +1.6%, and a second cycle of decreased consumption in the period from 2005 to 2014, which saw a TCMA of -2.8%. Provisional data for 2015 shows an increase of +1.2% in consumption compared with 2014.

Contributing to the downwards trend seen up until 2014 were, in particular, the slowdown in the economy from 2008 onwards that affected all sectors, particularly industry and services, and the adoption of energy efficiency measures under several national programmes within the scope of the NEEAP.

It should be emphasised that, broken down by sector, in 2015 the transport sector (37%) continues to be the principal energy consumer, followed by industry (31%), construction (29%); divided into domestic (16%) and service buildings (13%); and agriculture and fisheries (3%). There were no significant changes compared with the mix of consumption seen in 2005, with negative annual growth rates in the period from 2006 to 2015: transport (-2.4%), industry (-3.2%), domestic (-2.6%), services (-1.0%) and agriculture and fisheries (-1.3%).

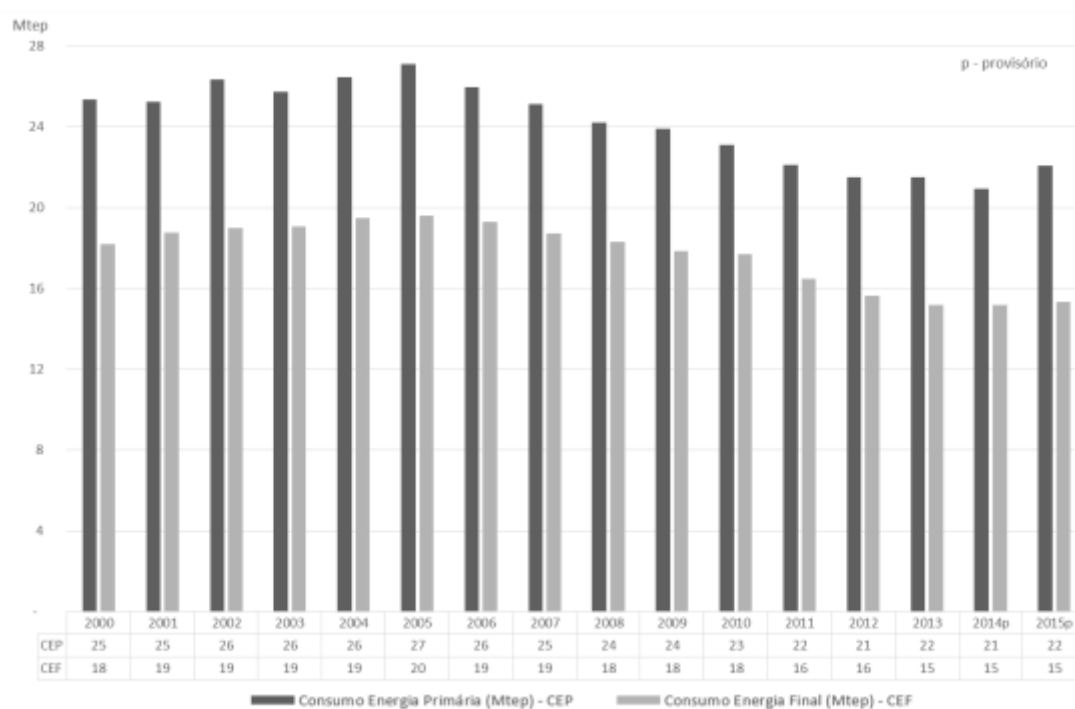


Figure 1 – Evolution of total primary and final energy consumption (Mtoe), source: Directorate-General for Energy and Geology

Key to Figure 1:

Portuguese	English
Mtep	Mtoe
Provisorio	Provisional
Consumo Energia Primaria (Mtep)	Primary Energy Consumption (Mtoe)
Consumo Energia Final (Mtep)	Final Energy Consumption (Mtoe)

2 NATIONAL OVERVIEW OF ENERGY EFFICIENCY TARGETS AND SAVINGS

2.1 National 2020 energy efficiency targets

Council of Ministers Resolution (RCM) No 20/2013 of 10 April approved a second NEEAP for the period from 2013 to 2016 (Energy Efficiency Strategy – NEEAP 2016). Following Directive 2012/27/EU of the European Parliament and of the Council of 25 of October on energy efficiency (EED, Energy Efficiency Directive), the target was set for a ceiling on primary energy consumption by 2020, based on projections of the PRIMES energy model for the European Commission in 2007, equivalent to a reduction of 20% (excluding non-energy uses).

Pursuant to Article 3.1 of the EED, the indicative national energy efficiency target for Portugal for energy consumption in 2020 should not exceed 24 Mtoe of primary energy, taking into account the fact that energy consumption in the European Union in 2020 should be no more than 1,474 Mtoe of primary energy.

2.2 Additional energy efficiency targets

Due to the sharp fall in primary energy consumption in Portugal, a more ambitious national target for 2020 was set (Figure 2), corresponding to a 25% total reduction in primary energy consumption under the provisions of Part 2.1 of Annex XIV of the EED.

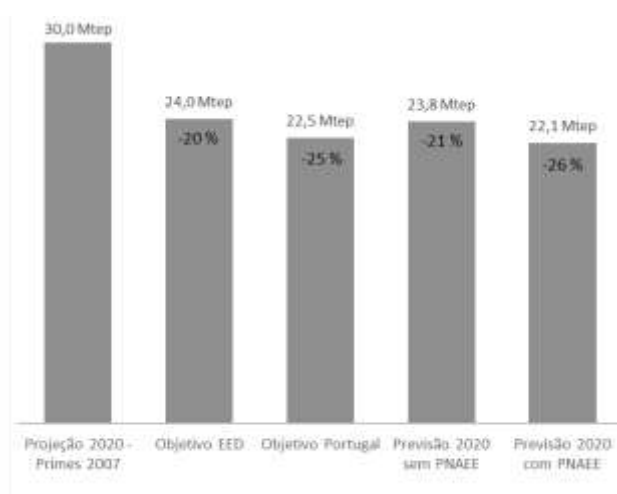


Figure 2 - Primary energy consumption predictions under the EED and NEEAP (Mtoe)

Key to Figure 2:

Portuguese	English
Projeção 2020 – Primes 2007	2020 Projection – Primes 2007
Objetivo EED	EED Target
Objetivo Portugal	Portugal Target
Previsão 2020 sem PNAEE	2020 Forecast without NEEAP
Previsão 2020 com PNAEE	2020 Forecast with NEEAP

Portugal is therefore convinced that it will be possible to successfully guarantee the 2020 additional national target, even considering the positive indicators for the country's economic recovery, which will naturally lead to a positive increase in primary energy consumption by 2020.

The third NEEAP has been prepared in this context, as the best means of predicting and planning the future, maintaining consistency with the past and present, and ensuring the impact of measures to be implemented is given the necessary consideration.

2.3 Primary energy savings

The evolution in primary energy consumption excluding non-energy uses, and including international aviation consumption (Figure 3), which serves as a benchmark for measuring the attainment of the 2020 energy efficiency target, remains below the benchmark value (24 Mtoe to ensure compliance with the 20% reduction target), and Portugal therefore complies with the planned national target of achieving primary energy consumption of less than 22.5 Mtoe by 2020 (25% of the PRIMES 2007 model projection for 2020).

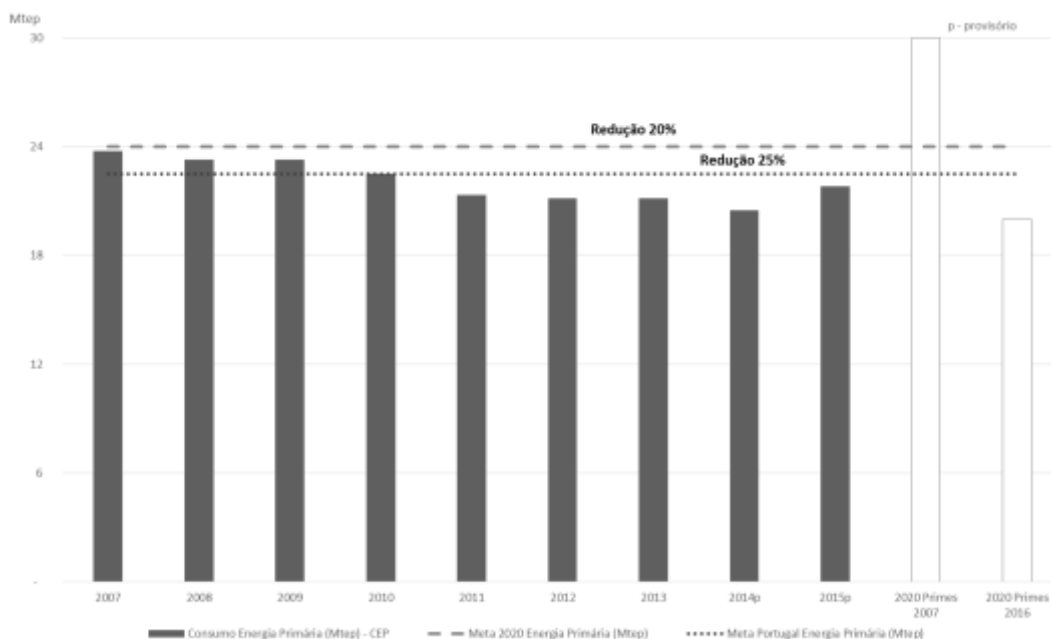


Figure 3 - Change in primary energy consumption in Portugal (excluding non-energy uses and including international aviation consumption) (2005 to 2015), source: DGEG

Key to Figure 3:

Portuguese	English
Mtep	Mtoe
Provisório	Provisional

Redução 20%	20% Reduction
Redução 25%	25% Reduction
Consumo Energia Primária (Mtep)	Primary Energy Consumption (Mtoe)
Meta 2020 Energia Primária (Mtep)	2020 Primary Energy Target (Mtoe)
Meta Portugal Energia Primária (Mtep)	Portugal Primary Energy Target (Mtoe)

Other indicators to support the increase in the rational use of energy in Portugal are changes in energy consumption in response to changes in GDP (prices for 2011) and changes in the number of inhabitants (Figure 4).

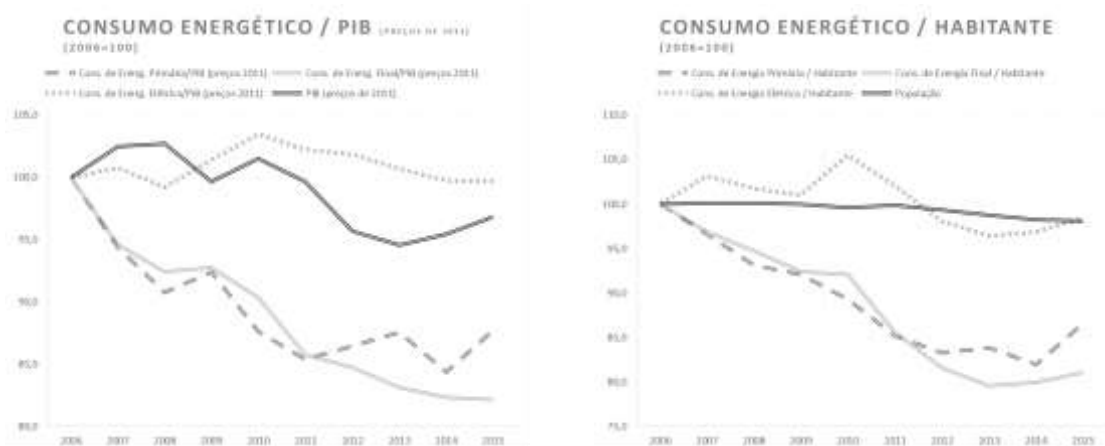


Figure 4 - Rational energy use indicators in Portugal, source: DGEG

Key to Figure 4:

Portuguese	English
CONSUMO ENERGÉTICO / PIB (PREÇOS DE 2011)	ENERGY CONSUMPTION / GDP (2011 PRICES)
Cons. De Energ. Primária/PIB (preços 2011)	Primary energy consumption/GDP (2011 prices)
Cons. De Energ. Final/PIB (preços 2011)	Final energy consumption/GDP (2011 prices)
Cons. De Energ. Elétrica/PIB (preços 2011)	Electrical energy consumption/GDP (2011 prices)
PIB (preços 2011)	GDP (2011 prices)
CONSUMO ENERGÉTICO / HABITANTE (2006=100)	ENERGY CONSUMPTION / INHABITANT (2006=100)
Cons. De Energ. Primária/Habitante	Primary energy consumption/Inhabitant
Cons. De Energ. Final/Habitante	Final energy consumption/Inhabitant
Cons. De Energ. Elétrica/Habitante	Electrical energy consumption/Inhabitant
População	Population

Implementation of the two previous NEEAPs has greatly contributed to the results achieved. Analysis of the estimated impact of the measures foreseen in the 2008 NEEAP and 2016 NEEAP has been carried out in accordance with European rules on the monitoring of energy efficiency measures and plans (*Recommendations on Measurement and verification methods in the Framework of Directive 2006/32/EU*), and is calculated according to the calculation methods used in preparing it, and in line with the redrafting of methodologies for calculating bottom-up indicators, in order to adequately identify the direct impact of each individual measure.

In the analysis carried out, the savings achieved in both plans were calculated for the period from 2008 to 2014, whereby the degree of achievement of the 2020 primary energy target is around 47% (1,130,131 toe), as shown in Table 1.

It should be noted that the measures adopted in the building sector (state, residential and service buildings) do not enable their actual achievement to be calculated, since their indicators are under evaluation.

The contribution of the transport, industry and agriculture sectors had a major impact in 2014, with a clear growth trend since the year 2011.

Table 1 – Time-based disaggregation of implementation of the NEEAP

Área		2008	2009	2010	2011	2012	2013	2014	Acumulado	Objetivo 2020	Execução
		Impactos (tep)	Impactos (tep)	Impactos (tep)	Impactos (tep)	Impactos (tep)	Impactos (tep)	Impactos (tep)	Impactos (tep)	Impactos (tep)	Impactos (tep)
Transportes	Energia final (tep)	30 691	50 634	167 252	5 656	1 384	20 458	24 995	301 070	436 815	47%
	Energia primária (tep)	30 691	50 634	167 252	5 549	1 243	19 606	22 948	297 923		
Residencial e Serviços	Energia final (tep)	30 882	62 340	172 930	60 925	45 030	38 243	8 155	418 505	1 090 072	
	Energia primária (tep)	47 066	85 232	238 003	53 905	42 529	36 809	8 134	511 738		
Indústria e Agricultura	Energia final (tep)	69 543	67 481	39 178	21 933	15 331	14 189	21 890	349 625	561 309	
	Energia primária (tep)	69 678	67 796	40 774	24 323	16 967	15 773	24 886	260 167		
Estado	Energia final (tep)	-	3 923	5 978	4 261	5 159	5 325	600	25 249	295 452	
	Energia primária (tep)	-	5 872	8 318	6 043	7 436	7 633	942	36 245		
Componentes	Energia final (tep)	-	-	21 313	-	-	-10 656	5 000	15 657	32 417	
	Energia primária (tep)	-	-	32 417	-	-	-16 208	7 849	24 058		
Total	Energia final (tep)	131 217	184 377	436 691	92 775	66 904	67 542	60 640	1 010 106	2 394 065	
	Energia primária (tep)	147 435	209 504	486 765	89 819	56 175	63 673	64 759	1 130 131		

Key to Table 1:

Portuguese	English
ÁREA	AREA
Impactos (tep)	Impact (toe)
Acumulado	Cumulative
Objetivo 2020	2020 Target
Execução	Implementation
Transportes	Transport
Residencial e Serviços	Residential and Services
Indústria e Agricultura	Industry and Agriculture
Estado	State

Comportamentos	Behaviour
Total	Total
Energia final (tep)	Final energy (toe)
Energia primária (tep)	Primary energy (toe)

Analysis of the degree of implementation of the NEEAP was based on information collected from several sources and was calculated according to the calculation methods used in the preparation of the NEEAP (Table 2).

Table 2 - Monitoring implementation of the additional measures of the NEEAP

Programas	Energia Poupada 2008-2014		Meta 2016		Grau de Execução	Meta 2020		Grau de Execução
	Energia Final (tep)	Energia Primária (tep)	Energia Final (tep)	Energia Primária (tep)	Meta 2016 (face à energia final)	Energia Final (tep)	Energia Primária (tep)	Meta 2020 (face à energia primária)
Transportes	301 070	297 923	344 038	343 683	98%	408 414	408 815	73%
Residencial e Serviços	418 505	511 738	634 265	836 277	68%	857 493	1 088 072	40%
Indústria e Agricultura	249 625	280 167	395 309	407 221	68%	511 309	561 309	50%
Estado	25 249	36 245	106 380	153 635	24%	205 425	295 452	12%
Comportamentos	15 657	24 058	21 313	32 417	73%	21 313	32 417	74%
Total	1 010 106	1 130 131	1 501 305	1 773 233	67%	2 003 954	2 394 065	40%

Key to Table 2:

Portuguese	English
Energia Poupada 2008-2014	Energy saved 2008-2014
Meta 2016	2016 Target
Grau de Execução Meta 2016 (face à energia final)	Degree of Implementation against 2016 Target (as regards final energy)
Meta 2020	2020 Target
Grau de Execução Meta 2020 (face à energia primária)	Degree of Implementation against 2020 Target (as regards primary energy)
Programas	Programs
Energia Final (tep)	Final Energy (toe)
Energia Primária (tep)	Primary Energy (toe)
Transportes	Transport
Residencial e Serviços	Residential and Services
Indústria e Agricultura	Industry and Agriculture
Estado	State
Comportamentos	Behaviour
Total	Total

It is estimated that in the years 2015 and 2016, the impact of the NEEAP measures will translate to bigger energy savings, given the implementation of various strategies, such as electric mobility, through the expansion of the rapid charging network, upgrading of the national building stock through various national and community support schemes, and national end consumer campaigns.

Other instruments that should be evaluated, given the impact of energy efficiency measures adopted at national level by end energy consumers, are the Energy Efficiency Fund and the Plan for Promoting Efficient Energy Consumption, aimed at end consumers from the different sectors.

The Energy Efficiency Fund provides direct support to 1,941 end consumers within the framework of measures to promote energy efficiency, including tangible measures with an impact of an approximately 12,120 toe reduction in final energy consumption, and intangible measures such as energy audits and consumption rationalisation plans.

The Plan for Promoting Efficient Energy Consumption (PPEC), which aims to promote measures to improve efficient electricity consumption, after implementation of the 2013-2014 edition, estimates energy savings of around 13,720 toe.

3 MEASURES FOR IMPLEMENTATION OF THE EED

3.1 Cross-cutting measures

3.1.1 Energy efficiency obligation schemes (Article 7 EED)

Decree-Law No 68-A/2015 of 30 April provides, in its Article 4, for the exclusions permitted in paragraphs a), b) and d) of Article 7(2) of the EED. In this context, Portugal has a reduction of 2.5 Mtoe of primary energy as a cumulative energy savings target by 2020.

After calculating the results for 2014, the first year of implementation of Article 7 of the EED, overall the implementation of the measures envisaged fell short of expectations, with a reduction in consumption of 46,108 toe. Consequently, alternative measures have been considered to achieve savings in energy consumption among end consumers, in order to achieve the proposed targets.

To achieve the proposed targets on an annual basis, the following measures will be adopted to strengthen market conditions for a significant increase in energy efficiency through:

- (1) Creation of a 'Local Energy Agreement' (2017-2020) bringing together local authorities (municipalities and parishes) in a joint strategy to guarantee commitments to reduce the final energy consumption of local public administration buildings annually by 1.5%.
- (2) Actively extending the promotion of energy efficiency to include the premises covered by the European emissions trading scheme provided for in Decree-Law No 93/2010 of 27 July and in Decree-Law No 38/2013 of 15 March, through the obligation to report a reduction in final energy consumption of 1.5%.

To this end, within 90 days of publication of the Council of Ministers Resolution, to which this plan will be annexed, the DGEG must submit to the minister responsible for energy two legislative proposals for implementation of the measures referred to in the previous two paragraphs.

If during implementation of the planned measures there are deviations that could jeopardise the cumulative energy savings target for 2020, additional measures will be taken. These may include further mandatory and/or fiscal measures, or other voluntary or non-voluntary measures that will increase the likelihood of achieving energy savings of 2.5 Mtoe by 2020.

It should be noted that the above measures are aimed at the end energy consumer, and therefore not at the energy supplier.

The DGEG and the Executive Committee of the NEEAP Management Structure are involved in monitoring and guaranteeing full follow-up of the results of the proposed measures. All parties involved are responsible for implementation and fulfilment, to the extent ascribed by law.

The DGEG is responsible for drafting, implementing, completing and evaluating such policy measures, and is accountable to the government minister responsible for energy.

3.1.2 Energy audits and energy management systems (Article 8 of the EED)

Since the early 80s, there has been a clear need to create conditions in the national market for high quality, cost-effective and independent energy audits by qualified and/or accredited experts according to qualification criteria.

In this context, and with the aim of guaranteeing a market of energy audits and high quality energy consumption management systems, a number of legislative mechanisms were created, supervised by the DGEG under national legislation, responding to the needs of the industry, services and residential sectors.

Likewise, for the **transport sector**, the Regulation on the Energy Consumption Management for the Transport Sector (RGCEST) was created by Order 228/90 of 27 March, which aims to improve energy efficiency in this sector. It applies to transport undertakings and undertakings with their own energy-intensive fleets whose energy consumption during the preceding year was more than 500 toe. It also sets targets for the progressive reduction of specific energy consumption.

The methodology encourages conducting an energy audit every three years, with the aim of identifying potential energy savings, underpinning the drafting of a streamlining plan with the energy efficiency improvement measures to be implemented over the following three years.

The DGEG is responsible for recognising and registering technicians, and the supervision, inspection and operational management of the RGCEST. In Table 3, the history of implementation of energy audits and consumption rationalisation plans is presented for companies registered on the RGCEST for the period from 2013 to 2016.

Table 3 - Monitoring of ongoing audits and plans under RGCEST, source: DGEG

Year	Number of audits completed/plans submitted	Number of undertakings with ongoing plans
2013	20	26
2014	28	35
2015	16	35
2016	21	28
Total	85	124

Considering the scale and size of the sector, there is a clear opportunity to create new requirements and targets for transport companies and undertakings with their own energy-intensive fleets, ensuring harmonisation of the various legal instruments in force, as well as updating and enhancing the application of legislation on energy consumption in the sector.

In the **industry sector**, the SGCIE regulation – Intensive Energy Consumption Management System – was established through publication of Decree-Law No 71/2008 of 15 April, applicable to energy-intensive premises (CIE) with consumption of over 500 toe/year, with the aim of promoting energy efficiency and monitoring the energy consumption of these premises.

To this end, energy-intensive premises are required to carry out regular energy audits to check the conditions under which energy is used, and to encourage greater energy efficiency, including the use of renewable energy sources. The energy audit focuses on the design and the condition of the premises. It must gather the input needed to draw up a plan to rationalise energy consumption, and subsequently ensure that the premises comply with the plan.

Mandatory energy audits must be carried out in accordance with DGEG Order No 17449/2008 of 27 June, which establishes the criteria for energy audits.

In late 2016, there were 1,100 premises registered on the SGCIE, of which 569 had energy consumption of 1,000 toe or above in the benchmark year of registration. The remaining 531 premises were below this threshold. A total of 1,208 energy consumption rationalisation plans (PREn) were submitted to the SGCIE by the end of 2016, resulting from implementation of the respective energy audits.

Until 31 July 2018, in order to contribute to achieving the targets proposed for 2020, Decree-Law No 71/2008 of 15 April will be revised, together with Order No 228/90, in order to update and make them more comprehensive, for example by integrating a greater number of undertakings with substantial energy consumption into the area of industry and transport

The new **SGCIE** regulation will have the following objectives:

1. To extend the scope of the current regulation to cover a greater number of premises, reducing the coverage threshold from 500 toe to 400 toe of annual consumption;
2. Introduction of a differentiating mechanism to stimulate energy savings, creating two compliance schemes, with only one of them, the most stringent, giving access to tax and other benefits;
3. Introduction, where applicable, of meters and monitoring and control mechanisms and of centralised technical management as a mandatory improvement measure;
4. Recording and monitoring of energy consumption for premises with an annual consumption of less than 400 toe;
5. Integration of premises covered by the European Emissions Trading Scheme into the SGCIE obligations;
6. Reducing the frequency of energy audits to four years;
7. Mandatory annual reporting of progress and implementation of the rationalisation plans.

The new regulation for the **transport sector** will have the following objectives:

1. Focusing application of the regulation on land transport (road, rail and inland waterways), freight and passenger transport undertakings, excluding the fleets of undertakings now considered within the scope of the SGCIE;
2. Extending the scope of the current regulation to cover a greater number of transport undertakings whose energy consumption in the previous calendar year exceeded 400 toe per year;
3. Changing the frequency of energy audits to four years.

In this way, both schemes will be aligned with the provisions of Decree-Law No 68-A/2015 of 30 April, as regards the energy audits of undertakings other than SMEs.

With regards to the **buildings sector**, two action areas are anticipated regarding the nature of the buildings, namely: i) Design of new buildings and ii) Renovation of existing buildings.

With regards to the *Design of new buildings*, the European legislative framework (Directive 2010/31/EU of the European Parliament and of the Council) requires Member States to draw up national plans to increase the number of nearly zero-energy buildings (NZEBs). The implementation of the NZEB concept, with a particular emphasis on the dates for its entry into force (1 January 2019 for public buildings and 1 January 2021 all other buildings), will guarantee that the increase in Portuguese building stock (via these new buildings) will be guided by principles of low energy consumption and promoting energy from renewable sources. Implementing this concept will rely on the creation of dedicated policies for this purpose, and on the establishment of financial support in situations where market failures are detected. Given that implementation of the NZEB concept establishes a new paradigm, the involvement of the main players affected in the construction sector will be encouraged, and establishing measures to promote adoption of this paradigm by these agents is necessary. Given the importance of the link between NZEB buildings and the quality of their construction (in order to ensure they are suitably efficient over their life cycle), there will also be support for the technical training of the various players, from the design phase of the project through to the construction phase, and ending in the usage/operation of these buildings.

With regards to the *Renovation of existing buildings*, these represent great potential for reducing energy consumption in Portugal in the buildings sector. It is felt that they should be converted according to a strategy that includes: i) the vision set out in Directive 2010/31/EU, which encourages Member States to transform all buildings that are refurbished into almost nearly zero-energy buildings (NZEB) and ii) a long-term strategy to mobilise investment in the renewal of the national stock of residential and commercial buildings, both public and private. Both aspects should seek to promote the energy retrofitting of buildings on an ongoing and regular basis, in both end consumers and in investors, through the creation of favourable conditions.

The focus of the energy retrofitting of existing buildings should be based on the following aspects:

1. Retrofitting of the passive components of buildings, seeking to implement cost-effective solutions wherever possible, leading to lower energy consumption in the life cycle of the buildings. These measures should also be based on the demand for buildings equipped with improved comfort, and reducing energy poverty;
2. The replacement of inefficient technical equipment or systems with more efficient solutions that guarantee effective energy savings. Special focus should also be given to the continuous maintenance and monitoring of these systems;
3. Promoting energy from renewable sources in order to promote greater energy independence and integration, with a reduction of energy consumption costs.

As a means of putting the two action areas referred to above into effect, the prevailing legal framework stands out. The latter will serve as a means of registering and monitoring implementation of these measures, such as the Energy Certification System for Buildings (SCE), the Regulation on the Energy Performance of Residential Buildings, and the Regulation on the Energy Performance of Commercial and Service Buildings. In the scope of the SCE, energy evaluation is carried out by experts accredited by the Portuguese Energy Agency (ADENE). Operational management and recording the issue of energy certificates by accredited experts is therefore the responsibility of ADENE, together with the registration, technical and administrative monitoring, verification and management of the quality of the activity of the SCE technicians. The DGEG is responsible for inspection of the SCE.

To obtain energy certification of the building or unit, a detailed evaluation of the energy usage conditions is performed, to identify the different energy vectors and energy consumption profile, as well as the potential for improving each of these buildings or units. In this regard, the prerequisite for each energy certificate is an energy audit of proven quality, monitored and inspected by the DGEG and ADENE. In Table 4 there is an overview of the history of the number of energy certificates/audits per type of building issued under the SCE for the period 2013-2016, and the data is displayed in the table below:

Table 4 – Monitoring of energy audits in buildings based on the number of energy certificates issued by building type under the SCE, source: ADENE

Year	Nbr of Energy Certificates			Total
	Residential Buildings	Commercial and Service Buildings – Small Buildings	Commercial and Service Buildings – Large Buildings	
2013	57,167	6,936	1,132	65,235
2014	147,823	20,809	914	169,546
2015	138,827	21,868	1,118	161,813
2016	134,645	20,941	1,148	156,734
Total	478,462	70,554	4,312	553,328

In this context, in order to identify the greatest number of opportunities for rationalising energy consumption, it is important to promote an extension of the scope of energy audits under the SCE, as provided for in national legislation, as well as promoting voluntary certification of buildings. In addition, it is essential to integrate and systematise the different monitoring and control platforms of the various existing systems (including the SCE, energy efficiency barometer etc.), with the aim of systematising audit processes, creating a useful database for end consumers, auditors and management entities.

3.1.3 Metering, Energy Billing and Billing Information (Article 9 to 11 of the EED)

In Portugal, the processes for metering and billing of electricity and natural gas consumed have undergone major changes over the years. The tariff system and the methodology for calculating tariffs stipulated in the Tariff Regulations for Energy Services Regulatory Body (ERSE) transparently promote efficiency in the allocation of funds, and fairness and equity in tariffs, without neglecting the need to maintain economic and financial equilibrium in regulated undertakings, the quality of the energy supply and the stability of the tariff changes.

In this context, Portugal has a vast network of individual energy meters which guarantee, in almost all end consumers of electricity and natural gas, precise knowledge of actual consumption and information about the corresponding actual period of use.

With the publication of Regulations 561/2014 of 22 December (Approval of the Regulation on Commercial Relations in the Electricity Sector), and 416/2016 of 29 April (Approval of the Regulation on Commercial Relations in the natural gas sector), and of Decree-Law No 68-A/2015 of 30 April, it is felt that the necessary initiatives have been taken to understand exactly how and when the end consumer uses energy, thus enabling opportunities to rationalise their consumption to be identified and managed.

The Commercial Relations Regulations aim to establish provisions relating to commercial relations between the various parties involved in the National Electricity System (SEN) and the National Natural Gas System (SNGN), as well as ensuring that energy efficiency becomes an essential pillar of the systems.

However, the absence of a breakdown of consumption and of the costs of energy per end consumer for urban heating systems and/or domestic water heating is a weakness in the fulfilment of national energy efficiency targets, and shows the pressing need to reinforce the provisions of Article 16(4) of Section V of Decree-Law No 68-A/2015 of 30 April. Responsibility for inspection and setting fines should be formally assumed by the minister for energy within 30 days of the date of publication of this Plan.

In anticipation of the growth in smart grids and their benefits, Order No 231/2013 of 22 July was published, approving the technical and functional requirements of smart meters, together with the rules on the provision of information and billing, and the financing of installation costs, pursuant to the provisions of paragraphs 4 and 5 of Article 78.-A of Decree-Law No 29/2006 of 15 February, as amended by Decree-Laws No 104/2010 of 29 September, No 78/2011 of 20 June, No 75/2012 of 26 March, No 112/2012 of 23 May and No 215-A/2012 of 8 October, the latter leading to its republication.

The same Order also establishes an economic evaluation every two years of the costs and benefits of installing smart meters, based on which the implementation of new smart meters will be approved, including the respective installation schedule. This guarantees the penetration of smart meters in the national market, thus promoting energy efficiency in end consumers through network management.

With regards to the information that should be included in energy bills in order to promote energy efficiency in end consumers, this should be increased in order to guarantee the end consumer the possibility of comparing their current actual consumption with actual consumption in previous years under identical climatic conditions. In this context, the Logistics Operator for Change of Supplier (OLMC) was established through Decree-Law No 38/2017 of 31 March, with the responsibility of 'ensuring that a change of electricity and natural gas supplier by the end consumer is carried out quickly, based on simple, transparent, standardised and electronic rules and procedures, as well as ensuring that consumers' right to information can be exercised.'

3.1.4 Consumer information programmes and training (Articles 12 and 17 of the EED)

Articles 12 and 17, and Annex XIV, of the EED refer to the obligation to provide and encourage the creation of information campaigns, training and awareness initiatives in the field of energy savings and efficiency.

Under previous NEEAPs, which entailed the delivery of several campaigns and training programmes to promote energy efficiency, the results have been difficult to monitor and quantify due to their intangible features. However, their implementation is recognised as an essential measure of direct influence on behavioural changes in end energy consumers, making a significant contribution to achieving national energy efficiency targets.

This emphasises the need to implement new campaigns and programmes, as a way to enhance and supplement in parallel with other specific measures in this NEEAP. The aim of the campaigns will be to induce behavioural changes in end consumers of energy, to adopt good energy efficiency practices in the following areas:

- a) Energy efficiency in buildings (under the SCE);
- b) Efficient equipment (under the SEEP);
- c) Efficient public procurement (under the green public procurement office);
- d) High-yield generation;
- e) Energy monitoring systems (under ISO 50001).

The following entities are therefore responsible for creating information campaigns regarding the respective scope of intervention:

- f) Transport area: IMT – Instituto da Mobilidade e dos Transportes, I.P. (Institute for Mobility and Transport, public enterprise) (IMT);
- g) Residential and services area: ADENE - Portuguese Energy Agency;
- h) Industry area: Directorate-General for Energy and Geology (DGEG);
- i) State area: Entidade de Serviços Partilhados da Administração Pública, I.P. (Entity for Shared Services of Public Administration, public enterprise) (eSPap);
- j) Behaviours area: ADENE;

These information campaigns must be included annually in the Activity Plan of each of the entities referred to, and the timetable and proposed targets should be presented to the minister responsible for energy.

The same entities should, by 31 March of each year, notify the Executive Committee of the NEEAP Management Structure of the expected and achieved results in estimated final and primary energy savings (toe), with annual implementation of the relevant information campaigns.

3.1.5 Qualification, Accreditation and Certification schemes (Article 16 of the EED)

As mentioned in paragraph 3.1.2, Portugal has in place several mechanisms for the registration and control of qualified technicians conducting energy audits, in accordance with the Regulation on Energy Consumption Management for the Transport Sector (RGCEST), in the Intensive Energy Consumption Management System (SGCIE), and in the Energy Certification System for Buildings (SCE), meaning the technical competencies, objectivity and reliability of the technicians who conduct the energy audits are already at a high standard.

In addition, many public sector undertakings and entities, due to energy challenges and a highly competitive economic context, have developed and implemented systems and processes aimed at improving energy efficiency. In this framework, many certifying and training entities have made positive efforts in the national market, with continuous training aimed at senior technical staff in Energy Management Systems (e.g.: ISO 50001). The training entities are regulated by a certification system that is part of the quality policy of the training entities' services.

Energy audits conducted under the RGCEST and SGCIE are carried out by technicians duly accredited by DGEG, and registered on the country's relevant professional engineering associations.

Under the SCE, energy audits prior to issuing the energy certificate are carried out by experts accredited by ADENE. These experts are architects, civil engineers, civil technical engineers, mechanical engineers, mechanical technical engineers, electrical engineers, technical energy and power systems engineers, specialists in air conditioning or energy engineering, registered with their respective professional public associations. They must have five years of professional experience in building construction or design, and a pass in an examination set by ADENE as a managing entity of SCE, the content of which is stated in Order No 66/2014 of 12 March.

For carrying out high quality energy audits that are duly supervised by the DGEG and ADENE, in 2016 there were 50 technicians accredited under the RGCEST, 280 technicians under the SGCIE and 1,767 experts accredited under the SCE.

3.1.6 Energy Services (Article 18 of the EED)

Through Council of Ministers Resolution No 2/2011 of 12 January, the Energy-Efficient Public Administration Programme (Eco.AP) introduced a series of energy efficiency measures for short, medium and long-term delivery in services, organisations and public equipment, with a view to changing behaviour and promoting rational management of energy services, namely by contracting energy services enterprises (ESE). The ESE provide energy services and other energy efficiency improving measures at a user's premises, assuming a degree of financial risk, whereby their remuneration for the services provided is wholly or partly based on the degree of achievement of energy efficiency improvements, and on satisfying other energy efficiency criteria that may be contractually set through an energy performance contract (CDE). Decree-Law No 29/2011 of 28 February establishes exactly how these contracts should be conducted between the Public Administration and the ESEs, thus opening the doors to the national energy services market, whose list of registered undertakings¹ is available on the DGEG's official electronic portal. In effect, Regulatory Order No 15/2012 of 26 June formalised the Regulation on the Accreditation System for Energy Services Enterprises (SQESE), differentiating two levels of accreditation for ESEs by meeting certain requirements (level 1 for buildings or equipment with annual energy consumption of ≤ 3 GWh, and level 2 for the remainder).

Such criteria are defined in a clear and transparent manner, enabling the development of a robust energy services market. Following implementation of the contracts, Order No 60/2013 of 23 January approved the standard specifications for procedures for the conclusion of energy efficiency management contracts.

¹ <http://www.dgeg.pt/?cn=83098476AAAAAAAAAAAAAAAA>

Despite regulatory efforts, the energy services market has not developed as hoped. In the public sector, the defined specifications are even seen as a barrier to concluding energy performance contracts, since liability falls on the ESEs, and there are even penalties added in the event of non-compliance with the savings guarantee. Under the Eco.AP programme, the quintessential driver of growth of the energy services market in the public sector, there were around ten contracts with an investment of around twenty million euros, all of which in the field of lighting (public and traffic lights). In the private sector, despite greater freedom in the business model, namely the possibility of sharing the financial risk agreed between the parties (ESE and beneficiary), there is no control over principal significant activity.

In order to achieve national targets, there will be information sessions, as well as awareness and communication activities around the energy services market, with working sessions on the contracting process, how the ESEs and energy services operate, focusing in particular on financing mechanisms, the DGEG being responsible for their delivery, with a minimum quarterly frequency, and whenever possible involving the energy service enterprises in partnership with other players (namely energy agencies and associations). Synergies with European and/or national projects with common objectives should be considered, boosting the involvement and participation of stakeholders. These initiatives should be coordinated with the Energy Efficiency Awareness Campaign together with the Central Public Administration, supported by PO SEUR and to be implemented by ADENE in 2017-2018.

3.1.7 Energy Efficiency National Fund, Financing Sources (Article 20 of the EED)

The Energy Efficiency Fund is an autonomous asset with no legal personality, established by Decree-Law No 50/2010 of 20 May, as amended by law No 82-D/2014 of 31 December, to finance programmes that demonstrably contribute to energy efficiency.

The Fund fulfils its financing objectives by supporting (i) projects of a predominantly technological nature in the transport, residential and services, industry, agriculture and public sector areas, and (ii) cross-sector initiatives that encourage energy efficiency in the behaviour, taxation, incentives and financing areas.

In addition, in a macroeconomic scenario beset with budget restrictions and limitations on the use of financing, in addition to the Energy Efficiency Fund, financial support is provided for energy efficiency programmes such as:

- (1) The Innovation Support Fund (FAI), established by Order No 32276-A/2008 of 17 December 2008, which also approved its Management Regulations, subsequently amended by Order No 13415/2010 of 19 August 2010, and by Order of the Secretary of State for Energy of 5 July 2012, which broadened the scope of application of the FAI to projects investing in energy efficiency;
- (2) Plan for promoting efficient energy consumption (PPEC), promoted by the Regulatory Body for Energy Services (ERSE);
- (3) Partnership agreement between Portugal and the European Commission, bringing together the 5 European Structural and Investment Funds – ERDF, Cohesion Fund, ESF, EAFRD and EMFF – which define the programming principles under which economic, social and regional development policy to be promoted in Portugal between 2014 and 2020 is delivered.

The DGEG plays a very important role in the coordinated use of the different financing instruments referred to above, and proper coordination with the respective managing entities is essential.

3.2 Energy Efficiency in Buildings

3.2.1 National Strategy for Building Renovation (Article 14 of the EED)

In Portugal, built-up area corresponds to around 452,000,000 m², of which 77% is made up of residential buildings. Commercial and service buildings can be broken down as follows: Offices: 26%; Schools: 21%; Hospitals: 7%; Hotels and Restaurants: 13%; Sports buildings: 4%; Commerce: 28%, Other 2%.

After a detailed and careful profiling of the national building stock, its dynamics and broad trends, it was possible to establish the National Strategy for Building Renovation in August 2014. The new version of the strategy to consolidate the work completed so far is being finalised.

In addition, it is essential to implement and support measures aimed at capturing the savings made through the implementation and application of energy efficiency measures in buildings, to ensure they are monitored.

3.3 Energy Efficiency in Public Buildings.

In the public sector, the programmes and measures referred to in the NEEAP should be strengthened in order to achieve targets. The Programme to Promote Energy Efficiency in Public Administration (Eco.Ap) is expected to be revamped through a review of Council of Ministers Resolution No 2/2011 of 12 January, with the following action areas:

- (1) Diversification of the mechanisms to support implementation of energy efficiency projects in public administration, ensuring interlinking between sources of financing available and the overall calculation of savings generated under Eco.Ap;
- (2) Revamp of the Energy Efficiency Barometer, making it a central instrument of energy efficiency policy, as well as a tool for managing the energy consumption of public entities;
- (3) Promotion of the use of Energy Efficiency Management Contracts by Public Administration entities, in particular by taking advantage of the potential replicating effect of interventions in public lighting systems;
- (4) Development of a new instrument to support implementation of energy efficiency measures and renewable energies in the public sector, suited to the characteristics and constraints of this sector as regards financing investments of this kind;
- (5) Development of a training programme for Local Energy Managers in order to train local energy managers to identify and implement energy efficiency measures.

In this context, and for the purposes of better implementation of the Energy Efficiency Barometer, as mentioned in paragraph (2), the following are envisaged:

- a) Periodic reporting by energy suppliers of the energy consumption and costs of Public Administration entities, preferably via electronic platform;

- b) Periodic reporting by Public Administration entities of the characteristics of their buildings, activities, contracts and energy consumption, preferably via electronic platform;
- c) Integration and sharing of information with other databases, namely the State Property Information System (SIIE) and the Building Energy Certification system (SCE).

3.4 Other energy efficiency measures

With a view to achieving the 2020 energy consumption efficiency targets, and to complement the cross-cutting measures referred to above, as well as the programmes and general action points set out in the 2016 NEEAP, action on less efficient technologies will be strengthened through the application of additional charges on products and equipment. Through the energy labelling of white goods, air conditioning systems, sanitary water heating, lighting, tyres etc., a taxation value will be developed that is proportional to the product's inefficiency. In this sense, within 90 days the DGEG should establish and submit to the minister responsible for energy the review of Decree-Law No 70/2016 of 3 October (regarding the energy efficiency labelling of tyres and other essential parameters), Decree-Law No 108/2007 of 12 April (establishing a duty on low energy efficiency light bulbs) and Decree-Law No 63/2011 of 9 May (establishing information measures to be provided to the end user through labelling, and other indications on energy consumption, transposing Directive No 2010/30/EU of the European Parliament and of the Council of 19 May).

The total duties applied will be paid into the Energy Efficiency Fund, strengthening the allocation available for financing energy efficiency measures in the various sectors.

In addition, the incentive to choose the most energy-efficient solutions from the range of products, equipment and systems that, while not subject to European energy labelling, have strong energy saving potential, will be strengthened through the adoption of voluntary labelling systems (e.g.: the Product Energy Labelling System (SEEP) for windows, insulation, walls, paints and lifts, and the Energy Labelling System for Fleets (SEEF)).

In industry, with a view to corporate visibility, social responsibility and the promotion of energy efficiency measures developed voluntarily, or within the scope of the SGCIE, the creation of a voluntary system for the energy labelling of industrial undertakings, , enabling organisations to publicise their energy classification, will be considered. Responsibility for designing and managing this system will rest with ADENE.

In turn, in the transport sector, it is important to boost the electric mobility market through specific programmes, guaranteeing the updating of the current favourable tax framework for companies, with a view to promoting electric mobility in the private sector. Work carried out in recent years has enabled the phased introduction of electric vehicles (EV) in the light and mixed-use passenger vehicles and electric scooter market, by extending the rapid charging network and creating conditions for charging in covered public and private car parks. However, there is a clear opportunity to create conditions for the development of domestic charging solutions in shared residential buildings and shared garages. It should be noted that electric vehicles have a tax differentiation that translates to total road tax (IUC) exemption, under the environmental component, and vehicle tax (ISV) exemption under Article 2.2(a) of Annex I to the Vehicle Tax Code, approved by Law No 22-A/2007 of 29 June, in its current wording.

3.5 Promotion of efficiency in heating and cooling

3.5.1 High-efficiency cogeneration (Article 14 of the EED)

With the publication of Decree-Law No 68-A/2015 of 30 April, the second amendment to Decree-Law No 23/2010 of 25 March, as amended by Law No 19/2010 of 23 August, establishing the discipline of cogeneration activity following the paradigm assumed by the EED, and with sustainable remuneration schemes that maintain the incentive for renewable and high-efficiency cogeneration. The amendments introduced favour the installation of small and medium-sized units suitable for sectors with the lowest cogeneration penetration, through a tariff fixed and subsidised according to the efficiency obtained, and the use of renewable fuels, guaranteeing the purchase by the supplier of last resort of energy generated in units with interconnection power of less than 20 MW, guaranteeing the possibility of concluding contracts directly with consumers, or negotiating in the market.

There are 132 mapped cogeneration units in operation in the country as of 2014, distributed into 61 municipalities. These are divided between industry, services and agriculture at 74%, 26% and 1% respectively, totalling 1,759 MW of installed capacity, and 4,631 MW of thermal power, producing a total of 7.5 TWh of electrical energy and 19.2 TWh of thermal energy. Cogeneration units in operation also had an overall efficiency of 79%, and an average number of power usage hours of 4,255 hours. The application of the benchmark values and assumptions associated with the EED, taking into account the fuels used by each unit, and the network losses associated with the monitored voltage level, **resulting in an estimated overall saving of 30,740 TJ (0.73 Mtoe) of primary energy, corresponding to a saving of 33.5%.**

However, the cogeneration potential that is believed to be achievable, based on the situation analysed in 2014, represents 11 TWh to 13 TWh of electricity generation (29% of national consumption) and 2.5 GW to 3.1 GW of installed capacity, representing an increase of 0.7 GW to 1.3 GW of electrical power, maintaining the average operating characteristics currently observed. To achieve this potential, and to ensure the energy savings achieved are sustainable, suitable incentives will be considered to promote high-efficiency cogeneration, and renewables-based cogeneration, favouring the implementation of small and medium power units, and ensuring adequate stability and sustainability of the remuneration schemes provided for in the regulations associated with Decree-Law No 68-A/2015.

With regards to the potential associated with the heating and cooling supply networks, there was sufficient mismatch between consumption supply and demand to justify such networks in an exclusively residential context, due to the climatic conditions and specific characteristics of the building stock in Portugal, which resulted in reduced consumption for space heating, and even less for cooling, and with a very small penetration of centralised air conditioning systems, which further increases costs incurred in any process of adaptation to a new infrastructure. Moreover, the highest density of consumption identified is much lower than the minimum threshold proposed in the EED, so that even when combined with consumption in service buildings, viability thresholds would not be easily reached. These factors explain the existence of just one urban heating and cooling network in mainland Portugal, planned and built under very favourable conditions, during the phase of urbanising a large area dedicated to high-value housing, and a high number of large service buildings. However, due to the costs of using very low-efficiency technologies, their usage is very low.

Increasing the number of cogeneration units, and thus achieving the overall saving of 1 Mtoe of primary energy, is a national target for 2020.

3.6 Efficiency in Energy Transmission and Distribution

3.6.1 Demand Management (Article 15 of the EED)

Portugal has mechanisms for managing demand, such as the interruptibility scheme and tariffs that differentiate by time period in the electricity sector. The tariffs for these are based on the voltage level or type of power supply, and differ per hourly period of energy consumption.

As regards the introduction of dynamic pricing, the regulatory entity has established conditions for a new regulatory framework that facilitates the implementation of pilot projects for dynamic pricing by distribution system operators. This type of pricing ensures greater demand-side participation in the efficient use of resources in the electricity sector. Demand flexibility and participation are fundamental in a context of an increasingly dispersed supply of energy in distribution networks, and using intermittent renewable resources.

3.6.2 Energy Efficiency in Infrastructure (Article 15 of the EED)

National legislation for the energy transmission sector stipulates that the operator of the National Transmission Network (RNT) and the National Natural Gas Transmission Network (RNTGN) must submit, for approval by the DGEG, a proposal for a Plan for Development and Investment in the Electricity Transmission Network (PDIRT-E) and a Plan for Development and Investment in the National Transmission Network, Storage Infrastructure and LNG Terminals (PDIRGN). The plans in question are decennial (10-year horizon) and must be submitted every two years.

In the current legislation on the distribution sector, operators of the National Distribution Network (RND) and of the National Natural Gas Distribution Network (RNDGN) must submit, for approval by the DGEG, a proposal for a Plan for Development and Investment in the Electricity Transmission Network (PDIRD-E) and a Plan for Development and Investment in the Natural Gas Distribution Network (PDIRD-GN). The plans in question are five-yearly (5-year horizon) and must be submitted every two years.

The proposed plans must be submitted by the network operators to the DGEG, which in turn forwards the proposals to the ERSE, which, within the scope of its powers, promotes public consultations on their content.

The Network Development and Investment Plans envisage an improvement in terms of increasing energy efficiency and reducing network losses.

In the electricity sector in particular, the Development and Investment Plans apply a project evaluation methodology with criteria based on the energy efficiency of the infrastructure. The rate of loss of electrical energy in the RNT, measured as the ratio between losses and gross electrical energy consumption, is 1.34% (source: ERSE). The current efficiency of the RND with regards to technical losses can be considered adequate. For the energy transmission figures observed in 2011, this value was estimated at 2.3% of energy input into the RND (source: EDP Distribuição).