REPORT

ON THE PROGRESS RECORDED IN THE ACHIEVEMENT OF THE NATIONAL ENERGY EFFICIENCY OBJECTIVES

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The paper includes 31 tables and 34 figures.

1. INTRODUCTION

On 18 July 2014, the Romanian Parliament adopted **Law No 121/2014 on energy efficiency**, which was published in **Official Gazette, Part I No 574 of 1 August 2014**. The law transposes **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, as published in Official Journal of the European Union, series L No 315 of 14 November 2012.

The law provides that energy efficiency improvement is a strategic objective of the national energy policy due to its major contribution to achieving food safety with energy, sustainable development and competitiveness, to saving primary energy resources and to reducing greenhouse gas emissions.

The policy measures in the field of energy efficiency are applied throughout the entire chain: primary resources, production, distribution, supply, transport and final consumption.

In accordance with Article 1(3) of Law No 121/2014 on energy efficiency, as subsequently amended and supplemented, an indicative national target of a 20 % reduction of energy consumption is set to be achieved by 2020.

In accordance with **Article 3(2)(e) of Law No 121/2014 on energy efficiency**, **as subsequently amended and supplemented**, **the Department for Energy Efficiency** from ANRE has the following responsibility:

> ***"to submit to the Government, by 30 April each year, from 2015 onward, with a view to informing the European Commission, a report on the progress achieved with the fulfilment of the national energy efficiency objectives, which is prepared in accordance with Annex 11, Part 1".***

This annual report is the fifth report prepared in accordance with the law and includes the information requested in Annex 11, Part I(a), (b), (c), (d) and (e) of **Law No 121/2014 on energy efficiency**, **as subsequently amended and supplemented**.

It is noteworthy that **Article 3(2)(e) and Annex 11 of Law No 121/2014 on energy efficiency, as subsequently amended and supplemented**, transpose into the Romanian law the provisions of Article 24(1) and of Annex 14 of Directive 2012/27/EU.

ANRE received information from the European Commission on how to prepare the annual reports. Moreover, meetings were held at European level under the project **"Concerted Action - Energy Efficiency Directive",** attended by the competent authorities from the EU Member States. During these meetings, the EC's DG ENER representatives explained how to prepare annual reports. Among others, the presentations included the definitions and method of calculation of the specific reporting indicators, which cannot be found explicitly in the statistical reports of the authorised institutions (INS at national level, EUROSTAT at European level). Explanations also referred to the significance of certain indicators, where several interpretations were possible. This report was prepared in accordance with the information and specifications received.

ANRE is part of the Energy Efficiency Committee in Brussels (the EED Committee) from DG Energy Unit C3, Energy Efficiency, of the EC, which is mandated to assist the European Commission by adopting measures implementing Directive 2012/27/EU, and supports it in its assessment and evaluation work. This Committee serves as a forum for information and good practices exchange at EU level for the purpose of preparing working documents explaining the key provisions of Directive 2012/27/EU.

In the communications sent to the **Energy Efficiency Department** of ANRE, DG ENER from the EC requested that the annual reports also include other indicators, which are not listed in **Part I, point a of Annex 14**, adding the note that this inclusion is voluntary. This request was considered to the greatest extent possible.

In order to enable the aggregation of results and comparisons, the representatives of the EC's DG ENER recommended to all the Member States to use the EUROSTAT database as a source of primary information in order to ensure uniform reporting. Under these circumstances, primary information from the EUROSTAT database was used in the preparation of this **Report**.

According to the methodological specifications of 30 November 2018 in the "Energy" section of the database, EUROSTAT published a new methodology to achieve energy balance and new indicator codes. The new methodology and the new codes were used to calculate the values of energy indicators in 2017 and in previous years. This may explain certain (small) differences between the historical values in this Report and the ones listed in reports of previous years.

For example, the Eurostat data on primary energy consumption for Romania, which was presented in previous reports until 2016, is presented in Table 1.

Table 1

No	Indicator	m.u.	2016	2015	2014	2013	2012	2011
1	**primary energy consumption**	thousand toe	31 259	31 304	30 637	30 970	33 644	34 830
2	**final energy consumption**	thousand toe	22 280	21 892	21 721	21 834	22 801	22 771

Source: Eurostat

In the context of approving the new legislation under the Clean energy for all Europeans package, Eurostat published the primary and final energy consumption for 2017 (Europe 2020-2030) for Romania in the *Sustainable development indicators – Goal 7 Affordable and clean energy*at the links in Table 2.

Table 2

No	Indicator	m.u.	2017	2016	2015	2014	2013
1	**primary energy consumption**	thousand toe	32 375	30 615	30 730	30 316	30 411

	https://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&language=en&pcode=sdg_07_10&plugin=1						
2	**final energy consumption** https://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&language=en&pcode=sdg_07_11&plugin=1	thousand toe	23 205	22 236	21 850	21 686	21 796

Source: Eurostat

2. UPDATES OF THE MAIN LEGISLATIVE AND NON-LEGISLATIVE MEASURES ENFORCED IN THE PREVIOUS YEAR [as per Annex 11(b) of Law No 121/2014 on energy efficiency, as subsequently amended and supplemented]

A. Primary legislation

- Law No 1/2018 amending and supplementing Government Emergency Order No 33/2007 on the organisation and functioning of the National Energy Regulatory Authority;
- Law No 184/2018 approving Government Emergency Order No 24/2017 amending and supplementing Law No 220/2008 establishing the system for the promotion of energy production from renewable energy sources and amending certain legislative acts;
- Government Decision No 203/2019 approving the National Energy Efficiency Action Plan IV.

B. Secondary legislation

- Order No 19/2018 of ANRE applying for 2017 Articles 21(2) and 27 of the Regulation for qualifying the production of electricity from high-efficiency cogeneration and for verification and monitoring of fuel consumption and useful electricity and heat production in high-efficiency cogeneration, as approved by Order No 114/2013 of the President of the National Energy Regulatory Authority, and Articles 21-23 of the Regulation establishing the method of collection of the contribution for high-efficiency cogeneration and the method of payment of the bonus for electricity produced in high-efficiency cogeneration, as approved by Order No 116/2013 of the National Energy Regulatory Authority;
- Order No 25/2018 of ANRE amending and supplementing Order No 145/2014 of the President of the National Energy Regulatory Authority on the implementation of smart electricity measurement systems;
- Order No 33/2017 of ANRE amending the Regulation for the issue of green certificates, as approved by Order No 4/2015 of the President of the National Energy Regulatory Authority;
- Order No 65/2017 of ANRE amending the Regulation for the organisation and functioning of the market of green certificates, as approved by Order No 77/2017 of the President of the National Energy Regulatory Authority;
- Order No 114/2018 of ANRE amending Order No 123/2017 of the President of the National Energy Regulatory Authority approving the contribution for high-efficiency cogeneration and certain provisions on the invoicing thereof;
- Order No 157/2018 of ANRE approving the Methodology for determination of the annual mandatory quota of green certificates to be purchased;
- Order No 158/2018 of ANRE establishing the estimated mandatory quota of green certificates to be purchased for August-December 2018;
- Order No 163/2018 of ANRE amending the Regulation for the issue of green certificates, as approved by Order No 4/2015 of ANRE, as subsequently amended and supplemented;
- Order No 164/2018 of ANRE approving the Rules for entering in the Register of Green Certificates the green certificates consumed by economic operators in order to meet their obligation to purchase green certificates for the assessment year 2018;
- Order No 177/2018 of ANRE approving the framework requirements for the development of the calendar of implementation of the electricity smart measurement systems at national level;
- Order No 178/2017 of ANRE amending and supplementing the Regulation for the organisation and functioning of the market of green certificates, as approved by Order No 77/2017 of the President of the National Energy Regulatory Authority;
- Order No 179/2018 of ANRE approving the Regulation for amending, suspending, terminating and withdrawing accreditation granted to power plants producing electricity from renewable energy sources, and laying down the rights and obligations of accredited producers of electricity;

- Order No 180/2018 of ANRE amending and supplementing the Methodology for the determination and adjustment of prices in electricity and heat produced and supplied from cogeneration units, which are covered by the support scheme, and of the bonus for high-efficiency cogeneration, as approved by Order No 15/2015 of ANRE;
- Order No 182/2018 of ANRE approving the reference price for the electricity produced in high-efficiency cogeneration, as applicable in 2019 to producers of electricity and heat from cogeneration, which are entitled to a bonus;
- Order No 183/2018 of ANRE approving the reference bonus values for the electricity produced from high-efficiency cogeneration and the reference prices for the heat from cogeneration, which are applicable in 2019;
- Order No 187/2018 of ANRE approving the Procedure for invoicing green certificates;
- Order No 188/2018 of ANRE approving the reference price values for the heat supplied under SACET from central heating plants with cogeneration units, which are not covered by support schemes for the promotion of high-efficiency cogeneration, which are applicable in the first semester of 2019;
- Order No 189/2018 of ANRE regarding the obligation to inform the final customers through the computer interface "Comparator of type electricity supply offers" (Comparator al ofertelor-tip de furnizare a energiei electrice);
- Order No 190/2018 of ANRE supplementing the Methodology for determination and monitoring of the contribution for high-efficiency cogeneration, as approved by Order No 117/2013 of the President of the National Energy Regulatory Authority;
- Order No 192/2018 of the President of ANRE amending Order No 123/2017 of the President of ANRE approving the contribution for high-efficiency cogeneration and certain provisions on the invoicing thereof;
- Order No 206/2018 of the President of ANRE amending Order No 123/2017 of the President of ANRE approving the contribution for high-efficiency cogeneration and certain provisions on the invoicing thereof;
- Order No 226/2018 of ANRE approving the rules for trading electricity produced in power plants from renewable energy sources with installed power of not more than 27 kW belonging to prosumers;
- Order No 227/2018 of ANRE approving the framework contract for the sale/purchase of electricity produced by prosumers having power plants that produce electricity from renewable energy sources with installed power of not more than 27 kW per consumption site, and amending certain regulations in the energy sector;
- Order No 228/2018 of ANRE approving the Technical Rule entitled "Technical conditions for connection to the public electricity grids for prosumers with injection of active power into the grid";
- Order No 2544/2018 of the Ministry of Regional Development and Public Administration (*Ministerul Dezvoltării Regionale și Administrației Publice - MDRAP*) approving the National Programme for energy efficiency increase in residential blocks, with funding in 2018;
- Order No 4494/2018 of MDRAP approving the List of reference designators of the Romanian standards transposing harmonised European standards in the area of construction products;
- Order No 4579/2018 of MDRAP regarding the allocation of amounts for the co-financing of investment works for the rehabilitation of centralised heat supply systems for localities in accordance with the "2006-2020 district heating - heat and comfort" Programme (Termoficare 2006-2020 căldură și confort);
- Order No 5732/3282/2018 of MDRAP and of the Ministry of Public Finance (*Ministerul Finantelor Publice - MFP*) for application in Fagaras Municipality, Brasov County of Article 3(5) of Government Order No 36/2006 regarding certain measures for the operation of centralised heat supply systems for the population;

- Order No 241/2018 of the Deputy Prime Minister and of the Minister for the Environment amending and supplementing the Guidelines for financing the 2017-2019 Programme for the incentivization for renewing the national vehicle fleet, as approved by Order No 661/2017 of the Deputy Prime Minister and of the Minister for the Environment;
- Order No 278/2018 of the Deputy Prime Minister and of the Minister for the Environment amending and supplementing the Guidelines for funding the Programme for the reduction of greenhouse gas emissions in transport by promoting clean and energy-efficient road transport vehicles, 2017-2019, as approved by Order No 660/2017 of the Deputy Prime Minister and of the Minister for the Environment.
- Order No 760/2018 of the Minister for the Environment approving the Guidelines for funding the Programme for the reduction of greenhouse gas emissions in transport by promoting the infrastructure for clean and energy-efficient road transport vehicles: reloading stations for electric vehicles in county capital towns;
- Order No 1364/2018 of the Minister for the Environment amending and supplementing the Guidelines for funding the Programme for the reduction of greenhouse gas emissions in transport by promoting clean and energy-efficient road transport vehicles, 2017-2019, as approved by Order No 660/2017 of the Deputy Prime Minister and of the Minister for the Environment;
- Order No 1287/2018 of the Minister for the Environment approving the Guidelines for funding the Programme regarding the installation of photovoltaic panel systems for the production of electricity in order to cover the consumption demand and to supply the surplus to the national grid;
- Order No 1305/2018 of the Minister for the Environment approving the Guidelines for funding the Programme regarding the installation of photovoltaic systems for isolated households not connected to the electricity grid;
- Instruction No 97 of 21 March 2018 of the President of the Environmental Fund Administration (*Administrația Fondului pentru Mediu*) on the amount allocated under the 2017-2019 Programme for the reduction of greenhouse gas emissions in transport by promoting clean and energy-efficient road transport vehicles;
- Instruction No 161 of 3 May 2018 of the President of the Environmental Fund Administration regarding the organisation of the session for the submission of financing applications under the Programme concerning Ro-La transportation;
- Instruction No 183 of 29 May 2018 of the President of the Environmental Fund Administration regarding the organisation of the session under the 2017-2019 Programme for the reduction of greenhouse gas emissions in transport by promoting clean and energy-efficient road transport vehicles;
- Instruction No 344 of 14 September 2018 of the President of the Environmental Fund Administration on the organisation of the session for the submission of financing application files under the Programme for the improvement of air quality and the reduction of greenhouse gas emissions by using motor less polluting vehicles in the local public passenger transport;
- Instruction No 454 of 22 November 2018 of the President of the Environmental Fund Administration regarding the extension of the session for registration with a view to accepting legal persons as applicants under the 2017-2019 Programme for the reduction of greenhouse gas emissions in transport by promoting clean and energy-efficient road transport vehicles;
- Instruction No 474 of 3 December 2018 of the President of the Environmental Fund Administration regarding the opening of the session of validation of traders under the National Programme for replacement of used electrical and electronic equipment with more energy efficient ones;
- Instruction No 489 of 13 December 2018 of the President of the Environmental Fund Administration regarding the amendment of the amounts allocated to natural and legal persons under the 2017-2019 Programme for fostering the renewal of the national vehicle fleet;

- Instruction No 494 of 19 December 2018 of the President of the Environmental Fund Administration regarding the organisation of the session of registration of natural persons as applicants under the National Programme for replacement of used electrical and electronic equipment with more energy efficient ones.

3. MACROECONOMIC INDICATORS ON TREND IN ENERGY CONSUMPTION [as per Annex 11(a) of Law No 121/2014 on energy efficiency, as subsequently amended and supplemented]

In accordance with **Section I of Annex 11 to Law No 121/2014 on energy efficiency, as subsequently amended and supplemented**, annual reports underlie the follow-up on the progress achieved towards the national targets for 2020. They must include, as minimum information, an estimate of several indicators (provided for by the law) for the year preceding the last year ended. This report should thus include information for 2017. It is also provided that, in the sectors where energy consumption is kept stable or indicates a certain growth level, the underlying causes are reviewed and the assessment is included with the estimates.

Table 3 includes the values recorded in 2017 for the indicators listed in **Section I(a) of Annex XI** to the relevant legal act. In order to enable comparisons and to identify trends, values from the period 2013-2015 were also included. The designation of indicators and the order of their presentation are consistent with the designation and order in **Section I(a) of Annex 11** to the relevant legal act.

Table 3

No	Indicator	m.u.	2017	2016	2015	2014	2013
1	**primary energy consumption**	**thousand toe**	**32 375**	**30 615**	**30 730**	**30 316**	**30 411**
2	**final energy consumption**	**thousand toe**	**23 205**	**22 236**	**21 850**	**21 686**	**21 796**
2.1	*final energy consumption in the industry*	*thousand toe*	*6 390*	*6 264*	*6 419*	*6 427*	*6 273*
2.2	*final energy consumption in transport*	*thousand toe*	*6 149*	*5 738*	*5 338*	*5 266*	*5 289*
2.3	*final energy consumption in households*	*thousand toe*	*7 679*	*7 415*	*7 375*	*7 409*	*7 722*
2.4	*final energy consumption in services*	*thousand toe*	*1 841*	*1 806*	*1 762*	*1 768*	*1 785*
2.5	*final energy consumption in agriculture*	*thousand toe*	*494*	*453*	*459*	*421*	*469*
3	***gross added value, of which:***	*EUR millions in 2010*	145 320	135 719	129 334	125 015	120 814
3.1	*industry*	*EUR millions in 2010*	53 243	49 946	46 967	44 500	42 805
3.2	*services*	*EUR million in 2010*	86 721	80 821	77 530	74 490	72 178

4	**total disposable income of households**		EUR million	105 795	95 303	88 121	82 251	80 761
5	gross domestic product	in prices for 2010	EUR million in 2010	162 803	152 165	145 195	139 783	135 173
		in current prices	EUR million	187 517	170 394	160 298	150 458	143 801
		at the purchasing power parity	EUR million PPP	367 821	342 122	322 072	302 357	290 633
6	**GDP growth rate compared to the previous year**		**%**	7.0	4.8	3.9	3.4	3.5
7	**production of electricity based on production of heat**		TWh	40.1	38.1	40.2	38.5	38.6
8	**production of electricity based on combined production of electricity and heat**		TWh	9.4	9.0	9.7	11.1	12.0
9	**production of heat based on production of thermal energy**		thousand toe	1 781	1 833	1 830	1 863	2 026
10	**production of heat based on combined electricity and heat production plants, including industrial residual heat**		thousand toe	1 373.2	1 502.5	1 515.1	1 537	1 648.1
11	**consumption of fuel for production of heat**		thousand toe	10 820	10 425	10 987	10 619	10 799
12	**passengers-kilometres**		millions of passengers per km	23 850	23 740	22 630	23 326	21 510
13	**tons-kilometres**		millions of tons per km	82 090	75 995	66 892	60 143	60 038
14	**population**		thousands of inhabitants	19 644	19 760	19 870	19 947	20 020
15	**losses in transport and distribution grids**		thousand toe	996	1 073	1 077	1 069	1 116
16	**heat produced in the plants supplying district heating networks**		thousand toe	326.4	214.7	216.5	228.9	247.6

17	**fuel consumption in the plants supplying district heating networks**	thousand toe	368.2	245.2	366.7	401.6	433.5

Source: EUROSTAT

In order to provide a more comprehensive picture of the endeavours to increase energy efficiency at national level and of the results achieved, the values of other energy indicators at macro-economic level were also calculated (primary energy intensity, final energy intensity etc.). The values of these indicators are listed in **Table 4**.

Table 4

No	Indicator		MU	2017	2016	2015	2014	2013
1	**Gross internal consumption of primary energy**		thousand toe	33 445	31 758	31 855	31 566	31 868
2	**Energy productivity**	**GDP calculated in EUR 2010**	EUR 2010/ kgoe	4.9	4.8	4.6	4.4	4.2
		GDP calculated in EUR at the purchasing power parity	EUR PPP/kgoe	11.0	10.8	10.1	9.6	9.1
3	Primary energy intensity	GDP calculated in EUR 2010	kgoe/ EUR 2010	0.205	0.209	0.219	0.226	0.236
		GDP calculated in EUR	kgoe/ EUR	0.178	0.186	0.199	0.210	0.222
		GDP calculated in EUR at the purchasing power parity	kgoe/ EUR PPP	0.091	0.093	0.099	0.104	0.110
4	Final energy intensity	GDP calculated in EUR 2010	kgoe/ EUR 2010	0.143	0.146	0.150	0.155	0.161
		GDP calculated in EUR	kgoe/ EUR	0.124	0.130	0.136	0.144	0.152
		GDP calculated in EUR at the purchasing power parity	kgoe/ EUR PPP	0.063	0.065	0.068	0.072	0.075

5	**Primary energy consumption per inhabitant**	toe/capita	1.648	1.549	1.546	1.520	1.519
6	**Final energy consumption per inhabitant**	toe/capita	1.181	1.125	1.100	1.087	1.089
7	**Final energy consumption of households per capita**	toe/capita	0.391	0.375	0.371	0.371	0.386

Source: EUROSTAT

The main observations and comments on the values of these indicators are the following:

The primary and final energy consumption values (Nos 1 and 2 of Table 3) are fundamental indicators in the monitoring of progress achieved overall at EU level and by each Member State towards the targets set under Directive 2012/27/EU.

Primary and final energy consumption values increased in 2017 by 5.7 % and 4.2 %, respectively, compared to the previous year. However, these increase rates were below the GDP economic development rate, increasing by 7.0 % (compared to 2.0 %, which is the average EU value; only the GDP growth rate in Ireland is higher by 7.2 % than that of Romania). Therefore, it is obvious that this increase in energy consumption was triggered by the national economic development and that it occurred in the context of an increase in energy efficiency.

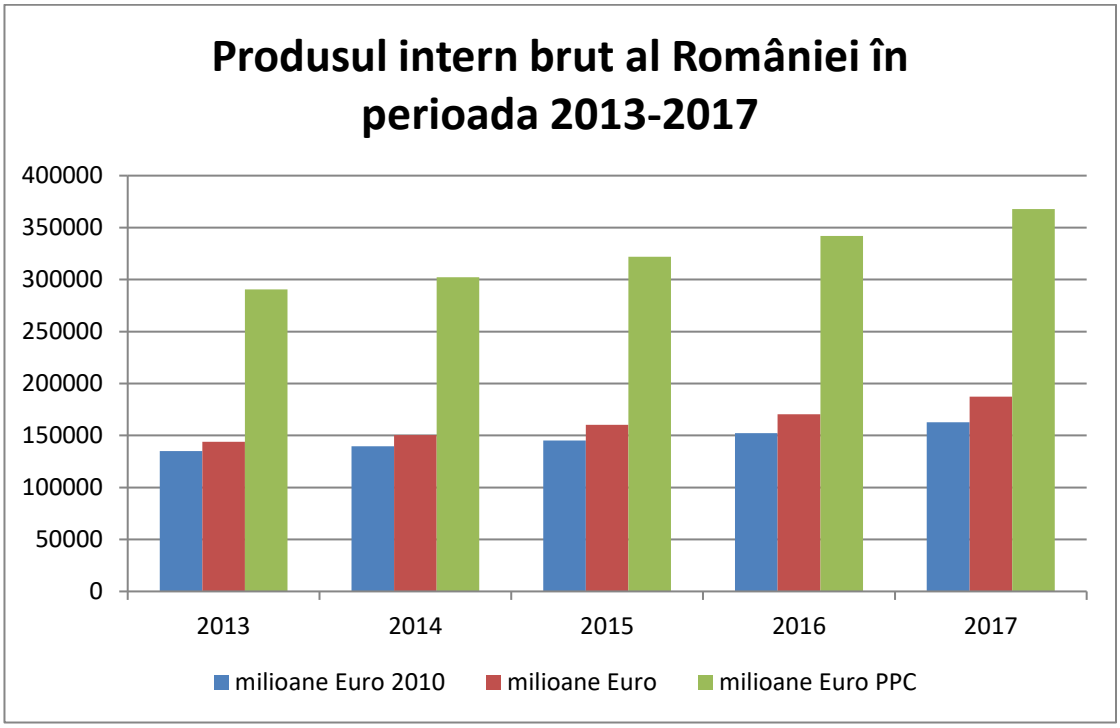
This is valid both at the level of the national economy overall, and at the level of economic branches. Thus, energy consumption in the industry increased by 2 %, whereas GVA increased by 6.9 %. In the services sector, energy consumption increased by 1.9 %, whereas GVA increased by 7.3 %. Energy consumption in transport increased by 7.1 %, and the work volume in the shipment of goods increased by 8.0 %.

The household sector records the highest rate in final energy consumption at national level (33.6 % in 2017). A 3.5 % increase in consumption has been recorded compared to the previous year against the background of the measures taken in order to increase the living standard and, implicitly, to improve the quality of people's lives. The energy efficiency policies and the developed programmes (thermal insulation of residential blocks, labelling of electric domestic appliance receivers etc.) have led, in the past four years, to a lower consumption rate in the household sector compared to that in 2013.
Gross domestic product (GDP) is expressed in EUR at a first stage, depending on its value in the national currency and its parity to the euro. Certain corrections are frequently made and the most common ones are:

- Removing the influence of price variation on the domestic market (calculated in euro) in relation to a certain year chosen as reference year (2010) with the expression of GDP in euro for 2010.
- Introducing the influence of the population's purchasing power and using the purchasing power parity (PPP) between the national currency and EUR, with the expression of GDP in EUR PPP.

  The GDP values in EUR for 2010, EUR and EUR PPP (from the EUROSTAT database) are listed in Table 3 and Figure 1.

Figure 1



Source: EUROSTAT

RO	EN
Produsul intern brut al României în perioada 2013-2017	Gross domestic product of Romania in the period 2013-2017
milioane Euro 2010	EUR million in 2010
milioane Euro	EUR million
milioane Euro PPC	EUR million PPP

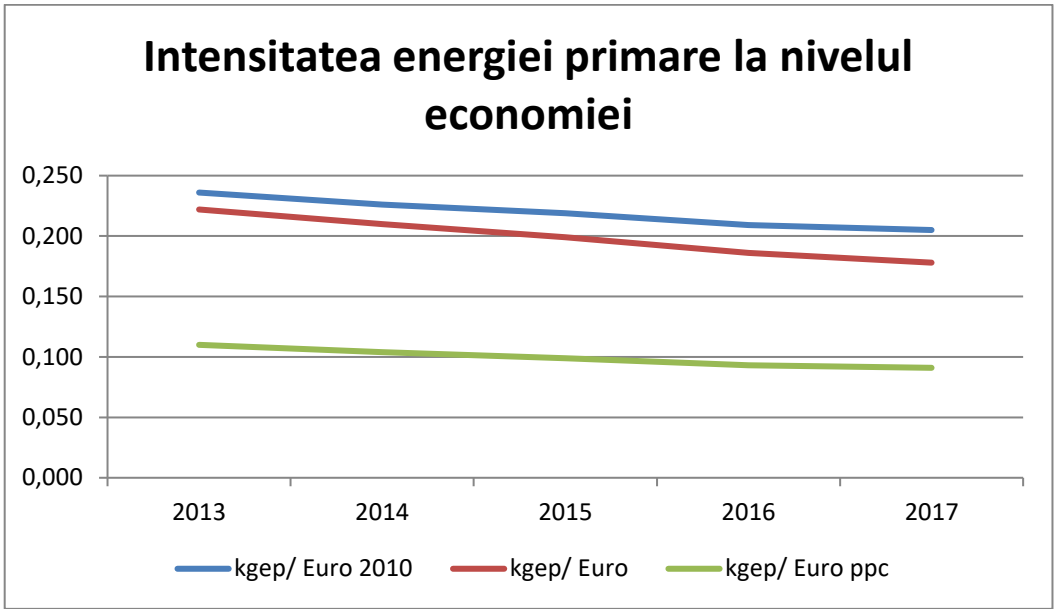
For developed countries, such corrections, more specifically the choice of a measurement unit in the calculation of the GDP has a relatively low influence on the final outcome. For Romania, this choice influences considerably the values of macro-economic energy efficiency indicators and the qualitative assessments thereof.

The macro-economic energy efficiency indicator traditionally used at national and international level was "primary energy intensity" (commonly referred to as "*energy intensity*") and defined as the ratio between gross primary energy consumption and the GDP. The indicator "final energy intensity" was also used in addition and complementarily.

However, EUROSTAT has recently prepared a new list of sustainable development indicators, which includes, in the section entitled "Sustainable Development Indicators - Goal 7: Affordable and clean energy", the new indicator: "Energy productivity", which will be presented afterwards.

EUROSTAT does not list any longer the values of the indicator "Energy intensity" and it is virtually no longer used in the EC's recent documents. Considering its traditional nature and that specialists and summary and decision-making bodies are familiar with it, its values were still presented in Table 4 and Figure 2. It is noteworthy that the respective values were calculated by ANRE based on the primary information in EUROSTAT. The value of this indicator depends to a great extent, for Romania, on how the GDP is expressed. Irrespective of the measurement unit used, the energy intensity is on a constantly falling trend. This trend features the entire development after 1992.

Figure 2



Source: EUROSTAT

RO	EN
Intensitatea energiei primare la nivelul economiei	Primary energy intensity at economy level
kgep/Euro 2010	kgoe/EUR 2010
kgep/Euro	kgoe/EUR
kgep/Euro ppc	kgoe/EUR PPP

Energy productivity is the indicator recently introduced by EUROSTAT in order to characterise the efficiency in energy use. Its values are listed in the section entitled "Sustainable Development indicators - Goal 7 - Affordable and clean energy" of the database.

Considering the novelty of this indicator, its description by **EUROSTAT** is presented below:

Short description: the indicator measures the ratio between the GDP and the gross domestic energy consumption. Gross domestic energy consumption is consumption of primary energy, plus the amounts of energy used for non-energy purposes. Gross domestic product (GDP) is expressed either in EUR for the reference year 2010, or at the purchase power parity (PPP). The former is used to observe the trend in time for a specific region, whereas the latter enables to compare Member States in a certain year.

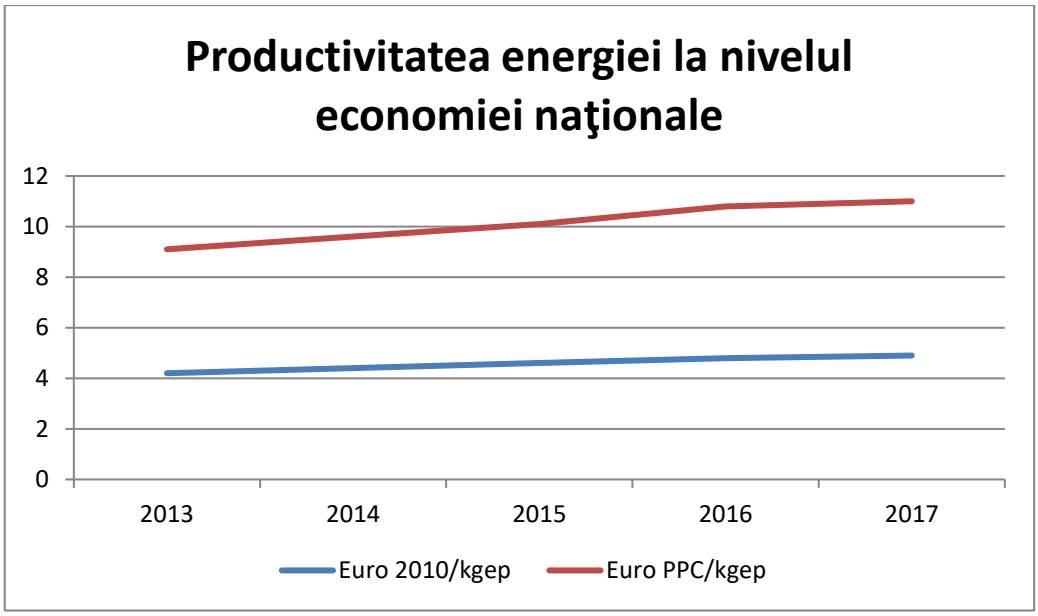
The indicator "Energy productivity" is thus, by definition, the reverse of the indicator "Energy intensity".

It is explicitly noted that:
- the values calculated in "EUR 2010/kg.ep" are used (only) to examine the trend in time for the energy productivity (more specifically, the efficiency in use at macro-economic level) for a certain region/country

- for international comparisons regarding energy productivity in a given year, the values calculated in "EUR PPP/kg.ep" are used.

The values of this indicator for Romania, which are taken from the EUROSTAT database, are listed in Table 4 (No 2) and Figure 3.

Figure 3



Source: EUROSTAT

RO	EN
Productivitatea energiei la nivelul economiei naționale	Energy productivity at national economy level
Euro 2010/kgep	EUR 2010/kgoe
Euro PPC/kgep	EUR PPP/kgoe

In the analysed period (2013-2017), energy productivity in Romania (in EUR 2010/kg.ep) increased steadily by 16.7 %. At EU-28 level, in the same period, there was a 9 % increase.

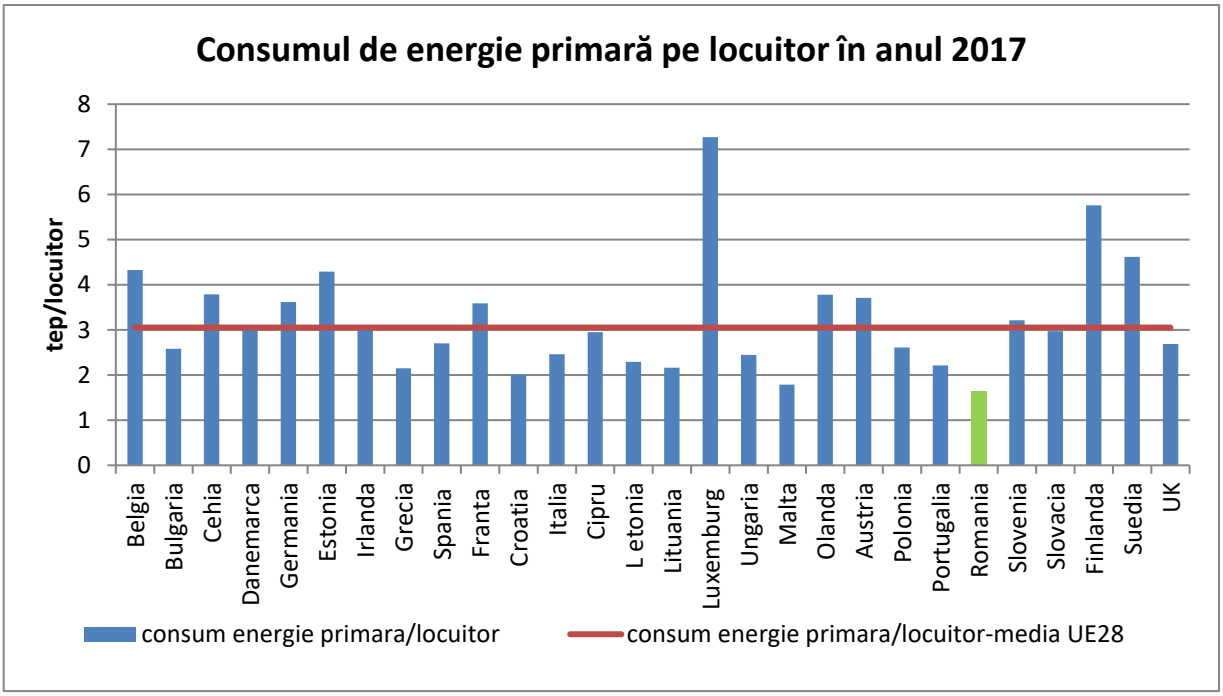
Energy productivity at the level of national economy is first of all a macro-economic parameter. Its values depend both on the technical performances of energy use and (particularly) on the structure and performances of the national economy. The ongoing and significant increase in the energy productivity values was enabled by both technical measures for increasing the efficiency of energy use and by structural economic measures

4. POSITION HELD BY ROMANIA IN EUROPE IN TERMS OF ENERGY EFFICIENCY

4.1 Quantitative appraisals and qualitative assessments *on energy efficiency* in Romania and the possibilities for a prospective decrease in energy consumption should consider the current level of such consumption.

Romania records the lowest primary energy consumption value per capita in the 28 EU Member State (1 648 toe/capita in 2017), which is almost twice lower than the EU-28 average in the same year (3 052 toe/capita) (Figure 4).

Figure 4



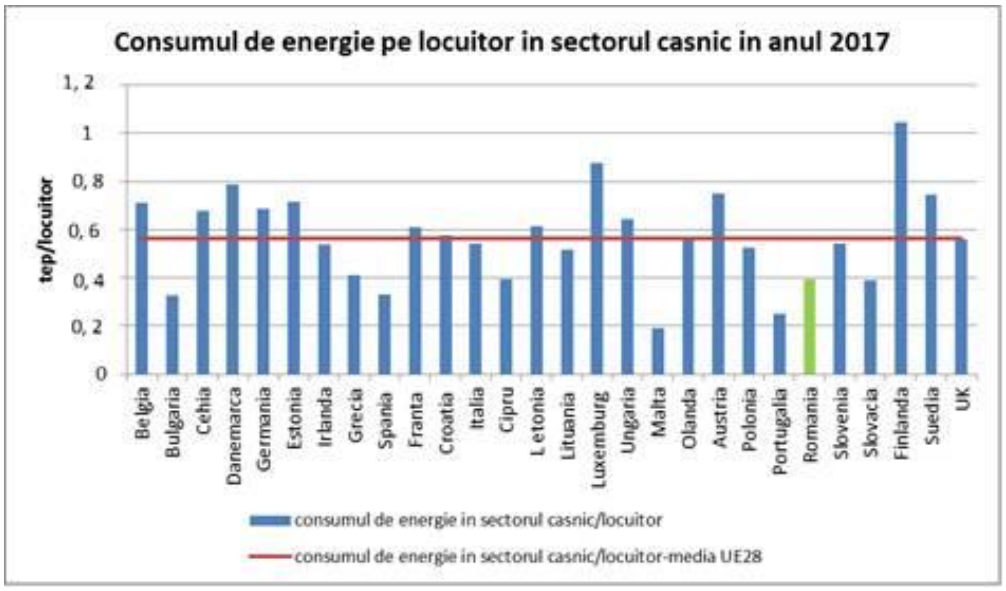
Source: EUROSTAT

RO	EN
Consumul de energie primară pe locuitor în anul 2017	Primary energy consumption per capita in 2017
tcp/locuitor	toe/capita
Belgia	Belgium
Bulgaria	Bulgaria
Cehia	Czech Republic
Danemarca	Denmark
Germania	Germany
Estonia	Estonia
Irlanda	Ireland
Grecia	Greece
Spania	Spain
Franța	France
Croația	Croatia

Italia	Italy
Cipru	Cyprus
Letonia	Latvia
Lituania	Lithuania
Luxemburg	Luxembourg
Ungaria	Hungary
Malta	Malta
Olanda	Netherlands
Austria	Austria
Polonia	Poland
Portugalia	Portugal
Romania	Romania
Slovenia	Slovenia
Slovacia	Slovakia
Finlanda	Finland
Suedia	Sweden
UK	UK
consum energie primară/locuitor	primary energy consumption/capita
consum energie primară/locuitor-media UE28	primary energy consumption/capita-EU-28 average

In Romania, energy consumption in the household sector per capita, as recorded in 2017 (0.392 toe/capita), accounted for 69.6 % compared to the EU-28 average, the statement being shown in the chart in Figure 5. Differences from Northern countries are normal, considering the differences in weather conditions. However, differences from countries with similar geographical weather conditions or even milder conditions (Italy, Slovenia, Croatia etc.) have also been recorded.

Figure 5 - Final energy consumption/capita in the household sector in 2017

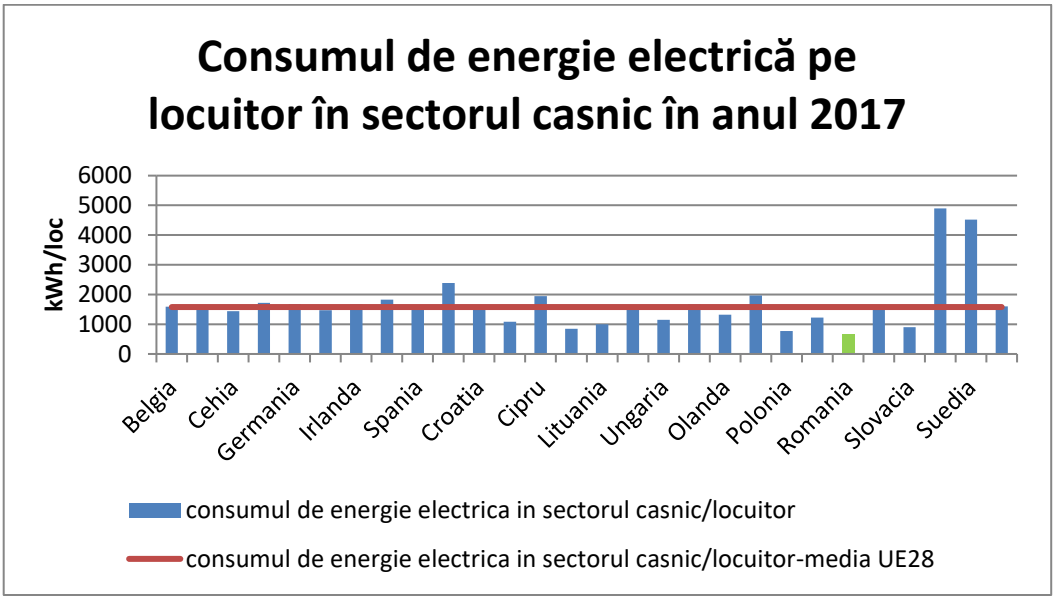


RO	EN

Consum energie pe locuitor în sectorul casnic în anul 2017	Energy consumption per capita in the household sector in 2017
tcp/locuitor	toe/capita
Belgia	Belgium
Bulgaria	Bulgaria
Cehia	Czech Republic
Danemarca	Denmark
Germania	Germany
Estonia	Estonia
Irlanda	Ireland
Grecia	Greece
Spania	Spain
Franța	France
Croația	Croatia
Italia	Italy
Cipru	Cyprus
Letonia	Latvia
Lituania	Lithuania
Luxemburg	Luxembourg
Ungaria	Hungary
Malta	Malta
Olanda	Netherlands
Austria	Austria
Polonia	Poland
Portugalia	Portugal
Romania	Romania
Slovenia	Slovenia
Slovacia	Slovakia
Finlanda	Finland
Suedia	Sweden
UK	UK
consumul de energie în sectorul casnic/locuitor	energy consumption in the household sector/capita
consumul de energie în sectorul casnic/locuitor-media UE28	energy consumption in the household sector/capita - the EU28 average

Differences grow significantly and reach limit levels if we are to consider the electricity consumption in the household sector per capita. Romania records the lowest electricity consumption per capita in the EU (i.e. 641 kWh/capita in 2017), which is 2.46 times lower than the EU-28 average (i.e. 1 579 kWh/capita). The statement is shown in the chart in Figure 6.

Figure 6



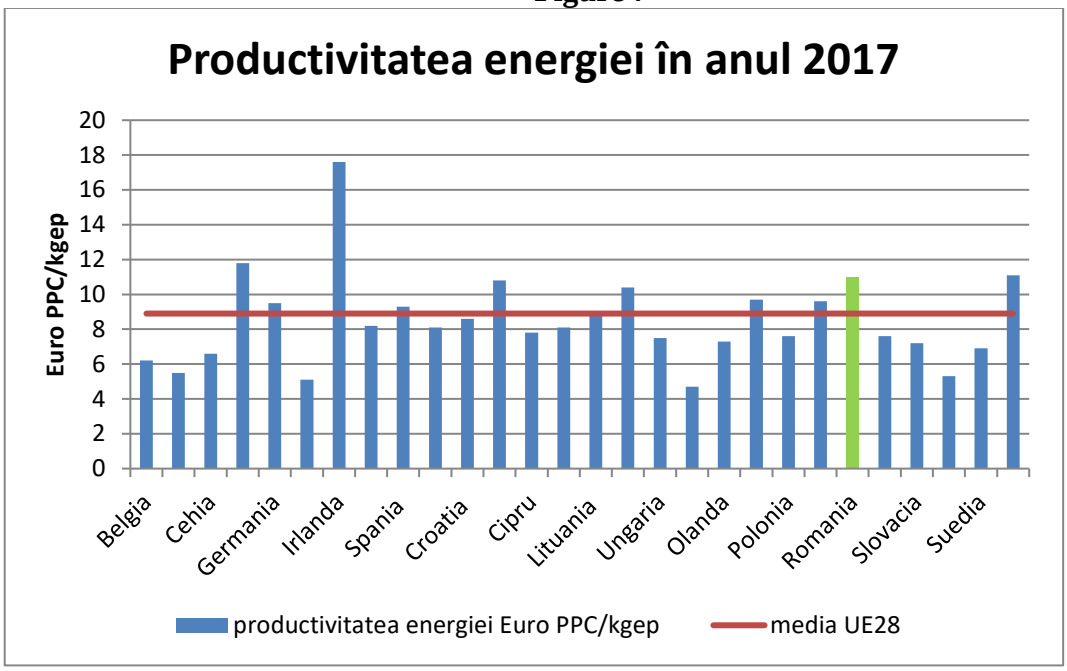
Source: EUROSTAT

RO	EN
Consumul de energie electrică pe locuitor în sectorul casnic în anul 2017	Electricity consumption per capita in the household sector in 2017
kWh/loc	kWh/capita
Belgia	Belgium
Cehia	Czech Republic
Germania	Germany
Irlanda	Ireland
Spania	Spain
Croația	Croatia
Cipru	Cyprus
Lituania	Lithuania
Ungaria	Hungary
Olanda	Netherlands
Polonia	Poland
Romania	Romania
Slovacia	Slovakia
Suedia	Sweden
consumul de energie electrică în sectorul casnic/locuitor	electricity consumption in the household sector/capita
consumul de energie electrică în sectorul casnic/locuitor-media UE28	electricity consumption in the household sector/capita - the EU28 average

4.2. Energy productivity

According to the abovementioned **EUROSTAT** statements, the value of the indicator expressed in EUR PPP/kgoe is used for international comparisons. The values of this indicator in 2017 for the 28 EU Member States are listed in Figure 7.

Figure 7



Source: EUROSTAT

RO	EN
Productivitatea energiei în anul 2017	Energy productivity in 2017
Euro PPC/kgep	EUR PPP/kgoe
Belgia	Belgium
Cehia	Czech Republic
Germania	Germany
Irlanda	Ireland
Spania	Spain
Croația	Croatia
Cipru	Cyprus
Lituania	Lithuania
Ungaria	Hungary
Olanda	Netherlands
Polonia	Poland
Romania	Romania
Slovacia	Slovakia
Suedia	Sweden
Productivitatea energiei Eurp PPC/kgep	Energy productivity EUR PPP/kgoe
Media UE28	EU-28 average

In 2017, the "Energy Productivity" indicator had, for Romania, the value of EUR 11.0 PPP/kgoe, which is higher than the average of the EU-28 (i.e. EUR 8.9 PPP/kgoe). Romania is ranked fourth in a rank order list of the EU Member States, being exceeded only by Ireland, Denmark and Great Britain.

The Department for Energy Efficiency of ANRE has pleaded for several years (including in the previous Progress Reports) for international comparisons to be made by using macro-economic energy efficiency indicators calculated with the GDP at the purchasing power parity. This viewpoint was also shared by other prestigious international organisations, among which the World Energy

Council. We consider that the current view of EUROSTAT, which is materialised in the introduction of the new indicator, and the abovementioned methodological indications engender a much more accurate reflection of the realities pertaining to each state.

5. MONITORING IN THE FIELD OF ENERGY EFFICIENCY

The work of the Directorate for Energy Efficiency Monitoring (DMEE) of the Energy Efficiency Department (DEE) was focused on four main coordinates:

- Monitoring compliance with Law No 121/2014, as subsequently amended and supplemented, for the main categories of energy consumers:
  - 5.1 Economic operators
  - 5.2 Local authorities
- Checking compliance with the provisions of directives and regulations providing for the market surveillance work:
  - 5.3 Monitoring the energy consuming equipment market.
- Monitoring energy savings achieved through the implementation of the National Energy Efficiency Action Plan (NEEAP)
  - 5.4 Monitoring the NEEAP

Considering that in 2015 the Integrated Information System software platform (MIS) of ANRE was extended by the component intended for energy consumer monitoring, in 2018 DMEE continued to carry out the implementation of this platform.

5.1 Monitoring of economic operators

The monitoring activity was performed on the basis of the Annual Statements of Total Energy Consumption and the Energy Assessment Questionnaires completed by the economic operators in accordance with Article 9(4) of Law No 121/2014 on energy efficiency, as subsequently amended and supplemented.

Considering that these operators have the obligation to submit, by 30 April of each year, these documents containing statistical data on energy consumption from the previous year, the 2017 activity was monitored during 2018 for 1 361 economic operators, of which 768 operators recorded consumption values above 1 000 toe/year and 593 operators with consumption values below 1 000 toe/year.

The ANRE database, where economic operators are classified according to the codes of activities in the national economy (CAEN), was completed on the basis of these documents. Table 5 presents a summary of this database which contains a total number of 1 361 economic operators, of which:

- 768 economic operators recorded energy consumption above 1 000 toe/year, (56.43 %)
- 593 economic operators recorded energy consumption below 1 000 toe/year: (43.57 %)

The situation of the 768 consumers recording energy consumption above 1 000 toe/year is the following:

- number of final energy consumers with consumption above 50 000 toe/year: 37 (4.83 %)
- number of final energy consumers with consumption between 5 000 and 50 000 toe/year: 87 (11.32%)
- number of final energy consumers between 1 000 and 5 000 toe/year: 644 (83.85).

Table 5

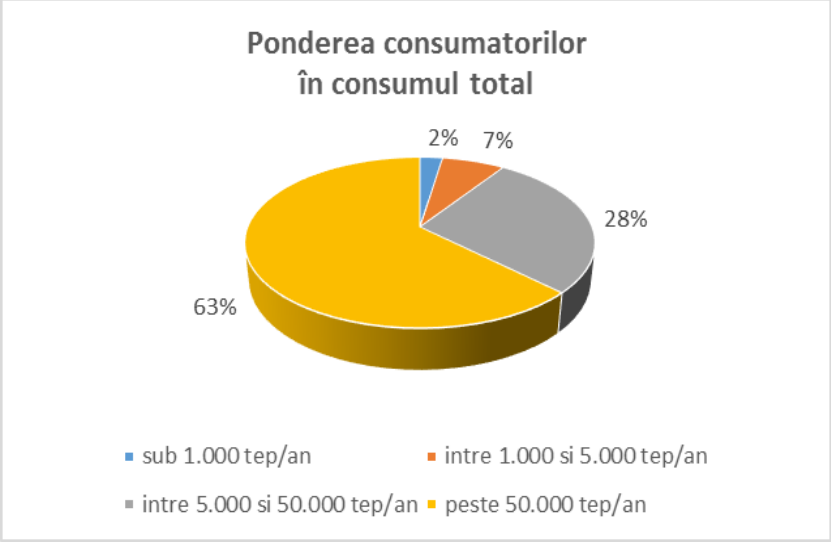
Index CAEN	Classification as per the CAEN code	Number of economic operators	Consumption in 2017 [toe]
A	Agriculture, forestry and fishing	38	111 782.30

B	Mining and Quarrying	34	1 202 948.36
C	Manufacturing industry	719	6 191 944.24
D	Production and supply of electricity and heat, gas, hot water and air conditioning	81	2 279 117.73
E	Water supply, sanitation, waste management and decontamination activities	60	102 128.30
F	Construction	60	70 575.59
G	Wholesale and retail trade; motor vehicle and motorcycle repairs	94	233 726.30
H	Transport and storage	85	833 454.81
I	Hotels and Restaurants	25	27 064.84
J	Information and communication	25	83 596.88
K	Financial intermediation and insurance activities	19	33 393.80
L	Real estate transactions	72	81 056.84
M	Professional, scientific and technical activities	18	21 601.94
N	Administrative and support service activities	7	9 529.58
O	Public administration and defence; statutory social security system	3	6 794.09
P	Education	12	36 337.59
Q	Health and social assistance	8	7 114.71
R	Performance, entertainment and recreational activities	1	1 548.78
GRAND TOTAL		**1 361**	**11 333 716.68**

Source: ANRE

Figure 8 below shows the rate of these consumers in total consumption:

Figure 8



RO	EN
Ponderea consumatorilor în totalul consum	Share of consumers in total consumption

Sub 1000 tep/an	Below 1 000 toe/year
Între 1000 și 5000 tep/an	Between 1 000 and 5 000 toe/year
Între 5000 și 50000 tep/an	Between 5 000 and 50 000 toe/year
Peste 50000 tep/an	Over 50 000 toe/year

Energy management for 2017 was provided to final energy consumers with annual consumption of energy resources above 1 000 toe by 441 energy managers attested by ANRE, 20 authorised natural persons (PFA) and 71 companies providing energy services authorised by ANRE.

The number of energy manager certificates dropped to 413 at the end of 2018 because of an absence of a request to extend the validity of the certificates.

The coverage rate of certified and authorised energy management at economic operators is 95.3 %. This energy management has the following structure:

- with own energy managers certified by ANRE - 384 consumers (50 %)
- with authorised natural persons (PFA) and energy service companies - 348 consumers (45.3 %)
- without certified energy management - 36 consumers (4.7 %).

The work for the implementation of the Integrated Information System software platform of ANRE (MIS)

In order to facilitate the collection and, particularly, the processing of the reporting data from energy consumers monitored in the industry, the online reporting procedure was initiated in 2015 based on the MIS information software of ANRE, which was extended with a component pertaining to energy efficiency issues.

In 2017, Decision No 860 of 13 June 2017 of ANRE introduced the obligation of energy managers to upload the data to the (MIS) Integrated Information System software platform of ANRE for the collection of accurate data and the automated preparation of the summary report on the stage of implementation of the energy efficiency programmes by economic operators.

A number of 198 passwords were allocated in 2018 and, in the end, 1 300 economic operators received the password and uploaded the documents to the ANRE's Integrated Information System software platform (MIS).

5.2. Monitoring of localities with over 5 000 inhabitants

In accordance with Law No 121/2014 on energy efficiency, as subsequently amended and supplemented, the local public administration authorities with a population count of more than 5 000 inhabitants must prepare energy efficiency improvement programmes, which include short-term and 3- to 6-year measures.

Moreover, local public administration authorities in the localities with a population count of more than 20 000 inhabitants must prepare energy efficiency improvement programmes including short-term and 3- to 6-year measures and appoint an energy manager certified under the law in force, or to conclude an energy management contract with an authorised natural person certified under the law, or with a legal person which provides energy services and which is approved under the law.

These energy efficiency improvement programmes are prepared in accordance with the model approved under ANRE Decision No 7/2015 and are submitted by 30 September of the year when they were prepared and updated tables are to be reported annually in the approved template.

In 2018, ANRE initiated the procedure for updating the model for the preparation of the Energy Efficiency Improvement Programme (EEIP) for the localities with a population count above 5 000

inhabitants following the proposals received from OER (Orașe Energie în România) to improve the collection of technical data required for such preparation. These proposals were discussed among the OER members during regional consultations held in 2018 and during the bilateral meetings with the energy distributors.

Moreover, a significant contribution to the model updating was brought by the Society of Auditors and Energy Managers in Romania (*Societatea Auditorilor și Managerilor Energetici din România - SAMER*).

Having regard to these proposals, the updated model for the preparation of the Energy Efficiency Improvement Programme for the localities with a population count over 5 000 inhabitants was posted on 22 October 2018 on the website of the institution under the section of Energy efficiency/legislation/EE discussion documents (Eficienţă Energetică / Legislație / Documente de discuție EE).

On 29 November 2018, OER organised the event entitled "Club of Mayors for Sustainable Climate and Energy" (Clubul primarilor pentru climă și energie durabilă) at Belvedere Hotel in Brasov, where presentations and discussions revolved around the results of the OER-ANRE bilateral meetings and where the updated model was presented.

On 15 October 2018, only 33 local public authorities with a population count over 5 000 inhabitants submitted EEIPs/tables/letters to ANRE, more specifically: Cugir Town, Sebeș Municipality, Arad Municipality, Pitești Municipality, Nicolae Bălcescu Commune, Botoșani Municipality, Brașov Municipality, Brăila Municipality, Buzău Municipality, Caransebeș Municipality, Cluj-Napoca Municipality, Turda Municipality, Sfântu Gheorghe Municipality, Târgoviște Municipality, Craiova Municipality, Sadova Commune, Hunedoara Municipality, Slobozia Municipality, Cornetu Commune, Drobeta-Turnu Severin Municipality, Reghin Municipality, Târnăveni Municipality, Piatra Neamț Municipality, Roman Municipality, Ploiești Municipality, Boldești-Scăeni Town, Rafov Commune, Sibiu Municipality, Mediaș Municipality, Vereşti Municipality, Zvoriștea Commune, Babadag Town, Sector 6 of Bucharest Municipality.

Considering that the number of local authorities with a population count over 5 000 inhabitants, which complied with the legal provisions [Article 9(20), (21), and (22) of Law No 121/2014 on energy efficiency, as subsequently amended and supplemented], was very low and due to the fact that Law No 121/2014 on energy efficiency, as subsequently amended and supplemented, does not provide for penalties for non-compliance, ANRE initiated the following actions:

- On 27 October 2018, ANRE attended, as a speaker, the event entitled "Integrated approach of energy efficiency actions" (*Abordarea integrată a acțiunilor de eficiență energetică*), which was organised by the Society of Auditors and Energy Managers in Romania (SAMER) in Predeal. The event brought together auditors and energy managers who are authorised and certified by ANRE and who are members of SAMER.
- In 2018, under the energynomics.ro campaign entitled "Energy efficiency for results that matter" (*Eficiență energetică pentru rezultate care contează*), ANRE attended, as a speaker, the events dedicated to Energy Efficiency: "Innovation and verified solutions for energy efficiency" (*Inovație și soluții verificate pentru eficiență energetică*) in the following localities: Constanța, Craiova, Iași, and Timișoara. The event proposed to raise awareness and the level of understanding of the meaning of energy efficiency and of how energy efficiency can be improved, bringing together decision-makers among the public authorities in Romania and companies, from start-ups and SMEs to the largest undertakings, and energy experts.
- Letter No 82621/29 October 2018 was sent to the local public administration authorities with a population count between 5 000 and 20 000 inhabitants, but they failed to comply with the legal provisions;
- Letter No 82622/29/10/2019 was sent to the local public administration authorities with a population count over 20 000 inhabitants, but they failed to comply with the legal provisions;

149 local public authorities replied to these letters, however not all the replies were reflected in the submission of the EEIPs or updated tables.

Table 6 shows the situation of EEIPs' preparation/submission by TAUs to DEE, as follows:

Table 6

No	Number of inhabitants/ Type of locality	**Number of localities** on 1 July 2018 - according to the National Statistics Institute (*Institutul National de Statistica - INS*)	Number of localities which submitted **EEIPs** or tables	**Observations**	
				Number of localities which submitted **SEAPs (Sustainable Energy Action Plans)**	Number of localities which submitted **strategies**
1	**Over 20 000 inhabitants**	**107**	**41**	**2**	**1**
	Municipalities	88	39	2	0
	Cities	17	1	0	1
	Communes	2	1	0	0
2	**5 000 – 20 000 inhabitants**	**669**	**55**	**3**	**6**
	Municipalities	14	3	0	0
	Cities	179	25	3	5
	Communes	476	27	0	1
TOTAL		**776**	**96**	**5**	**7**

Source: ANRE

5.3. Monitoring of the energy efficient equipment market

Under **Article 3(2)(c) of Law No 121/2014 on energy efficiency, as subsequently amended and supplemented,** the duty of the Department for Energy Efficiency of ANRE is to supervise the market of equipment and appliances for which specific energy efficiency and ecodesign regulations are in place.

In order to check compliance with these provisions, the proposal of the *Control Programme for 2019* was prepared and submitted to the General Control Directorate. The proposal includes 11 control actions on site, which will follow up on compliance with the obligations regarding observance of the ecodesign and energy labelling specific legislation:

- **Government Decision No 917** of 5 September 2012 establishing certain measures for the application of Commission Delegated Regulation (EU) No 1059/2010, No 1060/2010, No 1061/2010, No 1062/2010 and No 626/2011 of 19 May 2010 supplementing Directive 2010/30/EU of the European Parliament and of the Council of 19 May 2010 on the indication by labelling and standard product information of the consumption of energy and other resources energy-related products and repealing certain legislative acts.

- **Government Decision No 671/2001** (as amended by Government Decisions No 230/2005 and No 1258/2007) establishing the requirements regarding the energy efficiency and labelling for placing on the market household combined washer-driers.
- **Government Decision No 456/2006** (as amended by Government Decisions No 1258/2007) establishing the requirements regarding labelling and energy efficiency for placing on the market household electric ovens.
- **Government Decision No 736/2006** (as amended by Government Decisions No 1258/2007) establishing the requirements regarding labelling and energy efficiency for placing on the market household electric tumble driers.
- **Government Decision No 55/2011** establishing the requirements for ecodesign applicable to energy-related products, as published in Official Gazette No 121 of 17 December 2011.
- **Government Decision No 1090/2013** designates **the National Energy Regulatory Authority** as the competent authority for market surveillance for the categories of products covered by Commission Regulation (EU) **No 327/2011 regarding fans driven by motors with an electric input power between 125 W and 500 kW.**
- Regulation (EU) No 1369/2017 of the European Parliament and of the Council of 4 July 2017 setting the framework for energy labelling and repealing Directive 2010/30/EU
- **Government Decisions No 640 and 641/2009,** which designate **the National Energy Regulatory Authority** as the competent authority for market surveillance for the categories of products covered by Commission Regulation (EU) **No 580/2011 regarding fans driven by motors and glandless standalone circulators and glandless circulators integrated in products.**
- **Government Decision No 1090/2013** establishing certain measures for the application of Commission Regulations (EU) No 327/2011, No 206/2012 and 547/2012 implementing Directive 2009/125/EC of the European Parliament and of the Council of 21 October 2009 establishing a framework for the setting of ecodesign requirements for energy-related products as regards the ecodesign requirements for fans driven by motors with an electric input power between 125 W and 500 kW, air conditioners and comfort fans and water pumps.

Having regard to *Law No 121/1 August 2014 on energy efficiency*, as subsequently amended and supplemented, and to *Government Decision No 580/2011 establishing certain measures for the application of Commission Regulation (EC) No 641/2009*, in accordance with the duties of the Energy Efficiency Monitoring Service, as set out in the *ANRE's Rules of Order and Functioning*, following the notification submitted by a law firm, as regards the fact that four economic operators fail to comply with the requirements for placing on the market regarding ecodesign, which are provided by Article 3 of Commission Regulation (EC) No 641/2009, ANRE performed a compliance check at these economic operators with regard to observance of the legislation in force.

For this purpose, ANRE requested the complete technical documentation for all the products sold by the four operators. The checks revealed that:

- three operators sell circulation pumps used in the recirculation of drinking water. All of the three companies comply with the requirements of Commission Regulation (EC) No 641/2009 of 22 July 2009.
- One operator does not comply with the requirements of Commission Regulation (EC) No 641/2009 for a type of product. The operator declared that it sold out this type of products and that it will only import drinking water pumps which comply with the legislation in force.

Actions involving international cooperation and know-how transfer were achieved in 2018 in order to disseminate the legislative information and to bring all the stakeholders to the same table, i.e. representatives of authorities, of producers, of distributors and of traders.

DEFE of ANRE is a member of the European project consortium INTAS (Industrial and tertiary product Testing and Application of Standards).

In accordance with the provisions of Contract 695943 — INTAS — H2020-EE-2014-2015/H2020-EE-2015-3-MarketUptake, WP 6, Task 6.2. In June 2018, DEFE of ANRE organised *the second national meeting of the National Focal Point* of the INTAS project in Bucharest. The purpose was to disseminate the interim results achieved with the development of the INTAS project and to foster facilitation of direct communication among various stakeholders on the Romanian market, which are involved in the implementation of the Ecodesign Directive requirements. Moreover, account was also taken of raising awareness of the use of energy efficient technologies and of the best practical solutions in the Romanian industry. 63 persons, as representatives of the market surveillance authorities, producers, traders and users of transformers and fans, producer and consumer associations, energy consultants, decision-makers, energy agents etc. attended the event.

In order to disseminate the activity and the European energy efficiency news on the website of ANRE, in 2018 all the files and materials prepared under the INTAS project were uploaded thereto - http://www.anre.ro/ro/eficienta-energetica/informatii-de-interes-public/info-eficienta-energetica1386850500/proiecte/proiectul-industrial-and-tertiary-product-testing-and-application-of-standards-intas

The data and information under the INTAS project are and will be used by the national teams and European institutions such as: DG Energy of the EC, the European Environment Agency, in its energy and environmental reports, IEA and the International Energy Agency.

Moreover, in 2018, DEFE of ANRE attended the two meetings of the Horizon 2020 project consortium (INdustrial and tertiary product Testing and Application of Standards - INTAS) in Madrid, Spain in March and in Rome, Italy in October.

The following were prepared under the INTAS project:

1. guidelines with methodologies designed for market surveillance authorities for the performance of compliance checks on large industrial equipment, transformers and fans placed on the market or mounted at users
   http://intas-testing.eu/storage/app/media/INTAS_D4.1_Final.pdf
   http://intas-testing.eu/storage/app/media/INTAS_D4.2_Final.pdf
2. guidelines for producers and distributors of equipment in the industry, guidelines required in order to establish the strategies for assessing compliance with guidelines, which mitigate the disturbance of the market entry
3. a series of concrete and pragmatic recommendations aimed at providing the market surveillance authorities with a complete package of control options which are needed in order to approach the non-compliance of large industrial equipment in an adequate manner
   http://intas-testing.eu/storage/app/media/INTAS_D4.4_%20Final.pdf

ANRE is a member of the ADCO (Administrative Cooperation) **working group -** a group of experts set up by the European Community to activate, for compliance with the requirements of the two directives applicable to energy-related products, namely Directive 2009/125/EC establishing a framework for the setting of ecodesign requirements for energy-related products and Regulation (EU) 2017/1369 of the European Parliament and of the Council of 4 July 2017 setting a framework for energy labelling and repealing Directive 2010/30/EU.

The ADCO group of experts establish and enable, in a coherent manner, information exchange at EU level with a view to ensuring the application of all the regulations on ecodesign and energy labelling.

The ADCO group organises two meetings annually, in spring and in autumn, which are attended by experts from Member States and where discussions revolve around the in-house issues of the group (how the market surveillance activities for energy labelling and ecodesign are performed in

the EU Member States, information about the stage of development of the European projects financed under the Horizon 2020 in the fields of ecodesign/energy labelling, issues related to non-compliant interpretations of the relevant legislative provisions in force, information about legislative initiatives which are to be issued or amended in ecodesign/energy labelling, common positions on non-compliances/breaches of the law identified on energy-related products, the presentation of activity reports by the two working groups, i.e. the ecodesign/energy labelling group, discussions about the ambiguities in the approach of the relevant legislative provisions - Grey Area Questions, adoption of minutes pertaining to previous meetings, approval/rejection of previously discussed proposals by vote etc.).

At international level, ANRE attends the meetings of the working groups of ADCO for the issues of energy labelling and ecodesign:

- ADCO - Eco-design – Directive 2009/125/EC (ECOD);
- ADCO Energy Labelling – Directive 2010/30/EU and Regulation (EU);
- 2017/1369 (ENERLAB).

Moreover, ANRE attends meetings of the EnR group (the European network of energy efficiency agencies) for energy labelling and ecodesign (videoconferencing).

5.4. Monitoring of the National Energy Efficiency Action Plan (NEEAP)

In accordance with Article 8(8) of Law No 121/2014 on energy efficiency, as subsequently amended and supplemented, the Energy Efficiency Department of ANRE prepares, by 30 April, an annual follow-up report on the NEEAP implementation based on the reports received from the institutions involved in the implementation of this law by 30 March.

The 2014-2020 National Energy Efficiency Action Plan (NEEAP III) was approved by Government Decision No 122/2015 and the updated version of the 2017-2020 National Energy Efficiency Action Plan (NEEAP IV) was submitted to the European Commission in December 2017. Government Decision No 203/3 April 2019 approving NEEAP IV was published in Official Gazette Nos 273 and 273 bis of 10 April 2019.

Compared to NEEAP III, which was implemented under 12 national energy efficiency programmes, the 2017-2020 NEEAP IV is structured by two components and contains new economic sectors: construction and agriculture

1. The 2017-2020 National Energy Efficiency Action Plan for the Electricity Supply System
    - National Investment Plan
    - OTC reduction in DN (distribution network)
    - OTC reduction in TN (transport network)
    - Promotion of high-efficiency cogeneration
    - Further implementation of the “District heating 2006-2020 - Heat and Comfort” programme

2. The 2017-2020 National Energy Efficiency Action Plan for the Final Energy Consumer. (Article 7 of Directive 2012/27/EU on energy efficiency)
    - Smart metering
    - Energy efficiency in the industrial sector
    - Energy efficiency in the construction sector
    - Energy efficiency in the residential sector
    - Energy efficiency in the services sector
    - Energy efficiency in the transport sector

- Energy efficiency in the agriculture sector

In accordance with Article 8(8) of Law No 121/2014 on energy efficiency, as subsequently amended and supplemented, the Energy Efficiency Department of ANRE prepares, by 30 April, an annual follow-up report on the NEEAP implementation based on the reports received from the institutions involved in the implementation of this law by 30 March, which is published on the ANRE website.

In this context, ANRE requested from the following institutions the data needed to prepare the 2018 report: MDRAP - Ministry of Regional Development and Public Administration, ME - Ministry of Energy, MEc - Ministry of the Economy, AFM- Environmental Fund Administration, MFE - Ministry of European Funds, MT – Ministry of Transport and the Ministry of Agriculture and Rural Development.

Also, information was requested from the specialised directorates of ANRE with regard to the energy efficiency increase in electricity networks, the promotion of high-efficiency cogeneration and smart metering.

In the preparation of this report, data was used from the Follow-up Report on the work of auditors and energy managers and from the Follow-up Report on final energy consumers, which are prepared by the Energy Efficiency Department. At the same time, data was requested from the mayor's offices in the localities with more than 5 000 inhabitants on the energy savings achieved following the application of measures for the thermal rehabilitation of public buildings, the improvement of public lighting efficiency and the public water supply system.

Based on the statistical data and the reports received for the 2018 actions, the main fields where significant energy savings have been achieved are:

A. The energy supply system

• The main objective of **the National Investment Plan (NIP)** is to ensure environmental protection through a reduction in greenhouse gas emissions for producers of electricity based on fossil fuel and the secondary objective is to ensure energy efficiency by retrofitting the polluting energy sector. The transitional derogation allows for a transitional free allocation for the purpose of retrofitting the production of electricity in the respective country in the period 2013-2020.

In this context, Romania has been entitled to the following, since December 2012:

- a mechanism for the transitional free allocation of greenhouse gas certificates for 39 polluting producers of electricity for the period 2013-2020;
- ex post grants for 29 investments authorised by the European Commission, which are achieved after 25 June 2009 in order to retrofit the electricity production system in Romania, designated as the National Investment Plan (NIP).

The project is developed until 2020 and investments are further monitored for five years from the commissioning of the respective investment or the date of conclusion of the financing agreement.
The National Investment Plan, which was authorised by the European Commission, comprises investments for the retrofitting of the energy sector under the two abovementioned Commission Decisions. The investments were selected under an open, transparent and non-discriminatory procedure. The selected investments include a series of new gas plants, investments to retrofit the coal and lignite-powered electricity production system.

The project is extremely important for polluting producers of electricity in Romania, all the more so as the European Commission is currently debating the draft version of the new post 2020 EU-ETS Directive which will produce effects until 2030 (setting up a Retrofitting Fund - funded by EIB for the shift towards a low-carbon economy).

The two EC Decisions and Article 60(3) of Law No 226/2013 approving Government Order No 164/2008 amending and supplementing Government Order No 195/2005 on environmental protection underlay the adoption of Government Decision No 1096/2013 approving the mechanism for transitional free allocation of greenhouse gas certificates for producers of electricity, for the period 2013-2020, including the National Investment Plan.

Government Emergency Order No 30/2015 regarding certain measures for the implementation of the mechanism for the transitional free allocation of greenhouse gas certificates for 39 polluting producers of electricity for the period 2013-2020, including the National Investment Plan (Government Emergency Order No 30/2015), provided for the legal and institutional framework which ensures the follow-up on and the implementation of the investments in the NIP.

Two investments have been completed to this date for

- **RO-015**: The combined cycle gas turbine in Brazi, with OMV Petrom as beneficiary, which started its commercial operation in August 2012, was commissioned in 2017 and its electricity production was 3 925.431 MWh;
- **RO-025**: The rehabilitation and retrofitting of the 330 MW lignite-powered energy block No 4 - Rovinari Power Station. After retrofitting and refurbishment, the block was commissioned in 2015 and its commercial operation started in 2017. Electricity production amounted to 2 119.678 MWh.

and the value of the savings achieved in 2018 under this programme is 362 938 toe.

• **Increase in the energy efficiency in networks through:**

✓ OTC reduction in the electricity and gas distribution networks

ANRE regulated the reduction targets for the OTC rates in the EDN according to the data in **Table 7** (%) and **Table 8** (unit of energy [MWh]).

Table 7

Distribution operator	OTC 2018 [%]					
	HV		MV		LV	
	achieved	target	achieved	target	achieved	target
E-Distribuţie Muntenia	0.59	0.59	3.09	3.40	14.43	15.34
E-Distributie Banat	0.79	0.63	3.16	3.54	13.51	14.14
E-Distributie Dobrogea	1.55	1.71	4.90	4.24	12.48	13.21
Distributie Energie Oltenia	1.22	1.14	3.97	3.97	15.14	17.00
Delgaz Grid	0.93	0.96	2.66	2.80	14.74	16.00
SDEE Muntenia Nord	1.23	0.95	5.54	5.25	13.95	13.60
SDEE Transilvania Nord	0.99	0.96	4.36	4.00	10.42	10.20
SDEE Transilvania Sud	1.12	0.98	3.68	3.90	15.14	14.80

Source: ANRE

Table 8

Distribution operator	DESIGNATION	TOTAL YEAR 2018			
		HV (MWh)	MV (MWh)	LV (MWh)	TOTAL (MWh)
E-Distribuţie Muntenia	OTC total	53,800	258,021	703,027	1,014,847
E-Distributie Banat	OTC total	44,515	138,663	337,725	520,903
E-Distributie Dobrogea	OTC total	82,940	172,837	257,855	513,632
Distributie Energie Oltenia	OTC total	115,432	236,047	514,937	866,416
Delgaz Grid	OTC total	50,053	130,049	479,681	659,784
SDEE Muntenia Nord	OTC total	80,626	348,702	451,027	880,356
SDEE Transilvania Nord	OTC total	58,391	238,981	324,610	621,982
SDEE Transilvania Sud	OTC total	80,514	219,950	460,410	760,874

Source: ANRE

For 2018, the electricity distribution companies reported energy savings of 4 941 toe through the EEIP, as shown in Table 9.

Table 9

	Electricity distribution company	No of measures	Energy saving [toe]	Investment value [RON]
1	Distribuţie Energie Oltenia	22	713.044	80 822 180
2	SDEE Muntenia Nord	62	125.060	23 835 850
3	SDEE Transilvania Nord	44	763.000	107 274 000
4	SDEE Transilvania Sud	15	189.640	10 199 990
5	E-Distribuție Banat	6	823.290	54 626 830
6	E-Distribuție Dobrogea	5	805.940	81 065 980
7	E–Distribuție Muntenia	5	1 102.680	69 076 800
8	Delgaz Grid	13	418.000	121 400,000
TOTAL		**172**	**4 940.654**	**548 301 630**

Source: ANRE

The main energy efficiency improvement measures adopted by distribution operators were:

- securing/replacing measurement units;
- implementing smart measurement systems;
- balancing network phase loading;
- reconfiguring/optimising the LV network;
- retrofitting branches by mounting FDCP (level distribution and metering box)/measurement and protection blocks (BMP) at property boundaries;
- retrofitting transformation posts and stations;
- retrofitting the aerial power lines (LEA) and the underground power lines (LES);
- replacing the transformation post (PT), low voltage aerial power lines (LEA JT) and medium voltage underground power lines (LES MT);
- increasing the quantity of power transformers/voltage control;
- replacing the existing medium voltage/low voltage (MT/JT) transformers with low loss transformers;
- adjusting transformation plots (MT/JT);
- improving the voltage level by MT/JT injection and/or creation of new outputs.

The assessment of the energy efficiency improvement programme (EEIP), which was reported by Delgaz Grid, revealed that the following types of measures, which led to the reduction of the technological consumption (TC), were implemented, namely: the maintenance of the network in accordance with the technical rules in force; the use of highly efficient technologies and modern equipment in the loss verification process and in the interventions to the networks, which enable to remove voltage only from the targeted sections or even the avoidance of such removal, implicitly without being necessary to empty/fill the pipes and to cease the supply of gas to consumers. For 2018, Delgaz Grid reports investments of RON 148 000 000 in the grid, which results in estimated energy savings of 4 363 toe.

✓ <u>OTC reduction in the electricity and gas transmission grids</u>

The National Electricity Transport Company “Transelectrica” SA operates, develops and protects the electricity transmission grid (ETG), which comprises power stations and lines, with a nominal line voltage above 110 kV.

The amount of units managed by CNTEE Transelectrica SA includes 81 power stations, 8 985 km of aerial power lines and 218 transformation units, totalling 38 000 MVA.

The power lines and stations forming the national transport system were mostly built in the years 1960-1980 at the technological level of that time. However, the actual technical condition of the units has maintained at an appropriate level following the implementation of a thorough maintenance programme and of a sustained refurbishment and retrofitting programme.

The adopted energy efficiency improvement measures are in accordance with the 2018-2027 ETG Development Plan which, in turn, is correlated with the European ETG Development Plan (TYNDP 2018-2027).

The National Natural Gas Transport Company “Transgaz” S.A. aims at implementing the national strategy established for the transport, international transit, the demand response of natural gas and the research-design in the area of natural gas transport. SNTGN Transgaz SA is the technical operator of the national natural gas transport system and is responsible for its operation under conditions of quality, safety, economic efficiency and environmental protection.

The assessment of the energy efficiency improvement programme (EEIP), which was reported by SNTGN Transgaz SA, reveals that measures were or are to be implemented in order to reduce TC. The Sinca natural gas compression stations was repowered and it has an annual saving potential of approximately 250 toe. The measures which will be implemented in the period 2018-2022 concern:

- providing for the justification of development and retrofitting projects based on energy audits;
- including energy efficiency criteria in the technical specifications of the products purchased in order to retrofit the activity;
- producing electricity through the recovery of energy from the expansion of natural gas.

The reduction of OTC in electricity and natural gas transmission grids resulted in energy savings of 438 toe.

- Promotion of high-efficiency cogeneration

In 2018, a series of relevant regulations were issued for the development of the programme for the promotion of high-efficiency cogeneration, as follows:

- Order No 19/2018 of ANRE applying for 2017 Articles 21(2) and 27 of the Regulation for qualifying the production of electricity from high-efficiency cogeneration and for verification and monitoring of fuel consumption and useful electricity and heat production in high-efficiency cogeneration, as approved by Order No 114/2013 of the President of the National Energy Regulatory Authority, and Articles 21-23 of the Regulation establishing the method of collection of the contribution for high-efficiency cogeneration and the method of payment of the bonus for electricity produced in high-efficiency cogeneration, as approved by Order No 116/2013 of the National Energy Regulatory Authority
- Order No 114/2018 of ANRE amending Order No 123/2017 of the President of the National Energy Regulatory Authority approving the contribution for high-efficiency cogeneration and certain provisions on the invoicing thereof
- Order No 180/2018 of ANRE amending and supplementing the Methodology for the determination and adjustment of prices in electricity and heat produced and supplied from cogeneration units, which are covered by the support scheme, and of the bonus for high-efficiency cogeneration, as approved by Order No 15/2015 of the President of the National Energy Regulatory Authority
- Order No 182/2018 of ANRE approving the reference price for the electricity produced in high-efficiency cogeneration, as applicable in 2019 to producers of electricity and heat from cogeneration, which are entitled to a bonus
- Order No 183/2018 of ANRE approving the reference bonus values for the electricity produced from high-efficiency cogeneration and the reference prices for the heat from cogeneration, which are applicable in 2019
- Order No 190/2018 of ANRE supplementing the Methodology for the determination and monitoring of the contribution for high-efficiency cogeneration, as approved by Order No 117/2013 of ANRE
- Order No 192/2018 amending Order No 123/2017 approving the contribution for high-efficiency cogeneration and certain provisions on the invoicing thereof - which approved the contribution applicable in the period 20 November-31 December 2018
- Order No 206/2018 of ANRE amending Order No 123/2017 of the President of the National Energy Regulatory Authority approving the contribution for high-efficiency cogeneration and certain provisions on the invoicing thereof

The values of the primary energy savings in high-efficiency cogeneration with reference to separate production of electricity and heat, as achieved in 2018 by producers accessing the cogeneration support scheme, are listed in Table 10.

Table 10

MU	QUARTER I		QUARTER II		QUARTER III		QUARTER IV		**Total in 2018**	**Total in 2017**
	2018	2017	2018	2017	2018	2017	2018	2017	**2018**	2017
GWh	1 212	1 181	385	440	285	285	854	989	**2 736***	2 864
toe	104 232	101.566	33 110	37.840	24 510	24.510	73 444	85.054	**235 296***	246.304

Source: ANRE

*The regulated value after the annual qualification calculation is found in Table 9.

The support scheme for the promotion of high-efficiency cogeneration was established in Romania under Government Decision No 219/2007 on the promotion of cogeneration based on useful heat, as subsequently amended and supplemented (national transposition of Directive 2004/8/EC on the promotion of cogeneration based on a useful heat demand in the internal energy market and amending Directive 92/42/EEC which, as of 5 June 2014, was replaced by Directive 2012/27/EU), and implemented by Government Decision No 1215/2009 establishing the criteria and conditions required for the implementation of the support scheme for the promotion of high-efficiency cogeneration based on the useful heat demand, as subsequently amended and supplemented.

The bonus scheme accounts for a State aid (N 437/2009 - Romania), being authorised by the European Commission as compatible with the common market, in accordance with Article 87(3)(c) of the EC Treaty, under Decision C(2009)7085, as amended by Decision C(2016)7522 final. The authorisation was communicated by publication in the Official Journal of the European Union C31/9.2.2010. The bonus type support scheme entered into force effectively on 1 April 2011.

Government Decision No 494/2014 amending and supplementing Government Decision No 925/2016 amending and supplementing Government Decision No 1215/2009, Government Decision No 129/2017 supplementing Article 8 of Government Decision No 1215/2009 provided for the supplementation of the legal framework for the application and implementation of the support scheme for the promotion of high-efficiency cogeneration based on the useful heat demand with a view to achieving consistency with the specific provisions of the 2014-2020 Guidelines on State aid for environmental protection and energy (EEAG) and Council Regulation (EU) 2015/1589 laying down detailed rules for the application of Article 108 of the Treaty on the Functioning of the European Union.

Government Decision No 494/2014 amending Government Decision No 1215/2009 *establishing the criteria and the conditions required for the implementation of the support scheme for the promotion of high-efficiency cogeneration based on the heat demand* provides that suppliers supplying electricity for export are exempted from the payment of the contribution for high-efficiency cogeneration, more specifically of the single tariff expressed in RON/kWh, which is paid on a monthly basis.

In accordance with Government Decision No 925/2016, the support scheme is applied only to producers of electricity and heat from cogeneration requesting from ANRE to grant such support for the electricity produced from high-efficiency cogeneration for the cogeneration capacities included on the List referred to in Article 9(4) by 31 December 2016, and for new cogeneration facilities replacing, before 31 December 2016, existing cogeneration facilities having received the bonus for the high-efficiency electricity within the limit of the installed electricity capacity included on 31 December

2016 on the List referred to in Article 9(4) for every producer acting as a beneficiary of the support scheme.

Government Decision No 846/2018 amending and supplementing Government Decision No 1215/2009 provides that the values of bonuses and the prices in heat granted to producers of electricity from high-efficiency cogeneration should be adjusted, and the selling price for the electricity produced from high-efficiency cogeneration should be determined on a quarterly basis, instead of annually, and the prices for heat and the bonuses determined for the following year should also be applied for November and December of the current year.

Moreover, Government Decision No 846/2018 provides for the method of application of certain discounts to the bonuses for November and December of the current year as per the assessment of the costs and revenues estimated by each producer in the fourth quarter of the previous year, and for the method of reduction of the bonuses established for the second quarter as per the results of the ante-overcompensation assessment for that year.

At the same time, Government Decision No 846/2018 provides that, in order to ensure the necessary funds for the payment of the bonuses applicable to November and December, ANRE establishes the contribution for high-efficiency cogeneration applicable to November and December of the current year by considering the demand for revenues for the payment of the bonus for this period.

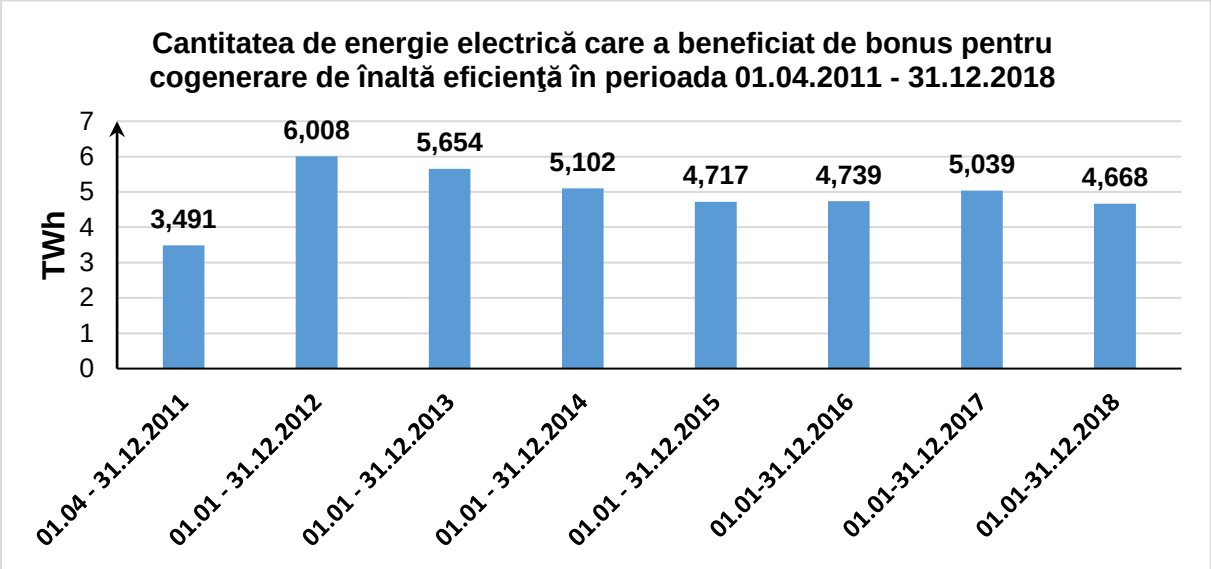
The main regulatory action lines in the promotion of electricity produced from high-efficiency cogeneration for 2018 were:

a) to prepare rules enabling the application of the bonus type scheme established under Government Decision No 219/2007 on the promotion of cogeneration based on the useful heat demand, and to implement into the secondary legislation the amendments of Government Decision No 1215/2009 establishing the criteria and the conditions required for the implementation of the support scheme for the promotion of high-efficiency cogeneration based on the useful heat demand, and the follow-up on the application thereof;
b) to issue decisions amending the List of capacities producing electricity and heat from cogeneration, with final accreditation;
c) to issue monthly/annual decisions approving the amounts of electricity produced from high-efficiency cogeneration entitled to a bonus;
d) to issue decisions for overcompensating the production of electricity and heat from high-efficiency cogeneration for the evaluation period from 1 January 2017 to 31 December 2017;
e) to conduct the ante-overcompensation assessment for the evaluation period from 1 January 2019 to 31 December 2019 - ANRE assesses the costs and revenues for the production of electricity from high-efficiency cogeneration and of heat from cogeneration, which are estimated for the following year for each producer entitled to the support scheme and, based on the results achieved, the bonuses for each producer are approved for the following year;
f) to issue the decisions approving the bonus for electricity and the regulated prices for the electricity and heat produced from high-efficiency cogeneration for November-December of 2018 and 2019;
g) to issue opinions approving the prices for heat based on the formulas for determining/adjusting the price for the heat produced and supplied from cogeneration units where operators and the local public administration have chosen to determine the price for heat on the basis of formulas, and to issue opinions approving the regulated prices for heat from cogeneration determined on the basis of these formulas;
h) to issue opinions for the preliminary/final accreditation of new projects or of projects for the repowering of cogeneration units;
i) to perform analyses in order to adjust the contribution for the second semester of 2018, November and December of 2018 and to determine the value of the contribution for cogeneration as of 1 January 2019.

For the 36 producers concerned, the total amount of electricity produced from high-efficiency cogeneration, for which a bonus was received for January-December 2018, was 4.536 TWh before the

regulation of March 2019 and 4.668 TWh after the regulation in March 2019, with a 7.36 % decrease compared to the value for 2017 - according to Figure 9.

Figure 9



Source: ANRE

RO	EN
Cantitatea de energie electrică care a beneficiat de bonus pentru cogenerare de înaltă eficiență în perioada 01.04.2011 - 31.12.2018	The amount of electricity entitled to a bonus for high-efficiency cogeneration in the period between 1 April 2011 and 31 December 2018

32 decisions were issued in March 2018 for the qualification of the amount of electricity produced from high-efficiency cogeneration and supplied from the power plants which benefitted from the support scheme for January-December 2017.
The decisions underlay the regulation of payments corresponding to the bonus for January-December 2017 by CN Transelectrica SA. The qualified amount for 2017, which was cumulated for the 36 producers, was 5.039 TWh.

In March 2018, **three decisions** were issued for the overcompensation of the production of electricity and heat from high-efficiency cogeneration for the evaluation period between 1 January 2017 and 31 December 2017 and four decisions on the regulation of ante-overcompensation following the assessment of the overcompensation of the production of electricity and heat from high-efficiency cogeneration for the evaluation period between 1 January 2017 and 31 December 2017.

Following the assessment of the overcompensation of the production of electricity and heat from high-efficiency cogeneration for the evaluation period between 1 January 2017 and 31 December 2017, it was noted that, following the application of the support scheme for the indicated period for 42 units producing electricity and heat from cogeneration (operated by 33 producers), the overcompensation of the production of electricity and heat from cogeneration was recorded in 6 plants (3 producers), with a total amount of RON 140 341 573, and in 4 plants (4 producers) cases were recorded as regards the regulation of the ante-overcompensation for the period between 1 January 2017 and 31 December 2017, with a total amount of RON 6 060 375.

The decisions of the President of ANRE regarding the amount of overcompensation underlay the decisions and invoices issued by CN Transelectrica SA to recover the overcompensation value for the production of electricity and heat in high-efficiency cogeneration for the evaluation period between 1 January 2017 and 31 December 2017, as established.

In September 2018, a decision was approved for the bonus for the electricity produced from high-efficiency cogeneration and supplied to the National Energy System (NES) in 2018 for a new plant which replaced, on the same site, existing cogeneration facilities having received the bonus for electricity with high-efficiency cogeneration facilities within the limit of the installed electricity capacity included on 31 December 2016 on the *List of facilities producing electricity and heat from cogeneration with final accreditation*.

In November 2018, the following decisions were issued: **24 approving decisions** establishing the value of the bonus for the electricity produced from high-efficiency cogeneration and the values of the regulated prices in heat supplied from cogeneration units accessing the support scheme for 2019 and November-December 2018, **12 approving decisions** establishing the value of the bonus for the electricity produced from high-efficiency cogeneration in NES from cogeneration units which accessed the support scheme for 2019 and November-December 2018, **two approving decisions** establishing the value of the regulated prices for the heat supplied from cogeneration units which do not access the support scheme for the first semester of 2019. The bonuses established for November-December 2018 were reduced as applicable, according to the results of the ante-overcompensation assessment of 2017 for 2018.

The ante-overcompensation assessment of the fourth quarter of 2018 revealed that, from the application of the support scheme for 2019 for 36 producers of electricity and heat from cogeneration, overcompensation for the production of electricity and heat from cogeneration is recorded for one producer. Consequently, a decision was issued to reduce the bonus for the amount of electricity produced from high-efficiency cogeneration and supplied to the NES grids in 2019 from the power plant owned by the respective producer, compared to the reference bonus, for the year of operation under the support scheme, and the main fuel used, and approved by Order No 183/2018 of ANRE. The bonus reduction for November-December 2018 was also applied to the same producer.

Based on the accreditation documentation submitted in accordance with the *Procedure for endorsement*, as approved by Order No 115/2013 of ANRE, as subsequently amended and supplemented, **one opinion** was issued in 2018 for the **final accreditation** of a new cogeneration unit with an installed electricity capacity of 4.401 MW, which replaces, on the same site, **another facility which benefitted from the support scheme, but was decommissioned.**

The value of the contribution for the second semester of 2018 was revised following the June 2018 evaluation of the accrued costs and revenues under the support scheme, and of the forecast costs for the second semester of 2018, **and it is RON 7.63/MWh**, without VAT, as approved by Order No 114/2017 of ANRE. A decisive factor in the reduction of the contribution from the determined value of RON 11.94/MWh, without VAT, as approved by Order No 123/2017 of ANRE, was the consideration of the amount of overcompensation for the evaluation period between 1 January 2017 and 31 December 2017 as revenue under the support scheme.

Following the additions of Order No 190/2018 of ANRE to the Methodology for determining and monitoring the contribution for high-efficiency cogeneration, as approved by Order No 117/2013 of ANRE for 2018, **the contribution value was RON 10.51/MWh as from 20 November 2018**, without VAT, as approved by Order No 192/2018 of ANRE. The increase was due to the increase in

the revenues demand for the payment of the bonus following the increase in the levels of bonuses applicable in the period between 22 November and 31 December 2018.

The provisions of Order No 206/2018 of ANRE are effective **as of 1 January 2019** and **the value of the contribution for cogeneration is RON 11.86/MWh**, without VAT. The increase was due to the increase in the revenues demand for the payment of the bonus following the increase in the levels of bonuses applicable from January onward.

The data related to the monitoring of the support scheme for cogeneration for 2011, 2012, 2013, 2014, 2015, 2016, 2017 and 2018 is set out in **Table 11.**

Table 11 - Results of the application of the support scheme for 2011-2018

Indicator	**MU**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**
Total value of the contribution invoiced to consumers and exporter suppliers 1)	thousand RON	690 931	928 877	1 072 840	770 626	757 447	708 194	624 519	519 931
The amount of electricity invoiced to final consumers (including that consumed by suppliers and producers under own supply/own consumption) to which the cogeneration contribution was applied	GWh	32 639	46 450	44 930	45 457	46 476	47 103	48 669	50 145
The amount of exported electricity to which the cogeneration contribution was applied	GWh	1 465	1 108	1 959	3 310 [1)]	0 [1)]	0 [1)]	0 [1)]	0 [1)]
Amount of electricity produced from high-efficiency cogeneration, for which the support scheme was granted	GWh	3 491	6 008	5 654	5 102	4 717	4 739	5 039	4 668
The total value of the bonuses due to the producers in cogeneration entitled to the bonus type scheme	thousand RON	594 473	978 098	1 098 112	927 234	896 796	887 761	842 872	611 658
The amount of imported electricity with guarantees of origin for production of electricity from high-efficiency cogeneration, for which the return of the contribution was requested	GWh	0	0	0	0	0	0	0	0
Fuel saving achieved in high-efficiency cogeneration processes benefitting from the bonus in accordance with the qualifying regulation	GWh	2 131	3 498	3 430	3 016	2 623	2 751	2 864	2 702

Source: ANRE

1) Government Decision No 494/2014 amending Government Decision No 1215/2009 establishing the criteria and conditions required for the implementation of the support scheme for the promotion of high-efficiency cogeneration based on the heat demand provides that suppliers which supply electricity for export are exempted from the payment of the contribution for high-efficiency cogeneration, more specifically of the single tariff expressed in RON/kWh, which is paid on a monthly basis.

The single bonuses for the electricity produced from high-efficiency cogeneration in 2018 (for the 8th year of entitlement) with the value of:

- **RON 124.31/MWh** for the units using predominantly natural gas from the transmission grid with a commissioning date before 1 January 2016;
- **RON 127.23/MWh** for the units using predominantly natural gas from the transmission grid with a commissioning date after 1 January 2016;
- **RON 135.95/MWh** for the units using predominantly natural gas from the distribution grid with a commissioning date before 1 January 2016;
- **RON 139.30/MWh** for the units using predominantly natural gas from the distribution grid with a commissioning date after 1 January 2016;
- **RON 119.90/MWh** for units using predominantly solid fuel,

were approved by Order No 99/2017 of ANRE and applied in the period between 1 January 2018 and 22 November 2018.

The reference bonuses in the period between 22 November and 31 December 2018 [for the 9th year of entitlement, in accordance with Article 25(3) of Government Decision No 1215/2009, as subsequently amended and supplemented] were worth:

- **RON 153.16/MWh** for the units using predominantly natural gas from the transmission grid with a commissioning date before 1 January 2016;
- **RON 156.47/MWh** for the units using predominantly natural gas from the transmission grid with a commissioning date after 1 January 2016;
- **RON 157.39/MWh** for the units using predominantly natural gas from the distribution grid with a commissioning date before 1 January 2016;
- **RON 160.95/MWh** for the units using predominantly natural gas from the distribution grid with a commissioning date after 1 January 2016;
- **RON 169.13/MWh** for units using predominantly solid fuel,

were approved by Order No 183/2018 of ANRE and applied in the period between 22 November and 31 December 2018.

During 2018, the company VEOLIA ENERGIE IASI SA, for CET Iasi I, which is a producer of electricity and heat from cogeneration, as a beneficiary of the support scheme, replaced, on the same site, existing cogeneration facilities having received the bonus for electricity with high-efficiency cogeneration facilities within the limit of the installed electricity capacity included on 31 December 2016 on the List of facilities producing electricity and heat from cogeneration with final accreditation.

Based on the operation data for 2017, which was submitted by the producers from cogeneration in 2018, the following were assessed in accordance with Article 13(3) of Government Decision No 219/2007 on the promotion of cogeneration based on the useful heat demand, as subsequently amended and supplemented:

- the outputs of electricity and heat from cogeneration based on the calculation method referred to in Annex II to Directive 2004/8/EC (currently replaced by Annex I to Directive 2012/27/EU) - (**Table 12**);
- the cogeneration (electricity/heat) facilities (**Table 13**);
- the quantities of fuel used for heat and electricity production from cogeneration (**Table 14**);

- the quantities of electricity produced from high-efficiency cogeneration and primary energy savings obtained from the use of high-efficiency cogeneration, established as per Annex III to Directive 2004/8/EC (currently replaced by Annex II to Directive 2012/27/EU) - (**Table 15**):

Table 12 - National production of electricity and heat from cogeneration

Year	Total electricity produced in cogeneration units	Electricity produced from cogeneration (Annex II to Directive 2004/8/EC, replaced by Annex I to Directive 2012/27/EU)		Electricity produced from cogeneration in the total national production	Useful heat produced in cogeneration units (Annex II to Directive 2004/8/EC, replaced by Annex I to Directive 2012/27/EU)	
		Total	of which Own energy producers		Total	of which Own energy producers
	TWh	TWh	%	%	Legal persons	%
2007	14.23	6.62	14.65	10.7	73.2	15.85
2008	14.06	6.21	15.62	9.6	71.5	18.04
2009	12.33	6.26	13.74	10.8	66.3	17.50
2010	11.93	6.54	17.74	10.8	69.0	22.46
2011	13.47	7.28	17.45	11.9	71.9	23.50
2012	12.54	6.72	16.07	11.4	66.1	22.37
2013	11.1	6.6	18.78	11.3	57.9	21.99
2014	10.7	6.1	19.38	9.4	55.4	21.86
2015	9.2	5.6	16.07	8.5	51.0	18.43
2016	8.90	5.29	10.78	8.2	45.9	13.07
2017	8.94	5.81	13.25	9.1	48.3	13.66

Source: ANRE

Table 13 - Facilities producing electricity and heat from cogeneration in Romania in 2017

Cogeneration technology	Maximum capacity	
	Electricity	Heat
	Gross	Net
	MW	MW
Gas turbines in combined cycle, with heat recovery	225	227
Gas turbines with heat recovery	173	250
Internal combustion engines	187	165
Steam backpressure turbines	715	2 980
Steam condensing turbines with cogeneration sockets	2 840	5 298
Other cogeneration technologies	3	10
TOTAL	4 143	8 930

Source: ANRE

Table 14 - Amounts of fuel used for production of electricity and heat from cogeneration

Year	Total fuel used by cogeneration units	Fuel used for cogeneration (Annex II to Directive 2004/8/EC, replaced by Annex I to Directive 2012/27/EU)	of which:				
			Solid fossil fuel	Fuel oil	Natural gas	Renewable sources and waste	Other fuels
	Legal persons	Legal persons	%	%	%	%	%
2007	221.4	122.8	38.2	8.3	52.8	0.0	0.7
2008	216.8	118.1	39.5	6.3	52.8	0.0	1.4
2009	188.6	112.4	39.8	6.9	49.7	0.5	3.1
2010	186.1	117.3	38.6	3.8	50.8	1.9	4.9
2011	200.3	124.3	38.2	3.5	52.4	2.0	3.9
2012	188.5	114.5	38.4	3.3	53.7	2.0	2.7
2013	159.7	103.6	37.4	0.6	54.6	3.6	3.8
2014	154.1	97.7	36.0	0.5	54.4	5.4	3.7
2015	135.0	90.3	34.9	0.8	54.8	6.4	3.1
2016	128.0	82.2	28.5	1.4	59.8	6.4	3.9
2017	125.1	87.2	24.0	0.3	64.7	5.5	5.5

Source: ANRE

Table 15 - Production of electricity from high-efficiency cogeneration and primary energy savings from the use of high-efficiency cogeneration

Year	Electricity from high-efficiency cogeneration (Annex III to Directive 2004/8/EC replaced by Annex II to Directive 2012/27/EU)	Consumption of fuel in high-efficiency cogeneration (Annex III to Directive 2004/8/EC replaced by Annex II to Directive 2012/27/EU)	PES in absolute value (Annex III to Directive 2004/8/EC replaced by Annex II to Directive 2012/27/EU)	PES (Annex III to Directive 2004/8/EC replaced by Annex II to Directive 2012/27/EU)
	TWh	Legal persons	Legal persons	%
2007	4.4	67.9	10.5	13.4
2008	3.7	62.4	9.2	12.8
2009	3.5	49.6	8.2	14.2
2010	3.3	47.5	8.0	14.5
2011	3.4	43.3	8.3	16.0
2012	3.0	36.7	7.2	16.4
2013	4.4	56.9	10.5	15.5
2014	3.3	39.7	8.7	18.0
2015	2.9	34.4	7.7	18.3
2016	2.9	35.1	8.3	19.1
2017	3.6	44.2	9.7	17.9

Source: ANRE

PES - primary energy savings compared to separate production of energy (Primary Energy Savings)

High-efficiency cogeneration from renewable energy sources

In 2018, 15 decisions were issued on the qualification of amounts of electricity produced from high-efficiency cogeneration from renewable energy sources, which are entitled to additional green certificates in accordance with Article 6(4) of Law No 220/2008 establishing the system for the promotion of energy production from renewable sources, as republished, as subsequently amended and supplemented.

B. The final energy consumer. (Article 7 of Directive 2012/27/EU on energy efficiency)

- **Energy efficiency in the industrial sector**

  - ✓ Energy efficiency in the industry receiving a State aid under Government Decision No 495/2014

The purpose of this decision is to establish a State support scheme with the aim of exempting from the application of Article 8(2) of Law No 220/2008 establishing the system for the promotion of energy production from renewable energy sources, as republished, as subsequently amended and supplemented, a percentage of the amount of electricity supplied to intensive electricity industrial consumers in accordance with the relevant European regulations, more specifically the "Environmental and Energy Aid Guidelines 2014-2020", which are prepared by the European Commission.

The provisions of this Decision apply to undertakings in the sectors exposed to the risk of becoming less competitive because of their financing of renewable energy support – a risk resulting from the beneficiary's electro-intensive character and exposure to international trade.

The aid will be granted if the undertaking is listed among the sectors in Annex 1.

The state aid is granted on the condition that the beneficiaries of the aid pay at least 15 % of the number of green certificates pertaining to the mandatory quota, without the reduction granted under this exemption scheme.

Depending on the electro-intensive character of undertakings, the beneficiaries will pay the following rates in the number of green certificates pertaining to the mandatory quota:

a) 15 % for an electro-intensive character above 20 %;

b) 40 % for an electro-intensive character between 10 % and 20 %;

c) 60 % for an electro-intensive character between 5 % and 10 %.

For electro-intensive undertakings set up for less than a year and listed among the sectors in Annex 1 to the Guidelines, the data estimated for the first year of business is used. After the first year of business, the Ministry of the Economy checks compliance by the undertaking with the eligibility criteria set under this scheme and then regulates the financial aid granted, where applicable. For the second year of business, the data for the first year of business is used. For the third year of business, the arithmetic mean of the data for the first two years of business is used. Starting with the fourth year of business, the arithmetic mean of the three previous years is used.

The validity period of the state support scheme is ten years.

Following the implementation of this state support scheme in the period 2015-2016, as a result of implementation by beneficiaries of the energy efficiency measures, the following savings were achieved:

- ✓ 2015 - 56 130.6 toe
- ✓ 2016 - 104 745 toe
- ✓ 2017 - 26 962.6 toe

Considering that the Ministry of the Economy checks on an annual basis compliance with the requirements of the Community and national regulations in force and that it monitors the State aid scheme so as to ensure that the granted exemptions are consistent with the rates provided for in Government Decision No 495/2014, as subsequently amended and supplemented, and that the beneficiary of the State aid continues to meet the eligibility criteria established under the scheme based on the documentation submitted by the beneficiary by 31 May of each year, for 2018 energy savings of 17 333.9 toe/year are estimated.

- ✓ **Energy audit and management**

In 2018, DEE of ANRE received and centralised the activity reports of energy auditors as legal persons (including authorised natural persons - PFA). The report of the 47 energy auditors revealed that energy audits were performed at 330 economic operators and that approximately 1 500 energy efficiency improvement measures were recommended, which would lead to estimated post-implementation energy savings of 251 062 toe/year, with an investment figure of approximately RON 12 393 414.

The frequently proposed energy efficiency measures were included in the following categories:

- introducing variable torque actuation;
- reducing losses in the compressed air networks;
- offsetting the power factor;
- optimising burning in ovens;
- optimising operation in installations and technological flows;
- improving the efficiency of lighting in production facilities;
- rehabilitating heat networks;
- using variable torque engines with frequency converters.

Table 16 presents the situation of energy audits developed for the period **2010-2018**

Table 16

Year	Auditors	Economic operators	Number of energy efficiency measures	Estimated energy savings (toe)	Estimated costs (thousand RON)
2010	**14**	**72**	**275**	**176 200**	**1 628 212**
2011	**6**	**41**	**103**	**112 171**	**128 813**
2012	**23**	**198**	**564**	**406 652**	**1 791 466**
2013	**33**	**226**	**701**	**196 705**	**663 684**
2014	**37**	**349**	**432**	**26 790**	**1 160 678**
2015	**73**	**431**	**1 118**	**247 611**	**750 761**
2016	**70**	**330**	**1 286**	**144 818**	**2 185 336**
2017	**72**	**232**	**1 341**	**145 086**	**1 139 723**
2018	**60**	**330**	**1500**	**332 070**	**12 661 108**

Compared to 2017, the number of economic operators which performed energy audits recorded a slight increase, but, at the same time, the number of legal persons authorised to perform energy audits decreased to 60.

According to the energy auditors' estimates, the implementation of the energy efficiency measures recommended in the framework of complex energy audits could bring about cumulated energy savings of over 200 000 toe.

The energy savings estimated to be achieved from the implementation of the energy efficiency measures recommended in the heat audit reports are slightly higher than those which would be achieved from the implementation of the measures recommended during the electricity audits. However, the number of electricity audits is much lower than the number of heat audits. Therefore, there is a higher energy saving potential in heat production units.

Activity segments where energy efficiency measures have been identified, which are likely to bring about substantial energy savings over 10 000 toe, are: the energy industry, the cement industry and the manufacturing industry. It is noteworthy that this data accounts for estimates and represents information pertaining to energy audits conducted by 330 economic operators.

13 audits were performed in 2018 in public administration. By implementing the proposed energy efficiency measures in this activity segment, energy auditors estimate that over 20 000 toe could be achieved, which would entail investments of approximately RON 100 000.

The main objective of the energy management applied to an economic operator is to ensure judicious and efficient energy consumption with a view to maximising profit by minimising energy costs, thus enhancing the competitiveness of the company on the market.

Energy management services are extremely important in a company in the monitoring of energy consumption and the reduction of related costs by implementing an energy efficiency improvement plan. It contains energy efficiency measures which, if implemented, lead to measurable energy savings and have visible effects in the sense of a decrease in energy costs.

This is possible either by employing an ANRE certified energy manager in that company, or by engaging in an energy management contract with an authorised natural person (PFA) certified by ANRE or an energy services company having at least one ANRE certified energy manager.

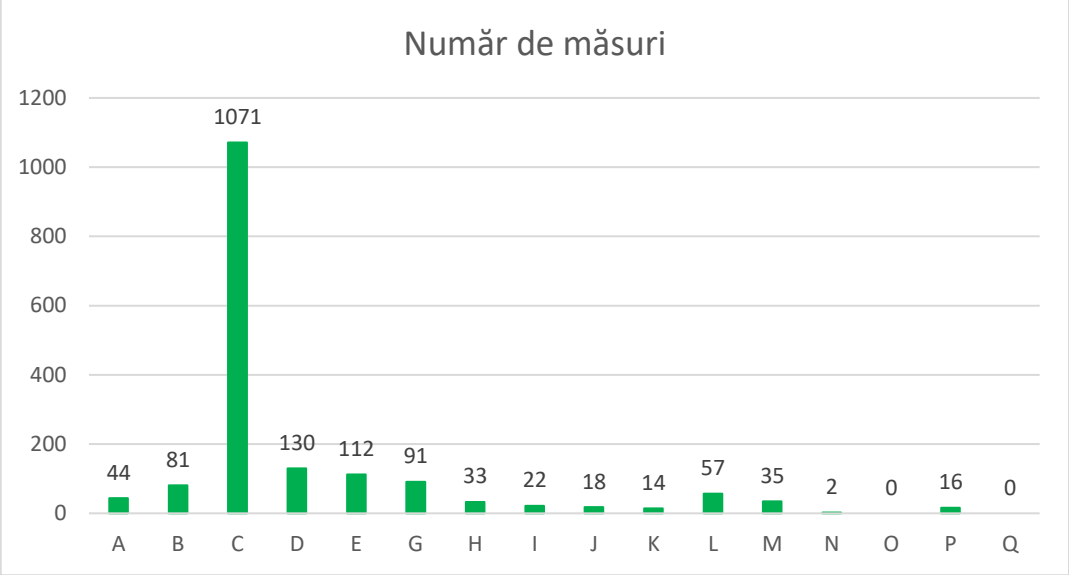
The assessment of the energy efficiency improvement programmes for 2018 reveals energy savings of 84 325 toe, according to Table 17.

Table 17

Index CAEN	Classification as per the CAEN code	Number of measures	Energy saving [toe]
A	Agriculture, forestry and fishing	44	580.72
B	Mining and Quarrying	81	4 905.78
C	Manufacturing industry	1 071	50 542
D	Production and supply of electricity and heat, gas, hot water and air conditioning	130	18 985
E	Water supply, sanitation, waste management and decontamination activities	112	2 936
G	Wholesale and retail trade; motor vehicle and motorcycle repairs	91	2 655
H	Haulage by truck	33	2 022
I	Hotels and Restaurants	22	131.89
J	Information and communication	18	399.35
K	Financial intermediation and insurance activities	14	269.2
L	Real estate transactions	57	160
M	Professional, scientific and technical activities	35	484
N	Administrative and support service activities	2	9.4
O	Public administration and defence; statutory social security system	0	0
P	Education	16	245
	TOTAL	1 791	**84 325.34**

1 071 energy efficiency measures were reported in the activity field “C”, which accounts for 59.79 % in the total measures according to Figure 10.

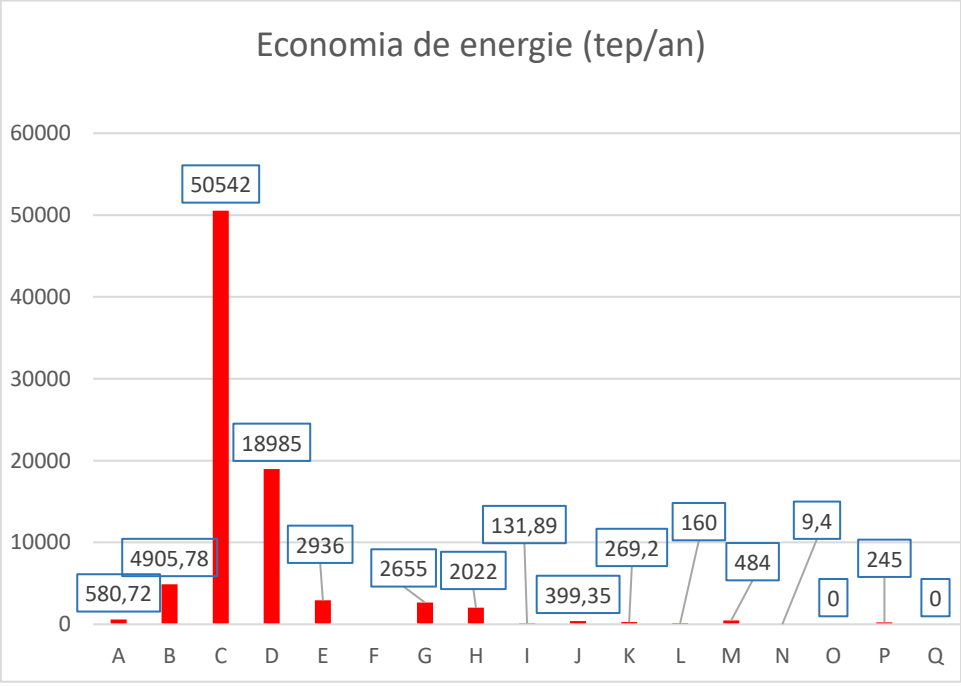
Figure 10



RO	EN
Număr de măsuri	Number of measures

The implementation of these measures leads to the energy savings presented in Figure 11

Figure 11



RO	EN
Economia de energie (tep/an)	Energy saving [toe/year]

Of the 44 legal persons approved to provide energy management services, 13 companies did not conclude energy management contracts and, of the 19 PFAs, 4 persons did not conclude energy management contracts.

According to the reports on energy management contracts, which were submitted by the approved/authorised energy service companies and by the PFA energy managers, energy savings of 76 376.41 toe/year would be achieved through the implementation of the energy efficiency measures proposed. If this value is related to the annual energy consumption of the 313 economic operators (2 175 979.62 toe), the result is an estimated 3.5 % energy saving potential at the economic operators which outsourced the energy management service.

The energy service companies and PFAs also reported that, following the implementation of the energy efficiency measures under the energy efficiency improvement programmes, energy savings of 48 126.80 toe were achieved. Please note that these energy savings are reported for the 313 economic operators which outsourced the energy management service and are related to the energy efficiency measures provided as examples in the reports received from the energy service companies, including the PFAs.

- Energy efficiency in the residential sector

✓ **Implementation of the National Programme for Improvement of Energy Performance in Residential Blocks**

In accordance with Government Emergency Order No 18/2009, as subsequently amended and supplemented, and with Joint Order No 163/2009 of the Ministry of Regional Development and Public Administration (*Ministerul Dezvoltării Regionale și Administrației Publice - MDRL*), of Order No 540/2009 of the Ministry of Public Finance (*Ministerul Finantelor publice - MFP*) and of Order No 23/2009 of the Ministry of Internal Affairs (Ministerul Afacerilor Interne - MAI) approving the Detailed rules implementing Government Emergency Order No 18/2009, as subsequently amended and supplemented, the purpose of the National Programme for Improvement of Energy Performance in Residential Blocks is:

- to increase energy performance in the residential blocks built on the basis of projects prepared until December 2005 by reducing energy consumption in heating, so that the annual specific energy consumption calculated for the heating of households falls below 100 kWh/m^2 of useful area;
- to ensure and maintain heat indoors;
- to reduce greenhouse gas emissions and to introduce, where applicable, alternative energy production sources;
- to improve the urban aspect of localities.

In order to achieve the purpose of the Programme, the following are funded:

a) thermal rehabilitation works to the envelope: thermal insulation of outer walls of the block, replacement of the existing outer joinery, including that pertaining to the entrance to the residential block, thermal insulation of the terrace, thermal insulation of the floor above the last level where the lattice mast exists, enclosure of balconies and/or loggias with thermally insulating joinery, including thermal insulation of bulwarks, the thermal insulation of the floor over the underground.

b) works of thermal rehabilitation to the heating system: repairing/recovery of the distribution installation between the connection point and the floor over the underground/heat channel, including its thermal insulation, mounting of thermostatic valves to radiators, repairing/replacement of boiler and/or burner from the central heating plant of the block/block section;

c) the rehabilitation and upgrading of the heat transfer fluid distribution plant - heating and hot water for consumption, the common part of the residential block, including mounting of thermostatic valves in radiators and the insulation of underground pipes/heat duct in order to reduce heat and mass losses and to increase energy efficiency.

d) thermal rehabilitation works to the system supplying hot water for consumption;

e) where applicable, the installation of alternative systems for production of energy from renewable sources - heat solar panels, electricity solar panels, heat pumps and/or biomass central heating plants, including their purchase.

Depending on the results of the technical expertise and of the energy audit conducted on the block, these works may be supplemented with: repairing of construction elements in the facade, where there is the danger of falling off and/or the functionality of the residential block is affected, repairing of the terrace/lattice mast type roof, including the repairing of the rainfall collector drains from terrace/lattice mast envelope, dismantling of installations and equipment mounted visibly on the facades/terrace of the residential block, and their remounting after the intervention works, recovery of interior finishes in the areas of intervention, repairing/recovery of ventilation channels in flats in order to maintain/achieve natural ventilation of occupied spaces, development performance of works for reconnecting the residential block to the centralised heat production and supply system, the individual energy consumption measurement equipment for heating and for hot water for consumption, the repairing of protection sidewalks in order to remove infiltrations at the infrastructure of the residential block, repairing/replacement of the cold water distribution installation and/or of sewage and/or rainfall collectors in the underground of the residential block up to the connecting manhole and replacement of the fluorescent and incandescent filament lighting fixtures in common areas with high energy efficient lighting fixtures and increased lifetime.

Compared to the energy saving of 572 859 MWh (49 266 toe) achieved from the implementation of the energy efficiency measures in the period 2011-2017 in the residential buildings included in the National Programme, savings of 4 366 243.10 kwh (375 toe) were achieved in 2018 according to Table 18.

Table 18

Energy saving in 2018	
[MWh]	[toe]
577 225	**49 641**

✓ **Implementation of the Programme for the thermal rehabilitation of residential blocks funded from the EU Structural and Cohesion Funds - the 2014-2020 ROP**

The 2014-2020 Regional Operational Programme (ROP) finances investments for the increase in energy efficiency under the Priority Axis 3: Supporting the shift towards a low-carbon economy, Investment Priority 3.1. - energy efficiency in public buildings, residential buildings and public lighting in the following fields: residential buildings, public buildings and public lighting.

For Operation A - Residential buildings, the following results were recorded under the completed projects:

- thermal rehabilitation was provided to 279 residential blocks, more specifically 19 596 apartments;
- the annual specific energy consumption for heating was reduced by 21 691 kWh/m^2 per year;
- the annual specific energy consumption was reduced by 35 389 kWh/m^2 per year.

Primary energy savings of **149 012 596 kWh/year (12 815 toe/year)** were achieved

No data may be reported in connection with the energy savings achieved for Operation B - Public buildings and Operation C - Public lighting as no completed projects were recorded at the end of 2018.

✓ **Energy efficiency in government buildings**

In order to apply Article 5(1) of Directive 2012/27/EU on energy efficiency, the inventory of the buildings with areas above 250 square meters was updated, also including relevant energy data about them, as referred to in Order No 3466/2013 of MDRAP, published in Official Gazette of Romania, Part I, No 778/2013 and Order No 263/2015 of MDRAP, published in Official Gazette of Romania, Part I, No 490/2015 and posted on the website of MDRAP under the section of Constructions/Energy performance of buildings (*Construcții/Performanța energetică a clădirilor*).

- In order to achieve the 3 % annual renovation rate for this category of buildings, as calculated with reference to the total useful area of the heated and/or cooled buildings, which are held and occupied by the central public administration, the following actions were carried out:
- the technical expertise on the resistance structure of buildings;
- the preparation of the energy audit, including the preparation and the posting of the energy performance certificate for inventoried buildings;
- the preparation of the energy efficiency plan, with specific objectives and actions on major renovation/thermal rehabilitation of inventoried buildings and the estimated energy saving;
- the replacement of the existing exterior joinery with energy efficient joinery;
- the partial thermal insulation of certain envelope elements of the building;
- the replacement of the incandescent/fluorescent filament lighting fixtures with economic and highly efficient lighting fixtures;
- the maintenance/repair works to the interior heating installations, including replacing the central heating plant with high performance units;
- complex energy performance increase works (major rehabilitation).

Compared to the energy saving achieved from the implementation of the energy efficiency measures in the period 2015-2017, more specifically 36 103 MWh, in 2018 an additional saving of 4 818 753.88 kWh (415 toe) was achieved following the execution of the abovementioned energy efficiency works according to Table 19.

Table 19

Energy saving in 2018	
[MWh]	[toe]
40 922	**3 520**

- **Energy efficiency in the transport sector**

✓ **Extension of the underground transport in Bucharest**

Following the retrofitting of the electrical underground substations, of the low and medium voltage installations and of the 750 Vdc traction installations, Metrorex achieved energy savings of 1 419 toe. The retrofitting of the rolling stock for 15 trains led to savings of 602 toe.

Moreover, investments were made in LED lighting, the retrofitting of escalators and of the installations pertaining to the ventilation system of six stations on the main route 1 and 16 modern underground trains were purchased.

Table 20 lists these measures and the savings achieved following their application.

Table 20

No	Implemented measure	Energy savings in toe/year				
	Year	2014	2015	2016	2017	2018
1.	LED lighting	Staged commissioning	75	125	200	300
2.	Retrofitting of escalators	Commissioning	500	500	500	500
3.	Retrofitting of electrical underground substations - the 10 kV medium voltage installations - 750 Vdc traction installations -	1 419	1 419	1 419	1 419	1 419
4.	Retrofitting of the rolling stock - Improving the reliability of the rolling stock - 15 IVA trains - commissioned in 2013	602	602	602	602	602
5.	Purchase of 16 trains	Commissioning	731	731	731	731
7.	Retrofitting of installations pertaining to the general ventilation system of the stops and inter-stops of Mag. 1 - 6 stops			Commissioning	200	200
8.	Purchase of 8 trains			Commissioning	163.4	163.4
TOTAL						**3 915**

- ✓ **Retrofitting of rail transport**

At the National Railway Company (Compania Națională de Căi Ferate C.F.R. SA) measures were implemented to improve energy efficiency as per the Energy Efficiency Improvement

Plan of CNCF CFR SA for the period 2013-2026, leading to total energy savings of 973 toe/year. Further works were performed for the introduction of economic exterior lighting in railway stations and the mounting of LED signalling units and energy efficiency improvement works were performed on the railway exploitation buildings.

Table 21 lists these measures and the savings achieved following their application.

Table 21

No	Implemented measure	Energy savings in toe/year			
		2015	**2016**	**2017**	**2018**
1	LED signalling units	0	11	10	10
2	Installing exterior economic lighting in railway stations	0	6	3	3
3	Energy efficiency improvement works on railway exploitation buildings	0	1 853	940	960
4	Implementing a system for electricity tele-management and offsetting of the power factor at the electrical traction substations	0	0	0	0
Total savings [toe]		**0**	**1 870**	**953**	**973**

Energy efficiency measures were implemented at **CFR Călători SA**, leading to energy savings of 32 toe

- SRTFC Cluj - retrofitting works on the interior and exterior lighting installations, replacement of the central heating plants, thermal insulation of steam pipes;
- SRTFC Iași - repair works on the heat installation in the Suceava service shop;
- SRTFC Galați - works to replace the wooden joinery with thermally insulated panes at Buzau and providing the envelope for the staircase boot.

At **SNTF CFR Marfă SA**, the followign types of measures were applied:

A. technical and organisational measures with short-term implementation and duration of up to one year, involving no cost or a minimum cost, not involving major investments.
The energy savings achieved from the implementation of measures is 4.83 toe/year and the financial saving achieved is RON 21.72 thousand/year at the following locations:

- the Area Centre for Freight in Brasov - Targu Mures Service Shop implemented the measure involving the reduction of electricity consumption by mounting lighting fixtures with sensors for access halls and the staircase, with a cost of RON 0.90 thousand, energy savings of 0.17 toe/year being achieved;
- the Muntenia-Dobrogea Subsidy - Palas Service Shop implemented the measure of reduction in fuel consumption by correcting the burning parameters of the central heating plants and mounting of timer thermostats, energy savings of 4.20 toe/year being achieved;

a) the correction of the parameters of the BIASI SG 7 central heating plant and the mounting of a timer thermostat, with a cost of RON 0.29 thousand, energy savings of 0.948 toe/year being achieved;
b) the correction of the parameters of the Ariston Egis Plus 24 FF central heating plant - the building of the head of shift at the Palas Service Shop, with a cost of RON 3.52 thousand/year, energy savings of 0.768 toe/year being achieved;
c) the correction of the parameters of the SIME central heating plant - the building of the mechanics' bedrooms and mounting of timer thermostats with an implemented measure cost = RON 0.300 thousand, energy savings of 2.49 toe/year being achieved;

- the Area Centre of Freight in Brasov - Targu-Mures Service Shop - reduction in consumption of fuel by correcting the burning parameters of central heating plants, energy savings of 0.46 toe being achieved;

a) the correction of the parameters for the Boiler ARISTON SGN 1000 at the administrative building A, energy savings of 1 MWh/year = 0.086 toe/year being achieved;
b) the correction of the parameters for the convector heating system at the RRD building, energy savings of 0.800 MWh/year = 0.068 toe/year being achieved;
c) the correction of the parameters for the Ferroli Pegasus boiler at the old administrative building, energy savings of 3 MWh/year = 0.258 toe/year being achieved;
d) the correction of the parameters for the convector heating system at the vehicle parking facility, energy savings of 0.600 MWh/year = 0.051 toe/year being achieved;

B. Medium-term measures for one to three years produce energy savings of 12.9 toe/year at the following locations:

- The Muntenia-Dobrogea Subsidy - the reduction in fuel consumption at the Palas Service Shop by replacing a LPG-fuelled central heating plant with a power plant. Measure implementation cost = RON 3.77 thousand, with fuel savings of 5.86 toe/year
- The Wagon Maintenance and Repair Centre - the reduction in electricity consumption recorded at the fixed sites in the maintenance workflow for wagon repairs by equipping the wagon maintenance and repair sections with eight 380 V welding invertors replacing the eight old welding machines. Measure implementation cost = RON 19.60 thousand, annual energy savings of 65.28 MWh/year = 5.61 toe/year
- The Muntenia-Dobrogea Subsidiary - Palas Service Shop - the reduction in electricity consumption by replacing 20 lamps of 250 W with LED 60 W at the perimeter exterior lighting with a measure implementation cost of RON 0.50 thousand and energy savings of 1.43 toe/year from the implementation of the measure;

✓ **Retrofitting of air transport**

The analysis of the EEIPs revealed the implementation of the following types of energy efficiency measures, with energy savings of 665 toe:

- Tarom SA, by replacing the old joinery with a PVC joinery, achieved energy savings of 2.6 toe;
- the Romanian administration of air traffic services, Romatsa, replaced the control valves with thermostat valves on the heating units, leading to energy savings of 1.7 toe;
- the Carpatair airline continued the implementation of measures under the Retrofitting Programme, with energy savings of 102.9 toe;
- the Blue Air airline installed Winglet devices on the airplane wings, which led to energy savings of 439 toe, and the continuation of the internal maintenance programmes for the

aircraft fleet led to energy savings of 35 toe. Consequently, the total savings achieved in 2018 with the implementation of three measures is 474 toe;

- CN AEROPORTURI in Bucharest restored the thermal insulation of the ventilation piping, performed thermal/hydro-insulation of buildings on the airport platform, and retrofitted central heating plants, which led to energy savings of 84 toe.

6. STATEMENT OF ENERGY AUDITS AND ACCESS TO THE SYSTEMS OF AUTHORISATION OF ENERGY AUDITORS AND CERTIFICATION OF ENERGY MANAGERS

The work involving the authorisation of energy auditors/certification of energy managers sustains the promotion and development of a system which ensures the availability of audits capable of harnessing the energy saving potential of the final energy consumer.

The relevant number of energy auditors authorised annually indicates the opening of the energy services market, providing final energy consumers with the possibility to conduct the energy audit in accordance with the legal provisions. Through the information on the type of authorisations and contact details of the persons authorised by ANRE, which are available on the ANRE website, free and unconditional access is ensured for the interested parties.

The minimum transparent and non-discriminatory criteria for the energy audits required by the Rules of authorisation of energy auditors constitutes a premise for the performance of quality works which lead to the identification of energy efficiency improvement measures at the final consumer and to the achievement of the energy saving targets claimed by Romania in the national energy efficiency action plans through their implementation.

At the end of 2018, the statement of energy efficiency certificates/authorisations was the following:

- 413 energy manager certificates
- 176 authorisations for energy auditors as natural persons
- 60 authorisations for energy auditors as legal persons, of which 12 energy auditors as PFA
- 68 approved energy service companies (of which 19 PFAs).

The structure of authorisations and certificates granted in 2018 is set out in **Table 22.**

Table 22

Type of certificate/authorisation granted in 2018	Total	New certificates/authorisations	Extensions of certificates/authorisations
Energy managers	101	58	43
Energy auditors as natural persons	28	16	12
Energy auditors as legal persons	11	8	3
Accredited energy service companies	54	54	-

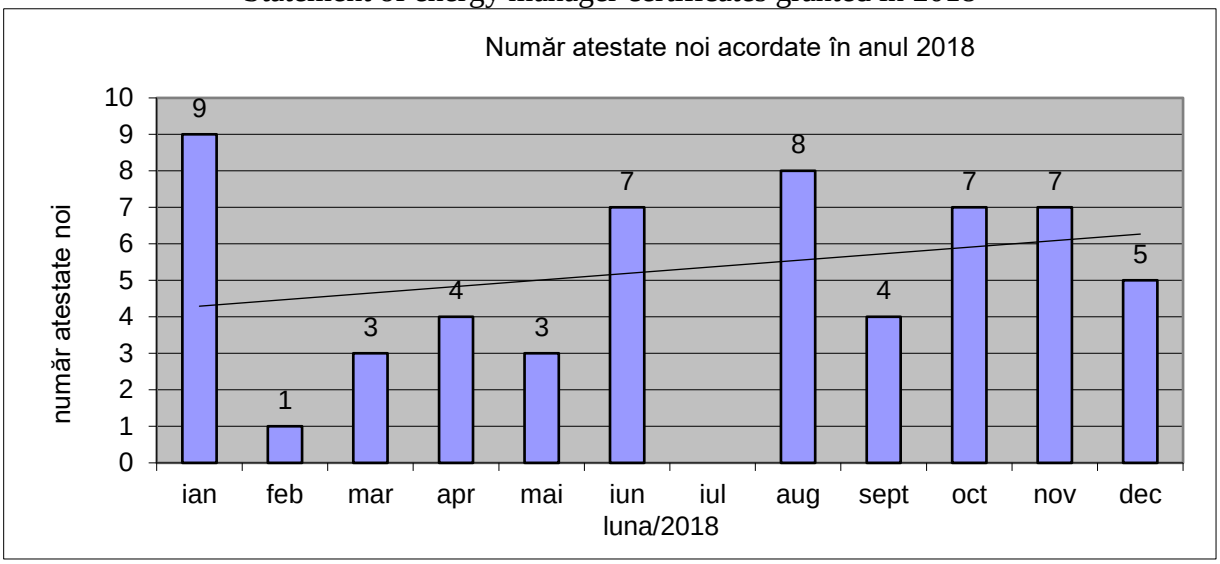
Source: ANRE

6.1 Energy manager certificates

The certification/authorisation/approval work by month, for 2018, is the following:

Figure 12

Statement of energy manager certificates granted in 2018

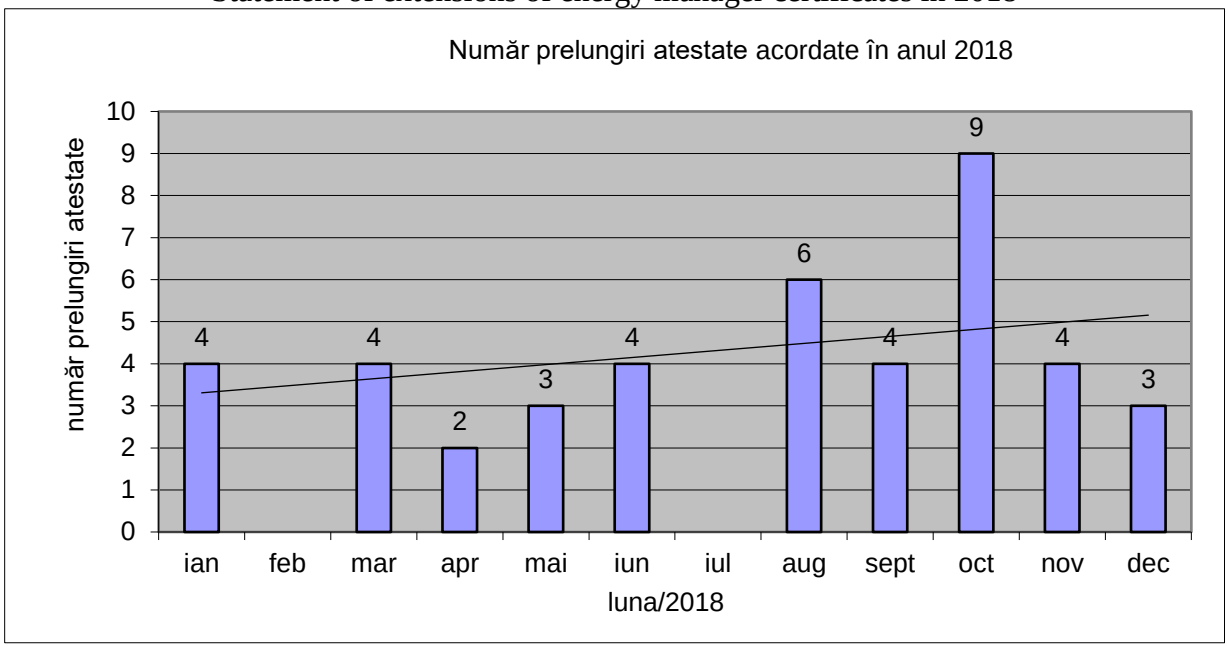


Source: ANRE

RO	EN
Număr atestate noi acordate în anul 2018	Number of new certificates granted in 2018
număr atestate noi	number of new certificates
ian	January
feb	February
mar	March
apr	April
mai	May
iun	June
iul	July
aug	August
sept	September
oct	October
nov	November
dec	December
luna/2018	month/2018

Figure 13

Statement of extensions of energy manager certificates in 2018

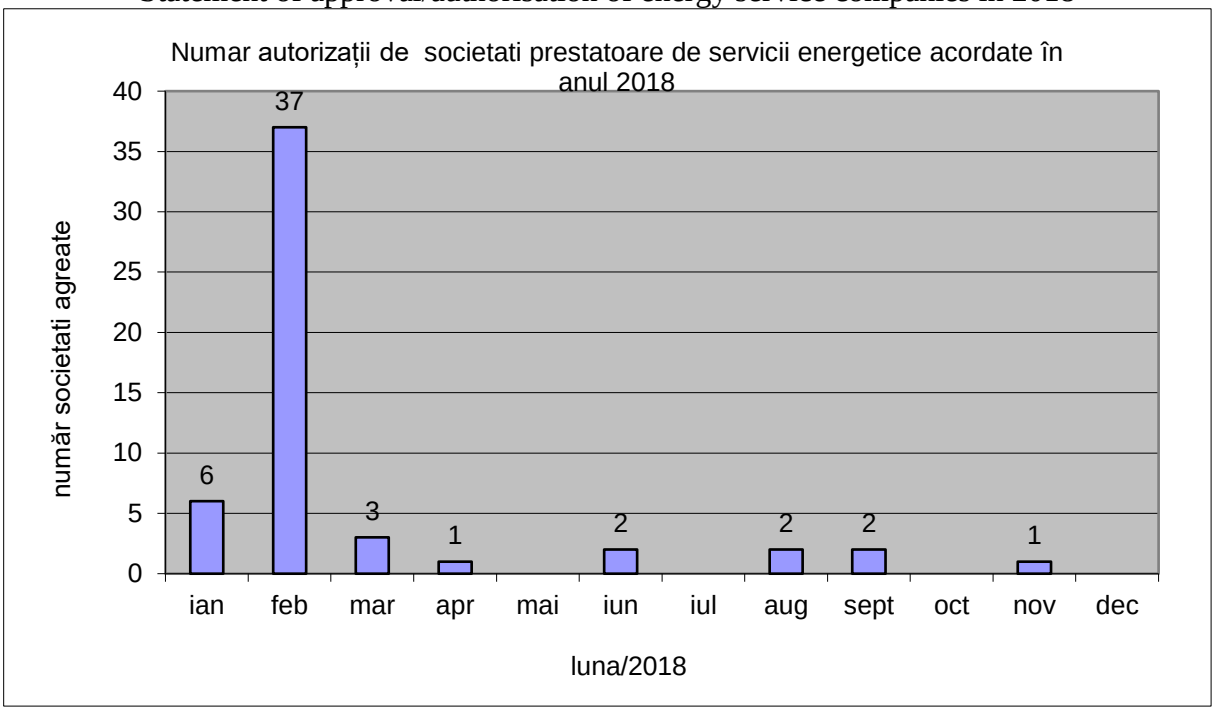


Source: ANRE

RO	EN
Număr prelungiri atestate acordate în anul 2018	Number of certificate extensions granted in 2018
număr prelungiri atestate	number of certified extensions
ian	January
feb	February
mar	March
apr	April
mai	May
iun	June
iul	July
aug	August
sept	September
oct	October
nov	November
dec	December
luna/2018	month/2018

Figure 14

Statement of approval/authorisation of energy service companies in 2018



Source: ANRE

RO	EN
Număr autorizații de societăți prestatoare de servicii energetice acordate în anul 2018	Number of authorisations granted to energy service companies providing in 2018
număr societăți agreate	number of approved companies
ian	January
feb	February
mar	March
apr	April
mai	May
iun	June
iul	July
aug	August
sept	September
oct	October
nov	November
dec	December
luna/2018	month/2018

The energy service companies approved until the date of entry into force of Decision No 1111/2017 of ANRE amending and supplementing Decision No 2794/2014 of ANRE were given a deadline to apply for the authorisation as an energy service company by the beginning of February 2018. This is why the abovementioned schedule includes, for February, a large number of such applications, far beyond the average for the other months.

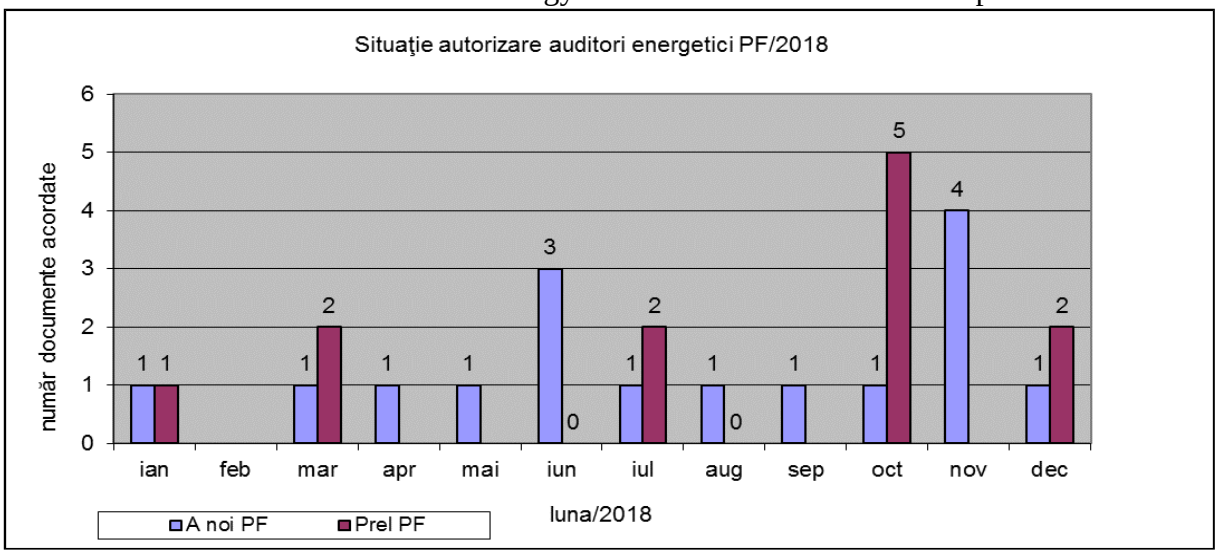
6.2. Authorisation of energy auditors

The work of energy auditors who carry out their activity in the industrial, transport or services field is regulated by the Rules for the authorisation of the industry energy auditors approved by Decision No 2794/2014 of ANRE, as amended and supplemented by Decision No 1111/2017 of ANRE (Rules).

In accordance with the Regulation, energy auditors acting as legal persons must submit the Annual Report on the energy audit work to the Authorising Commission from ANRE, by 30 January of the year following the analysed year.

Figure 15

Statement of authorisation of energy auditors established as natural persons for 2018

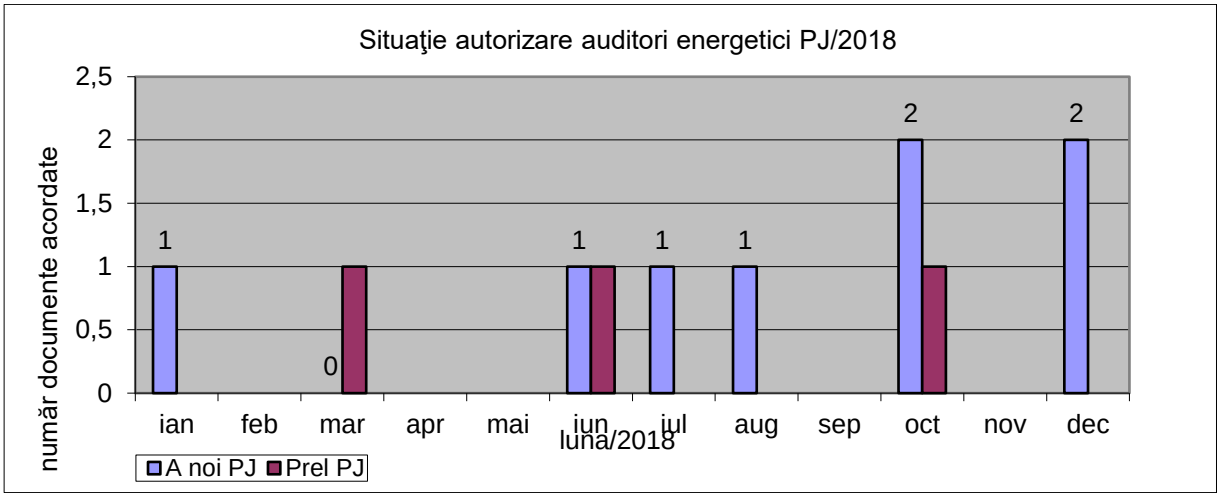


Source: ANRE

RO	EN
Situație autorizare auditori energetici PF/2018	Statement regarding the authorisation of energy auditors as natural persons/2018
număr documente acordate	number of documents granted
ian	January
feb	February
mar	March
apr	April
mai	May
iun	June
iul	July
aug	August
sept	September
oct	October
nov	November
dec	December
luna/2018	month/2018
A noi PF	New authorisations for natural persons
Prel PF	Extensions for natural persons

Figure 16

Statement of authorisation of energy auditors established as legal persons for 2018



Source: ANRE

RO	EN
Situație autorizare auditori energetici PJ/2018	Statement regarding the authorisation of energy auditors as legal persons/2018
număr documente acordate	number of documents granted
ian	January
feb	February
mar	March
apr	April
mai	May
iun	June
iul	July
aug	August
sept	September
oct	October
nov	November
dec	December
luna/2018	month/2018
A noi PF	New authorisations for natural persons
Preș PF	Extensions for natural persons

In 2018, 47 energy auditors established as legal persons conducted energy audits at 330 economic operators. The reports submitted by them revealed that over 1 500 energy efficiency improvement measures were identified, representing estimated energy savings of 251 062 toe/year, with an investment value of approximately RON 12 393 414 thousand.

The frequently proposed energy efficiency measures were included in the following categories:
- introducing variable torque actuation,
- reducing losses in the compressed air networks,
- offsetting the power factor,
- optimising burning in ovens,
- optimising operation in installations and technological flows,

- improving the efficiency of lighting in production facilities,
- rehabilitating heat networks,
- switching to energy efficient engines actuated with variable torque with frequency convertors

For the period **2010-2018,** the statement of the performance of energy audits is the following:

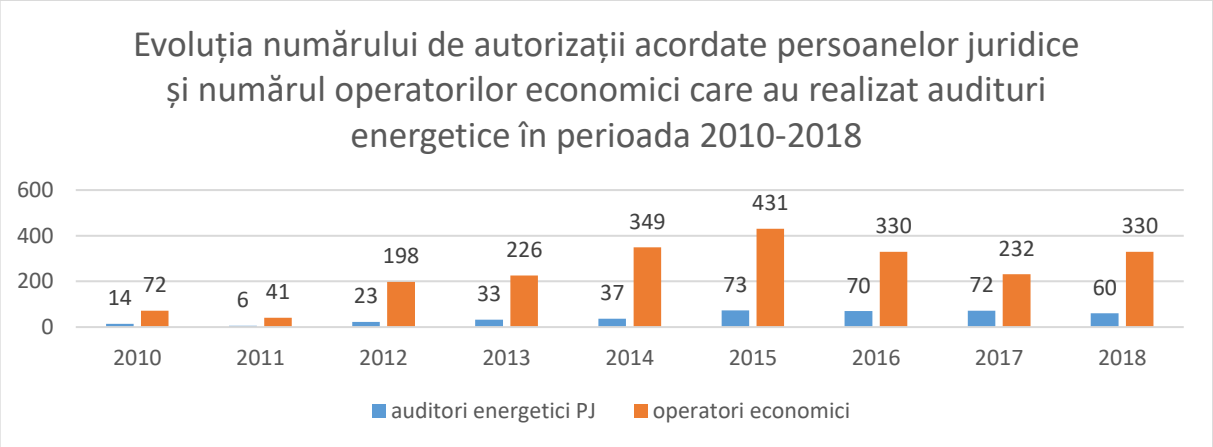
Table 23

Year	Auditors	Economic operators	Number of energy efficiency measures	Estimated energy savings (toe)	Estimated costs (thousand RON)
2010	14	72	275	176 200	1 628 212
2011	6	41	103	112 171	128 813
2012	23	198	564	406 652	1 791 466
2013	33	226	701	196 705	663 684
2014	37	349	432	26 790	1 160 678
2015	73	431	1 118	247 611	750 761
2016	70	330	1 286	144 818	2 185 336
2017	72	232	1 341	145 086	1 139 723
2018	60	330	1 500	332 070	12 661 108

Source: ANRE

Figure 17

The comparative statement on the number of authorisations granted to legal persons and the number of economic operators which performed energy audits in the period 2010-2018



Source: ANRE

RO	EN
Evoluția numărului de autorizații acordate persoanelor juridice și numărul operatorilor economici care au realizat audituri energetice în perioada 2010-2018	Trend in the number of authorisations granted to legal persons and number of economic operators which performed energy audits in the period 2010-2018
auditori energetici PJ	energy auditors as legal persons
operatori economici	economic operators

Compared to 2017, there has been a slight increase in the number of economic operators which achieved energy audits. This market segment performed energy audits in 2014 and complied with the requirements imposed by Law No 121/2014 on energy efficiency for the performance of the energy audit every four years.

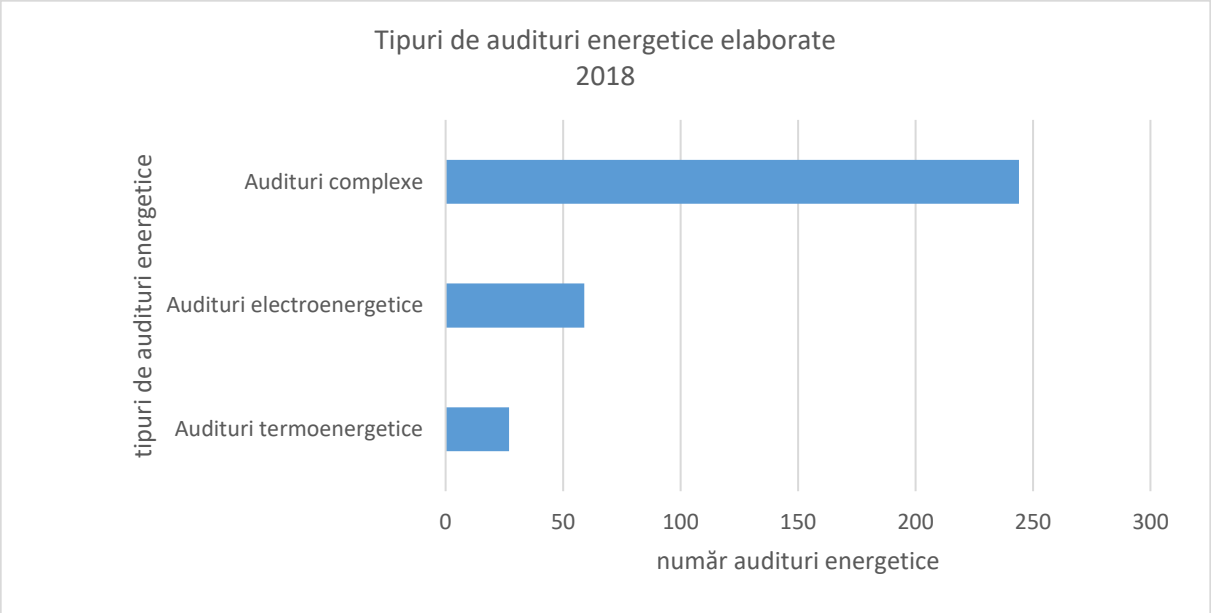
However, at the same time, the number of legal persons authorised to perform energy audits dropped to 60. Due to the introduction of a scale of 50 points required in order to extend the authorisation as a legal person energy auditor, in accordance with Decision No 1111/2017 of ANRE amending and supplementing Decision No 2794/2014 of ANRE, not all the entities authorised in 2017 could maintain the validity of their authorisation.

In 2018, a number of eight new legal persons applied for a new authorisation.

The types of energy audits conducted in 2018 and their distribution by activity segment are presented in the graphs and tables below.

Figure 18

Types of energy audits performed in 2018



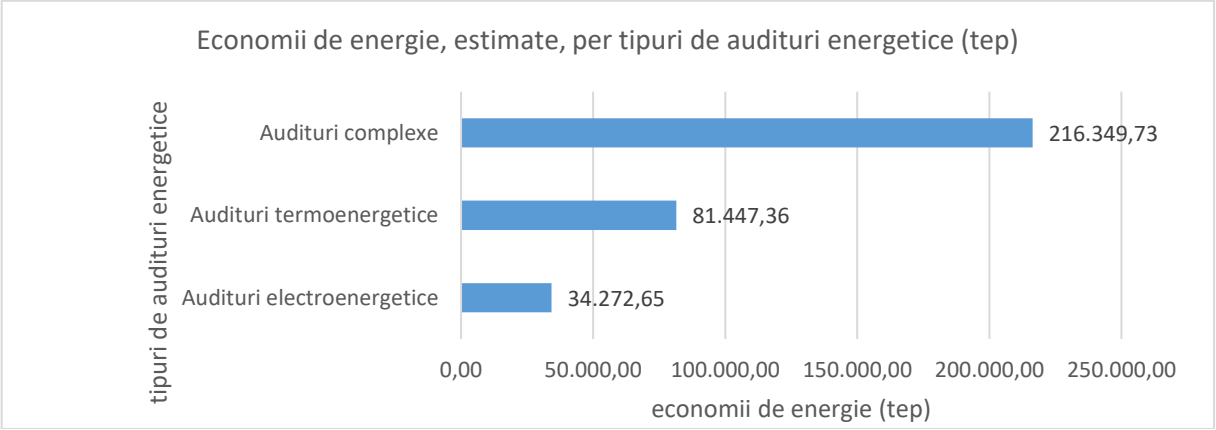
Source: ANRE

RO	EN
Tipuri de audituri energetice elaborate 2018	Types of energy audits performed in 2018
Audituri complexe	Complex audits
Audituri electroenergetice	Electricity audits
Audituri termoenergetice	Heat audits
tipuri de audituri energetice	types of energy audits
număr audituri energetice	number of energy audits

This year, economic operators also opted, with a majority, for the performance of complex energy audits.

Figure 19

Energy savings estimated to be achieved by energy audit types



Source: ANRE

RO	EN
Economii de energie, estimate, per tipuri de audituri energetice (tep)	Estimated energy savings by types of energy audits (toe)
Audituri complexe	Complex audits
Audituri termoenergetice	Heat audits
Audituri electroenergetice	Electricity audits
tipuri de audituri energetice	types of energy audits
economii de energie (tep)	energy savings (toe)

According to the energy auditors' estimates, the implementation of the energy efficiency measures recommended in the framework of complex energy audits could bring about cumulated energy savings of over 200 000 toe.

The energy savings estimated to be achieved from the implementation of the energy efficiency measures recommended in the heat audit reports are slightly higher than those which would be achieved from the implementation of the measures recommended during the electricity audits. However, the number of electricity audits is much lower than the number of heat audits. Therefore, there is a higher energy saving potential in heat production units.

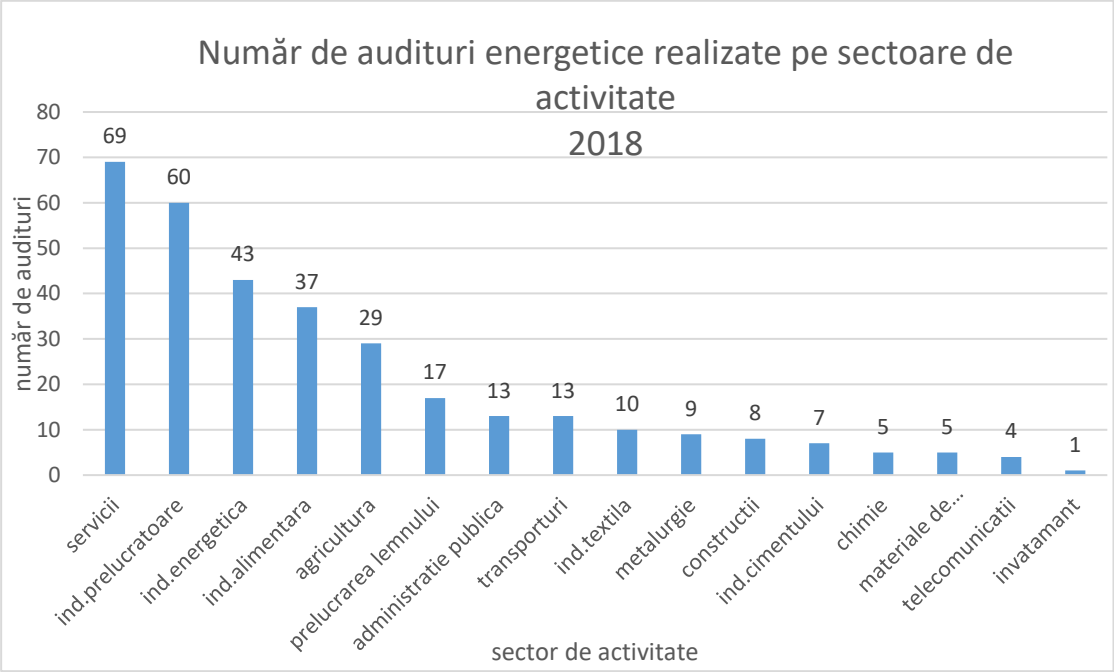
Below is an overview of the types of energy audits performed by authorised natural persons (PFA) or legal persons (LP), with the indication of estimated energy savings:

Table 24

	number of audits			energy savings (toe)		
	PFA	Legal persons	TOTAL	PFA	Legal persons	TOTAL
Heat audits	2	25	27	51.90	81 395	81 447.36
Electricity audits	10	49	59	1 509.12	32 764	34 272.65
Complex audits	17	227	244	917.90	215 432	216 349.73
TOTAL	29	301	330	2 478.92	329 590.82	332 069.74

Source: ANRE

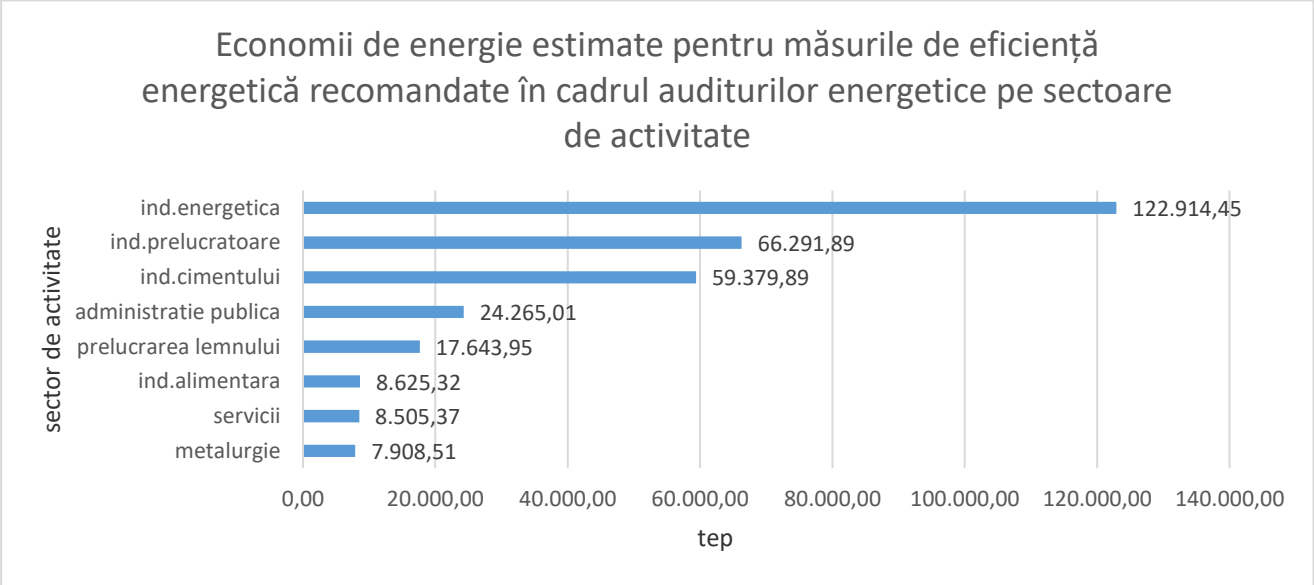
Figure 20
Number of energy audits performed per activity segment



RO	EN
Număr de audituri energetice realizate pe sectoare de activitate	Number of energy audits performed per activity segment
număr de audituri	number of audits
servicii	services
ind. prelucrătoare	the manufacturing industry
ind. energetică	the energy industry
ind. alimentară	the food industry
agricultură	agriculture
prelucrarea lemnului	wood processing
administrație publică	public administration
transporturi	transport
ind. textilă	the textile industry
metalurgie	manufacture of basic metals
construcții	construction
ind. cimentului	the cement industry
chimie	chemistry
materiale de …	construction materials
telecomunicații	telecommunication
învățământ	education
sector de activitate	activity segment

The services sector is noteworthy because, in the past three years, the number of economic operators which complied with Law No 121/2014 on energy efficiency, as subsequently amended and supplemented, has increased in regard to the performance of the energy audit. The energy saving potential in this sector is quite significant if we consider the energy auditors' estimates for the recommended energy efficiency measures.

Figure 21
Energy saving estimated for the energy efficiency measures recommended in the framework of energy audits by activity segment

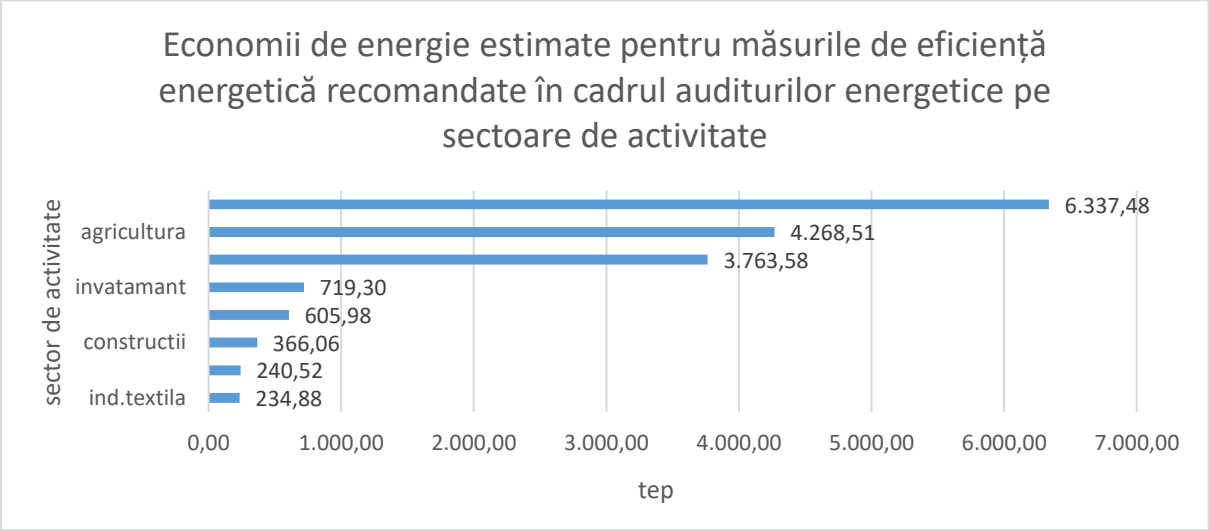


Source: ANRE

RO	EN
Economii de energie estimate pentru măsurile de eficiență energetică recomandate în cadrul auditurilor energetice pe sectoare de activitate	Energy saving estimated for the energy efficiency measures recommended in the framework of energy audits by activity segment
sector de activitate	activity segment
ind. energetică	energy industry
ind. prelucrătoare	manufacturing industry
ind. cimentului	cement industry
administrație publică	public administration
prelucrarea lemnului	wood processing
ind. alimentară	food industry
servicii	services
metalurgie	manufacture of basic metals
tep	toe

Figure 22

Energy saving estimated for the energy efficiency measures recommended in the framework of energy audits by activity segment



Source: ANRE

RO	EN
Economii de energie estimate pentru măsurile de eficiență energetică recomandate în cadrul auditurilor energetice pe sectoare de activitate	Energy saving estimated for the energy efficiency measures recommended in the framework of energy audits by activity segment
sector de activitate	activity segment
agricultură	agriculture
învățământ	education
construcții	construction
ind. textilă	the textile industry
tep	toe

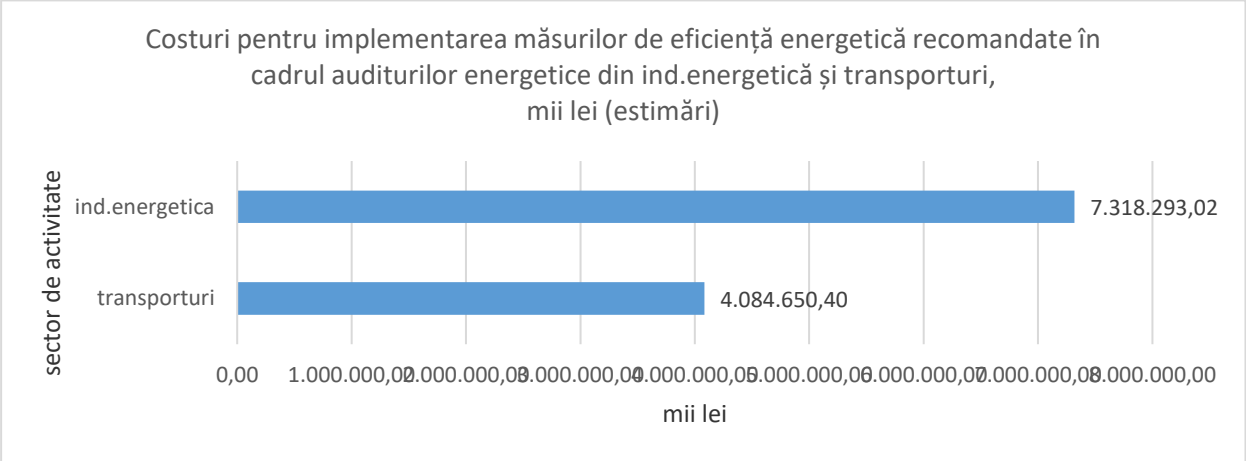
Activity segments where energy efficiency measures have been identified, which are likely to bring about substantial energy savings over 10 000 toe, are: the energy industry, the cement industry and the manufacturing industry. It is noteworthy that this data accounts for estimates and represents information pertaining to energy audits conducted by 330 economic operators.

ANRE's database includes 854 economic operators with annual energy consumption above 1 000 toe and approximately 1 100 economic operators recording annual energy consumption below 1 000 toe. However, part of them are exempted from the performance of the energy audit because they implemented an energy and/or environment management system or are small and medium enterprises.

In accordance with Article 9(1)(a) of Law No 121/2014 on energy efficiency, energy audit is mandatory for all types of energy consumers and underlies the establishment and application of energy efficiency measures. The programme of energy efficiency improvement measures must include the recommendations from the energy audits.

Figure 23

Costs for the energy efficiency measures recommended in the framework of energy audits in the energy and transport industry



Source: ANRE

RO	EN
Costuri pentru implementarea măsurilor de eficiență energetică recomandate în cadrul auditurilor energetice din ind. energetică și transporturi, mii lei (estimări)	Costs for the implementation of the energy efficiency measures recommended in the framework of energy audits in the energy industry and transport, thousand RON (estimates)
sector de activitate	activity segment
ind. energetică	the energy industry
transporturi	transport
mii lei	thousand RON

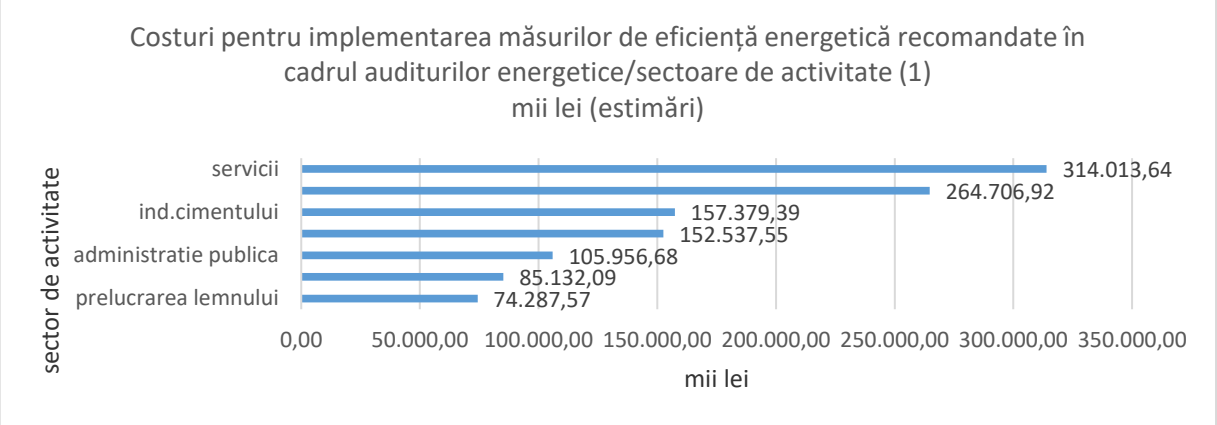
Total costs for the implementation of the energy efficiency measures recommended in the energy and transport industry range between 4 and 7 billion RON as per the chart above (Figure 24).

It is noteworthy that, in the transport sector, the recommended energy efficiency measures included purchases of Euro 6 motor vehicles, which increases significantly the value of investment costs. However, energy savings in this sector were estimated to slightly above 3 500 toe.

The implementation of energy efficiency measures in the energy industry, which would generate estimated energy savings of over 100 000 toe, entails costs of over 7 billion RON.

Figure 24

Costs for the energy efficiency measures recommended in the framework of energy audits (1)

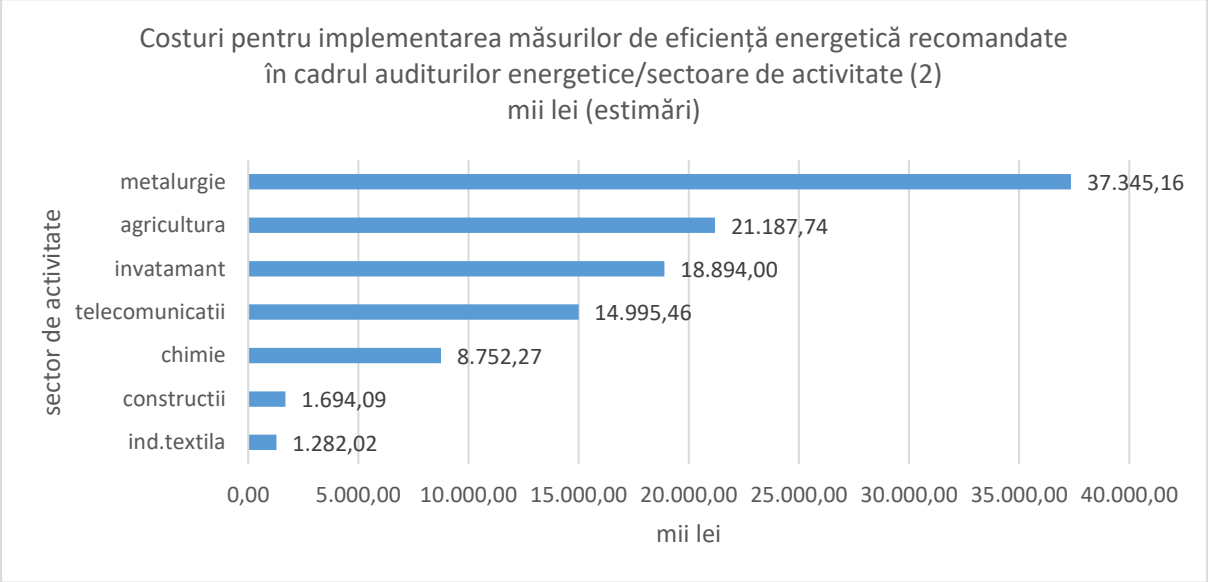


Source: ANRE

RO	EN
Costuri pentru implementarea măsurilor de eficiență energetică recomandate în cadrul auditurilor energetice/sectoare de activitate (1) mii lei (estimări)	Costs for the implementation of the energy efficiency measures recommended in the framework of energy audits/activity segments, (1) thousand RON (estimates)
sector de activitate	activity segment
servicii	services
ind. cimentului	the cement industry
administrație publică	public administration
prelucrarea lemnului	wood processing
mii lei	thousand RON

Figure 25

Costs for the energy efficiency measures recommended in the framework of energy audits (2)



RO	EN
Costuri pentru implementarea măsurilor de eficiență energetică recomandate în cadrul auditurilor energetice/sectoare de activitate (2) mii lei (estimări)	Costs for the implementation of the energy efficiency measures recommended in the framework of energy audits/activity segments, (2) thousand RON (estimates)
sector de activitate	activity segment
metalurgie	manufacture of basic metals
agricultură	agriculture
învățământ	education
telecomunicații	telecommunication
chimie	chemistry
construcții	construction
ind. textilă	the textile industry
mii lei	thousand RON

The number of companies in the services sector, which perform energy audits, has increased in the past three years. Thus, 69 entities performed energy audits which estimated energy savings of 8 500 toe, with investment costs of over RON 300 000 thousand.

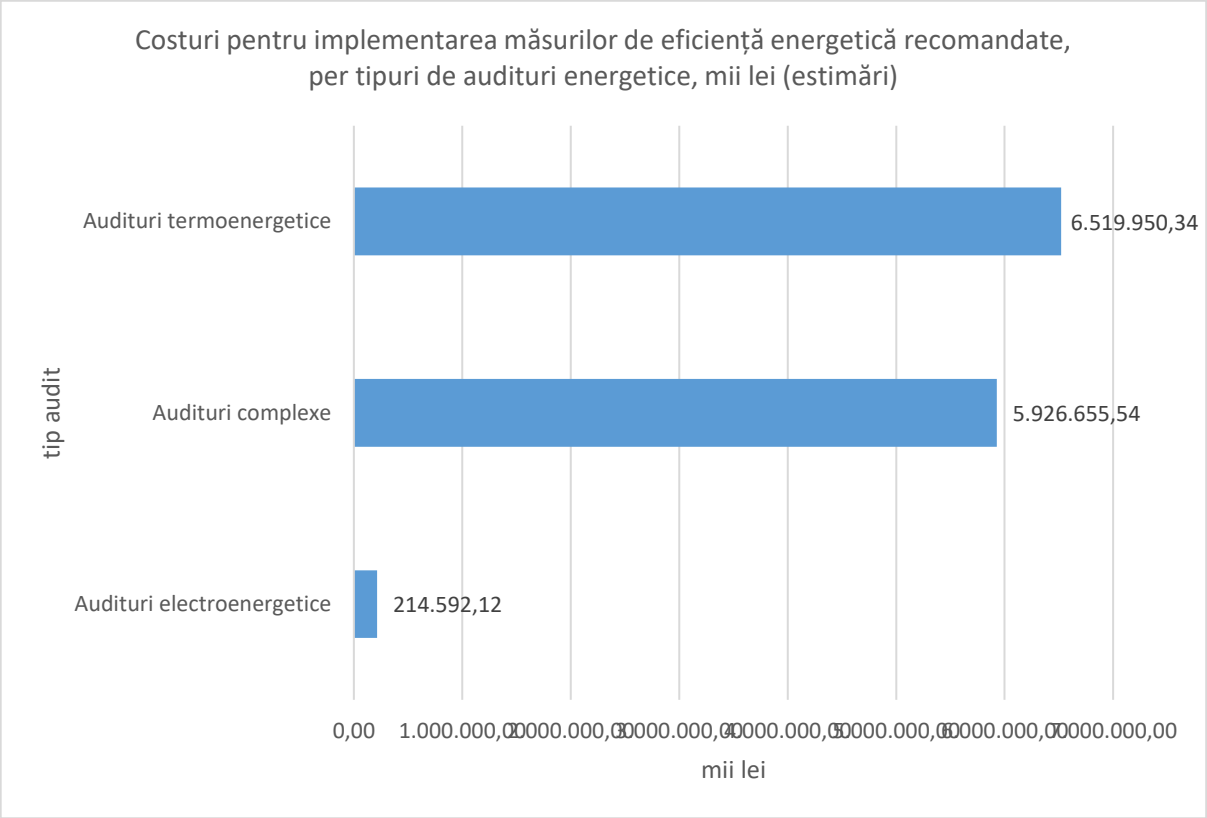
Energy savings of over 60 000 toe were estimated in the manufacturing industry, their achievement being contingent upon investment costs of over RON 250 000 thousand.
The costs are almost similar in the two abovementioned sectors, but the energy saving potential is of course higher in the manufacturing industry.

In the energy industry, the costs for the implementation of energy efficiency measures recommended by energy auditors are very high due to the fact that, in the framework of energy audits, measures were recommended which involve high financial values for their implementation, such as:

- Rehabilitation of heat networks
- Purchase of lighting fixtures with LED technology
- Mounting of photovoltaic panels
- Installation of microgeneration units
- Variable torque actuations

Figure 26

Costs for the energy efficiency measures recommended by types of energy audits



Source: ANRE

RO	EN
Costuri pentru implementarea măsurilor de eficiență energetică recomandate, per tipuri de audituri energetice, mii lei (estimări)	Costs for the implementation of the recommended energy efficiency measures by types of energy audits, thousand RON (estimates)
tip audit	type of audit
audituri termoenergetice	heat audits
audituri complexe	complex audits
audituri electroenergetice	electricity audits

mii lei	thousand RON

Having reviewed the costs estimated for the implementation of the electricity audits, we have found that, in 2018, their values are far below the costs required for the implementation of the energy efficiency measures recommended during the heat or complex audits, reaching values of over 5 billion RON.

6.3 Energy services providers

As for the activity of energy service companies approved/authorised to conclude energy management contracts with economic operators outsourcing such service, please note that, at the end of 2018, 63 energy service companies (ESC), of which 19 authorised natural persons (PFA) authorised to conclude energy management contracts, were recorded in the database of the Energy Efficiency Department.

Of the 44 legal persons approved to provide energy management services, 13 companies did not conclude energy management contracts and, of the 19 PFAs, 4 persons did not conclude energy management contracts.

The number of contracts concluded by the energy service companies and by the PFAs is listed in the table below (Table 25), according to the period for which the contract was concluded and the type of service provider, as follows:

Table 25

Number of concluded management contracts per contract period

	Total number of contracts/ category	Number of contracts concluded per period for which the contract was concluded					
		1 year	2 years	3 years	4 years	5 years	Unlimited
ESCs in the industry	207	129	17	13	11	12	25
PFAs in the industry	82	55	2	0	0	0	25
Total contracts concluded in the industrial sector	289	184	19	13	11	12	50
ESCs for localities	22	17	2	3	0	0	0
PFAs for localities	2	2	0	0	0	0	
Total management contracts concluded for localities	24	19	2	3	0	0	0

Total energy management contracts concluded	313	203	21	16	11	12	50

Source: ANRE

Of the 313 energy management contracts concluded in the industry, approximately 5 % include beneficiaries which are economic operators recording annual energy consumption below 1 000 toe, although the law does not provide for such responsibility on their part.
The remaining 95 % are energy management contracts concluded by economic operators recording annual energy consumption above 1 000 toe.

Table 26

Energy savings estimated and achieved, as recorded in the reports submitted by the energy service companies and PFAs

Activity segment	ESC		PFA		ESC + PFA	
	estimated energy savings (toe)	achieved energy savings (toe)	estimated energy savings (toe)	achieved energy savings (toe)	estimated energy savings (toe)	achieved energy savings (toe)
agriculture	596.36	1 046.7	52.9	37.5	649.26	1 084.2
energy industry	10 386.21	1 388.13	-	-	10 386.21	1 388.13
manufacture of basic metals	1 049.1	1 039.86	235.64	217.08	1 284.74	1 256.94
constructions	173.9	467.82	181.6	69.85	355.5	537.67
wood processing	209.51	167.37	1 905.23	308.53	2 114.74	475.9
textile industry	439.69	419.52	62	12.2	501.69	431.72
chemical industry	825.94	780.19	500.98	400.98	1 326.92	1 181.17
construction materials	15 142.94	13 742.49	339.24	2.6	15 482.18	13 745.09
food industry	2 149.14	4 315.30	982.96	511.71	3 132.1	4 827.01
transport	3 042.01	10 010.13	1 172	989.50	4 214.01	10 999.63
manufacturing industry	7 317.38	4 040.34	1 372.94	859.09	8 690.32	4 899.43
services	5 937.91	4 699.25	7 616.05	494.11	13 553.96	5 193.36
education			75.2	44.97	75.2	44.97
public administration	12 396.52	1 727.29	2 104	245	14 500.52	1 972.29
cement industry	0.07	0.07	-	-	0.07	0.07
telecommunication	108.72	89.22	-	-	108.72	89.22
TOTAL	59 775.40	43 933.68	16 600.74	4 193.12	76 376.14	48 126.80

Source: ANRE

Table 27

The estimated energy saving potential reported for 313 economic operators which outsourced the energy management service

Energy service provider	Number of energy management contracts	Annual total energy consumption subject to energy assessments (toe/year)	Estimated energy savings (toe/year)	Estimated energy saving potential (%)
PFA	84	277 149.64	16 600.74	5.98 %
ESC	229	1 898 829.98	59 775.4	3.14 %
PFA + ESC	313	2 175 979.62	76 376.14	3.5 %

Source: ANRE

The energy service companies and PFAs also reported that, following the implementation of the energy efficiency measures under the energy efficiency improvement programmes, energy savings of 48 126.80 toe were achieved. Please note that these energy savings are reported for the 313 economic operators which outsourced the energy management service and are related to the energy efficiency measures provided as examples in the reports received from the energy service companies, including the PFAs.

6.4 Authorisation of legal persons involved in the business of assembly and operation of cost allocation systems for heat and hot water for consumption in condominium type buildings

In accordance with Law No 121/2014 on energy efficiency, as subsequently amended and supplemented, "*in the condominiums connected to the centralised heat supply system it is mandatory to mount meters by 31 December 2016 in order to separately record energy consumption for heating/cooling and hot water at the level of each apartment or space having other destination*". However, if the use of the individual meters is **not** technically feasible or economically effective, the law provides for **the obligation to mount individual cost allocators** "*on all the heating devices in each building space*".

In accordance with Article V(4) of Law No 225/2016 amending and supplementing Law No 51/2006 on the community public utility services, as subsequently supplemented, corroborated by Article 14 of Law No 325/2006 on the public heat supply service, as subsequently amended, the authorisation of legal persons mounting and using cost allocation systems in condominiums was taken over by the DEFE of ANRE.

Until the entry into force of Law No 225/2016 amending and supplementing Law No 51/2006 on the community public utility services, as subsequently supplemented, this activity was performed by the National Regulatory Authority for Community Public Utility Services (*Autoritatea Națională de Reglementare în domeniul Serviciilor Comunitare de Utilităţi Publice - ANRSC*) in accordance with Order No 259/2004 of the President of the National Regulatory Authority for Public Communal Management Services (*Autoritatea Națională de Reglementare pentru Serviciile Publice de Gospodărie Comunală*) approving the rules for authorisation in the mounting and operation of cost allocation systems for heat and hot water for consumption in condominiums, as subsequently amended and supplemented.

In this respect, Order No 53/2017 of ANRE on the rules for authorisation of legal persons performing activities involving the mounting and operation of cost allocation systems for heat and hot water for consumption in condominiums was approved and this legislative act is to be adapted to the ANRE procedures and consistent with the amendments introduced by Law No 225/2016 amending and supplementing Law No 51/2006 on community public utility services, as subsequently supplemented.

The aim of these Rules was for ANRE to establish the following aspects:
a) the conditions for the release, extension, amendment, suspension, withdrawal or duplicate release of the following types of authorisation:
(i) type I - for the mounting of cost allocation systems for heating;
(ii) type II - for the operation of cost allocation systems for heating;
(iii) type III - for the mounting of hot water meters used as cost meters;
(iv) type IV - for the operation of hot water meters used as cost meters.
b) the procedure for the application for and the release of the types of authorisations under point (a);
c) the procedure of extension, amendment, suspension or withdrawal of the types of authorisations under point (a).
The legal provisions apply to:
a) Romanian and foreign legal persons requesting authorisation for the mounting and operation of cost allocation systems for heating and hot water for consumption in condominiums within the territory of Romania in accordance with the laws and rules in force;
b) Romanian and foreign legal persons which, on the basis of the obtained authorisations, are involved in the business of assembly and operation of cost allocation systems for heat and hot water for consumption in condominiums.

The rules also include provisions regarding:
a) the documentation which must be submitted by applicants to obtain each type of mentioned authorisation;
b) the authorisation procedure;
c) the method of payment for the authorisation fee;
d) the documentation and procedure for the extension, amendment, release of duplicate authorisations;
e) the cases when the authorisations are suspended and/or withdrawn;
f) the validity terms for each type of authorisation;
g) final provisions.

The authorisation of legal persons involved in the business of assembly and operation of cost allocation systems for heat and hot water for consumption in condominium type buildings supports the improvement of efficiency in heat consumption and the development of the energy service market regarding cost allocation.
In 2018, the following applications submitted by legal persons to obtain the authorisations required in order to conduct their business involving the mounting and/or operation of cost allocation systems for heating and hot water for consumption in condominiums were assessed:

Table 28 - Applications received and assessed for the authorisation of legal persons involved in the business of assembly and operation of cost allocation systems for heat and hot water for consumption in condominiums

Applications	The Authorising Commission's resolution		Total applications
	Approved	Rejected	

New authorisation	6*	9	15
Withdrawal of authorisation for field offices	14		14
Amendment of authorisation		2	2
Total applications	20	11	31

* The authorisations released by ANRE are valid throughout the national territory. The award of new authorisations by ANRE entails termination of the validity of all the authorisations issued for the field offices by ANRSC.

The Register of legal persons involved in the business of assembly and operation of cost allocation systems for heat and hot water for consumption in condominiums, which is published on the ANRE website under the Energy Efficiency/Public Information (*Eficienţă Energetică/Informaţii de interes public*) section, includes useful information on the type of authorisations held by these legal persons, the type of mounted/operated allocators, data regarding the authorisations (issue date, expiry date), contact details.

20 legal persons are listed in this register on 30 March 2019, of which five holding authorisations issued by ANRE, which are valid within the territory of Romania (for the type of activities indicated in the register). The remaining 15 legal persons conduct their business under the authorisations issued by ANRSC, which are valid for various field offices (as per the register).

7. ACHIEVEMENT OF EU TARGETS

- **The progress recorded in the achievement of the national energy efficiency target of reducing primary energy consumption by 19 % until 2020**

The national indicative **energy efficiency** target is based on the primary energy consumption.

Romania established the indicative national energy efficiency target for 2020 to achieve **energy savings of 10 million toe**, which represents a 19 % **reduction in the forecasted primary energy consumption (52.99 million toe)** in the PRIMES 2007 model for the realistic scenario.

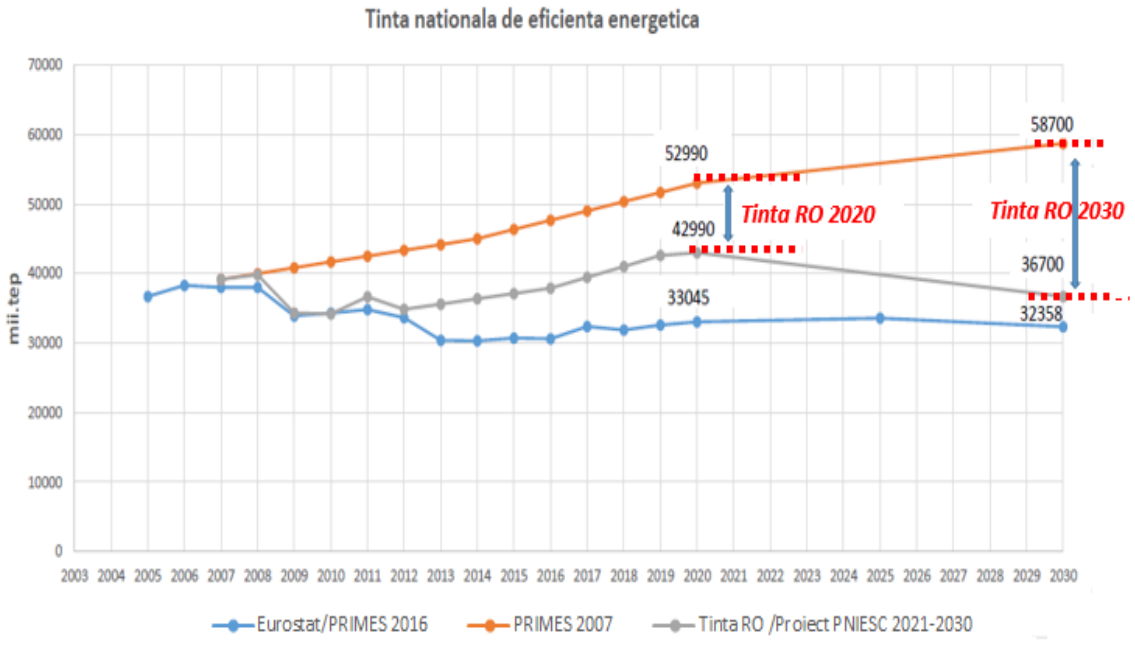
Achieving this target implies that in 2020 primary energy consumption will be **42.99 million toe**, while total energy consumption will be **30.32 million toe**.

Thus, in accordance with the **Country Report (2009) 1022 final of 27 February 2019 for Romania, the European Commission considers that Romania is on schedule and that it will reach its energy efficiency target, as established for 2020, i.e. 43 Mtoe, which is expressed in primary energy consumption (30.3 Mtoe expressed in final energy consumption).** However, both primary and final energy consumption increased in 2017, and therefore continued efforts are needed to limit energy consumption in a context of economic growth.

However, this growth in primary consumption and in final energy consumption was achieved in 2017 at European level in the 20 EU Member States and, in September 2018, the European Commission set up a working group to identify the causes of these trends and the solutions required in order to reach the energy efficiency targets in 2020.

Figure 27 presents the target of Romania for 2020 and 2030, as related to the PRIMES 2007 forecast, and the scenario developed by PRIMES 2016, which shows the constant placement of primary energy consumption below the forecast curve, which denotes that the 2020 target may be reached following the reduction in consumption through the conjugated effect of economy restructuring and the energy efficiency policy.

Figure 27



Source: ANRE

RO	EN
Ținta națională de eficiență energetică	National energy efficiency target

Mii tep	Thousand toe
Ținta RO 2020	RO 2020 target
Ținta RO 2030	RO 2030 target
Eurostat/Primes 2016	Eurostat/Primes 2016
Primes 2017	Primes 2017
Ținta RO/Proiect PINESC 2021-2030	RO target/PINESC 2021-2030 Project

- **Progress recorded in the promotion of electricity from renewable energy sources**

Legislative developments in regard to promoting the production of electricity from renewable sources (data provided by the General Directorate for Energy Efficiency, Renewable Sources, Cogeneration and Heat)

The promotion of production of electricity from renewable energy sources (RES-E) is a stringent necessity of the current period at EU level, which is justified by: environmental protection, increase of energy independence from imports by diversification of energy supply sources, and by economic and social cohesion reasons. Consequently, considering the relatively high level of the investment costs for the production of RES-E, all the European states established RES-E support systems.

In this context, by **Government Decision No 1892/2004 establishing the system for promoting the production of electricity from renewable energy sources**, the system of promotion through green certificates was established in Romania. This system is focused on competitive market mechanisms, namely the system of mandatory quotas combined with the trading of green certificates (GC).

In accordance with Law No 220/2008, the annual mandatory quotas for green certificates for 2008-2020 were established within the range 5.26 %÷16.8 %. As currently adopted, the promotion system has become more attractive for investors, introducing new facilities, including the award of a larger number of green certificates, which are differentiated by the type of RES-E production technology,

by the entry into force of Directive 2009/28/EC on the promotion of the use of energy from renewable sources. In accordance with Annex I of Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 *on the promotion of the use of energy from renewable sources*, and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC, the national target for Romania on the share of energy from renewable energy sources in the gross final consumption of energy, which is to be achieved by 2020, is 24 %.

Moreover, in accordance with Article 4(3) of Directive 2009/28/EC, the RES-E National Action Plan was developed by the Romanian authorities and submitted to the European Commission in September 2010, and it reiterates Romania's commitment to reach the national targets regarding the rate of electricity produced from renewable energy sources in the final electricity consumption with consideration to 2010, 2015 and 2020, namely 33 %, 35 % and 38 %.

The system for promoting the production of RES-E, as established by Law No 220/2008, was authorised by the European Commission in its *Decision C (2011) 4938 on the State aid SA. 33134 2011/N for Romania - Green certificates for promoting electricity from renewable sources*.

In the context of the transposition of Directive 2009/28/EC, the system for promoting the production of RES-E, as established by Law No 220/2008, which was authorised by the European Commission in its *Decision C (2011) 4938 on the State aid SA. 33134 2011/N for Romania - Green certificates for promoting electricity from renewable sources* was amended by Government Emergency Order No 88/2011. In accordance with the new provisions of Law No 220/2008 at that time, the annual mandatory quotas for green certificates for 2010-2020 were established within the range 8.3 %÷20.0 %.

The system of promotion of the RES-E production, as established by Law No 220/2008, as republished, as subsequently amended and supplemented, was authorised by the European Commission in July 2011 by *Decision C (2011) 4938 regarding the State aid SA. 33134 (2011/N) for Romania - Green certificates for promoting electricity from renewable sources*, as amended in 2015 by Decision C(2015) 2886 and in 2016, by Decision C(2016) 8865/2016.

In the application of the primary law on the promotion of electricity produced from renewable energy sources, which has gone through numerous amendments and supplements in time **(Government Decision No 1892/2004 was amended and supplemented by Government Decision No 958/2006, and Law No 220/2008 was amended and supplemented by Government Order No 29/2010, Law No 139/2010, Government Emergency Order No 88/2011, Law No 134/2012, Government Emergency Order No 57/2013, Law No 23/2014, Law No 122/2015, Government Emergency Order No 24/2017 and Law No 184/2018),** ANRE prepared and subsequently amended and supplemented, whenever required, the relevant legislative framework.

In 2012, the Parliament of Romania adopted Law No 134/2012 approving Government Emergency Order No 88/2011, which amended the system of promotion through GCs.

For the purposes of this law, ANRE issued Order No 37/2012 amending and supplementing the Regulation for accreditation of producers of electricity from renewable energy sources for the application of the system of promotion through green certificates, as approved by Order No 42/2011 of ANRE.

Subsequently, Government Emergency Order No 57/2013 brought new amendments to the system of promotion through green certificates established under the law.

In the same 2013, the Methodology for monitoring the system for promoting energy from renewable energy sources through green certificates was amended under Order No 17/2013 of ANRE.

In March 2014, Law No 23/2014 approving Government Emergency Order No 57/2013 amending and supplementing Law No 220/2008 establishing the system for promoting the production of energy from renewable sources was published in Official Gazette of Romania No 184/14.3.2014.

The amendments brought to the system of promotion through green certificates, more specifically by Law No 134/2012, Government Emergency Order No 57/2013 and Law No 23/2014 were authorised by the European Commission under Decision C(2015) 2886 of 4.5.2015.

In June 2015, Law No 122/2015 approving certain measures for promoting the production of electricity from renewable energy sources, and amending and supplementing certain administrative acts was published in Official Gazette of Romania No 387/3.6.2015.

In the period January-March 2017, the following rules were issued:

- Order No 8/2017 of ANRE approving the limit values for trading green certificates and the value of an unpurchased green certificate;
- Order No 11/2017 of ANRE establishing the mandatory quota of green certificates to be purchased for 2016;
- Order No 26/2017 of ANRE repealing Articles 1 and 2(b) of Order No 8/2017 of the President of the National Energy Regulatory Authority approving the limit values for trading green certificates and the value of an unpurchased green certificate;
- Order No 27/2017 of ANRE establishing the estimated mandatory quota of green certificates to be purchased for April-December 2017.

The adoption of **Government Emergency Order No 24/2017** amending and supplementing Law No 220/2008 establishing the system of promotion of production of energy from renewable energy sources and amending certain legislative acts provided, from 1 April 2017 onward, for a balance between the producers of electricity from renewable sources and final consumers in the context of further support granted to production of energy from renewable sources so as to maintain the level of the national target of 24 %.

Government Emergency Order No 24/2017 introduced new amendments to the system of promotion through green certificates established under the law and, for its application, ANRE issued the following rules:

- Order No 77/2017 of ANRE approving the Rules of organisation and functioning of the green certificates market;
- Order No 78/2017 of ANRE approving the Methodology for establishing the annual static quantity of green certificates and the annual mandatory quotas of green certificates to be purchased;
- Order No 79/2017 of ANRE amending and supplementing the Rules for the issue of green certificates, as approved by Order No 4/2015 of the National Energy Regulatory Authority;
- Order No 110/2017 of ANRE establishing the estimated mandatory quota of green certificates to be purchased for 2018;
- Order No 127/2017 of ANRE amending Order No 77/2017 of the President of ANRE approving the Rules of organisation and functioning of the green certificate market.

The entry into force of **Law No 184/2018** approving Government Emergency Order No 24/2017 amending and supplementing Law No 220/2008 establishing the system for the promotion of energy production from renewable energy sources and amending certain legislative acts led to the amendment by ANRE of the regulatory framework as follows:

- *Order No 157/2018 of the President of ANRE approving the Methodology for determination of the annual mandatory quota of green certificates to be purchased;*
- *Order No 163/2018 of the President of ANRE amending the Regulation for the issue of green certificates*, as approved by Order No 4/2015 of ANRE, as subsequently amended and supplemented;
- *Order No 164/2018 of the President of ANRE approving the Rules for entering in the Register of Green Certificates the green certificates consumed by economic operators in order to meet their obligation to purchase green certificates for the assessment year 2018;*
- *Order No 179/2018 of the President of ANRE approving the Regulation for amending, suspending, terminating and withdrawing accreditation granted to power plants producing electricity from renewable energy sources, and laying down the rights and obligations of accredited producers of electricity;*
- *Order No 187/2018 of the President of ANRE approving the Procedure for invoicing green certificates.*

Moreover, the entry into force of Law No 184/2018 set the premises for the establishment of the regulatory framework for the electricity produced in power plants from renewable sources with installed power of not more than 27 kW, which belong to prosumers:

- *Order No 226/2018 of ANRE approving the rules for trading electricity produced in power plants from renewable energy sources with installed power of not more than 27 kW belonging to prosumers*
- *Order No 227/2018 of ANRE approving the framework contract for the sale/purchase of electricity produced by prosumers having power plants that produce electricity from renewable energy sources with installed power of not more than 27 kW per consumption site, and amending certain regulations in the energy sector*
- *Order No 228/2018 of ANRE approving the Technical Rule entitled "Technical conditions for connection to the public electricity grids for prosumers with injection of active power into the grid"*

In regard to compliance with the EU requirements on the certification of the RES-E origin, the Regulation regarding the certification of the origin of the electricity produced from renewable energy sources was promoted, and it underlay the issue by ANRE of the **Procedure for the supervision of the issue of guarantees of origin for the electricity produced from renewable energy sources, as approved by Order No 23/2004 of ANRE**. Consequently, ANRE set up the Single Register of Guarantees of Origin and, in the period 2005-2010, on a half-yearly basis, it issued guarantees of origin for the electricity produced from renewable energy sources, permanently updating the data in this register.

Following the amendment of the relevant European law, by promoting **Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC**, the rules on the certification of origin of the electricity produced from renewable energy sources needed to be reconsidered and **the Regulation for issuing and tracking guarantees of origin for the electricity produced from renewable energy sources, as approved by GD No 1232/2011 (*Regulation*)** was approved.

The system of certification of the RES-E origin proposes to enhance transparency towards the client by differentiating between the electricity produced from renewable energy sources and the electricity produced from conventional sources, and is reflected in the allocation of certificates of origin to RES-E producers.

The *regulation* establishes the framework for the organisation and functioning of the system of guarantees of origin for the production of electricity from renewable energy sources in order to prove that electricity or a rate in it, which is supplied to a final consumer by its supplier, is produced from renewable energy sources.

The guarantees of origin issued on grounds of the *Regulation* are used by the electricity supplier, at the request of a final consumer, to ascertain the accuracy of the information included on the electricity label.

In order to enforce the provisions of **Government Decision No 1232/2011**, ANRE deployed the web application for the issue and tracking of guarantees of origin on a secured website developed specifically for this purpose. With the development of the application, from February 2013 onward, a new single register of guarantees of origin became operational in an electronic format, including information on the guarantees of origin issued, transferred or withdrawn.

At the same time, ANRE monitors the situation of guarantees of origin for the electricity produced from renewable energy sources, and the outputs are included in an annual report published on the ANRE website by 31 March of each calendar year.

From 2013 onward, the Reports on the monitoring of guarantees of origin for the electricity produced from renewable energy sources and supplied to the electricity networks are found on the website of ANRE.

- *Monitoring of the system for promotion of electricity from renewable energy sources through green certificates*

By annually monitoring the system of promotion of electricity from renewable energy sources through green certificates, ANRE aims at:

- evaluating the functionality of the support scheme through green certificates and its efficacy towards the national targets set under the law in regard to the RES-E share in the gross final consumption of energy;
- assessing the efficiency of the GC support scheme with reference to the required financial effort;

- establishing whether, following the application of the green certificate support scheme, the RES-E production is overcompensated;
- evaluating the functioning of the green certificates market under conditions of transparency and non-discrimination, in accordance with the legal provisions;

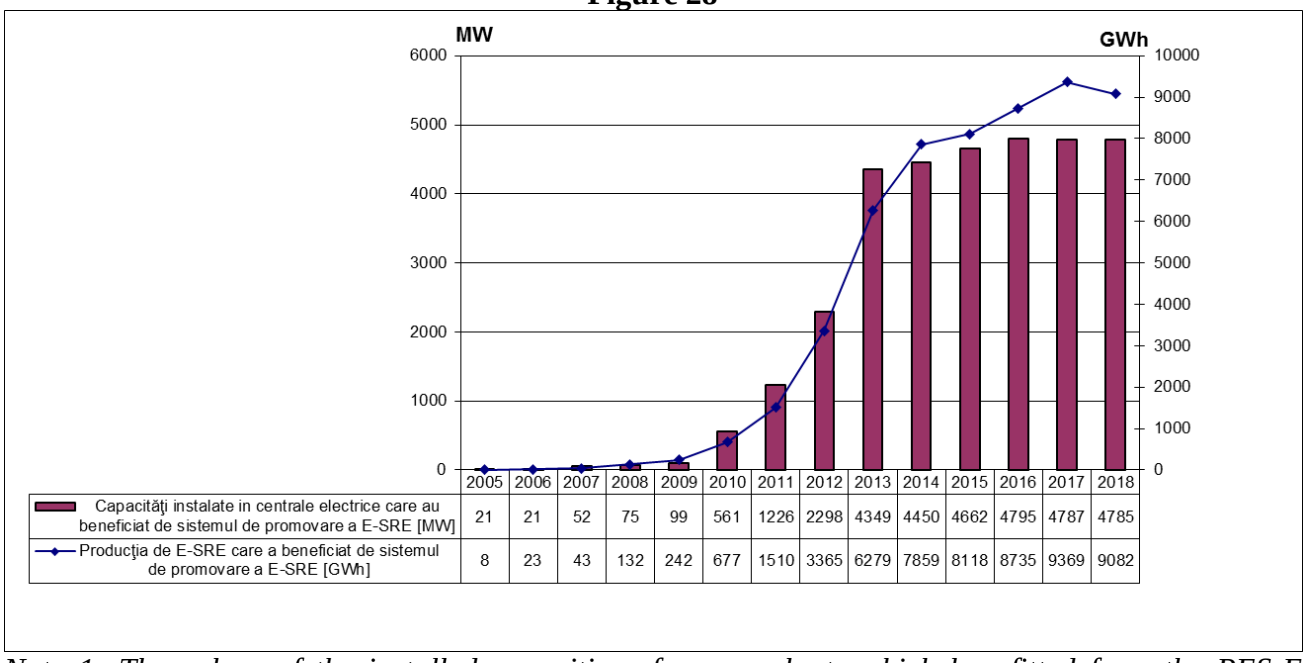
- *Results from the functioning of the system for promotion of electricity from renewable energy sources through green certificates*

The system for promotion of electricity from renewable energy sources through green certificates has been operational since 2005.

Below is the trend of the main indicators in this sector for the period 2005-2018;

- The trend in the installed power capacity in power plants which benefitted from the system of promotion of RES-E and electricity produced in these plants for the period 2015-2017 is shown in Figure 28.

Figure 28



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Capacităţi instalate in centrale electrice care au beneficiat de sistemul de promovare a E-SRE [MW]	21	21	52	75	99	561	1226	2298	4349	4450	4662	4795	4787	4785
Producţia de E-SRE care a beneficiat de sistemul de promovare a E-SRE [GWh]	8	23	43	132	242	677	1510	3365	6279	7859	8118	8735	9369	9082

Note 1: The values of the installed capacities of power plants which benefitted from the RES-E promotion system pertain to each calendar year end

RO	EN
Capacităţi instalate în centrale electrice care au beneficiat de sistemul de promovare a E-SRE [MW]	The installed capacity of power plants which benefitted from the E-RES promotion system [MW]
Producţia de E-SRE care a beneficiat de sistemul de promovare a E-SRE [GWh]	The RES-E production benefitting from the RES-E promotion system [GWh]

The annual mandatory quota for GC purchases, as established by ANRE, is the number of GCs which an electricity supplier must purchase for each MWh of electricity sold to consumers.
From the entry into force of Government Emergency Order No 24/2017, the electricity suppliers had the obligation to purchase annually a number of green certificates resulted from the calculation of the

annual mandatory quota of GCs taking into account the annual static amount of GCs and the final electricity consumption, without exceeding the average impact of EUR 11.1/MWh on the invoice of the final consumer, as established, considering the weighted average price of the transactions on the spot market of GCs from the previous year. Subsequently, with the entry into force of Law No 184/2018, electricity suppliers must purchase annually a number of green certificates as the equivalent of the product of the value of the mandatory quota for purchase of green certificates established for that year in accordance with Article 4(9^1) of the Law by the amount of electricity from the previous year, so that the average impact on the final consumer is not more than EUR 11.7/MWh in 2018, EUR 12.5/MWh in 2019, EUR 13/MWh in 2020 and 2021 and EUR 14.5/MWh from 2022 onward. The value in RON is calculated at the value of the average exchange rate established by the National Romanian Bank (*Banca Naţională a României*) for the previous year and the price in the green certificates used for the previous year is calculated as a weighted average value of the price in the green certificates from the transactions on the centralised anonymous spot market of green certificates in the previous year.

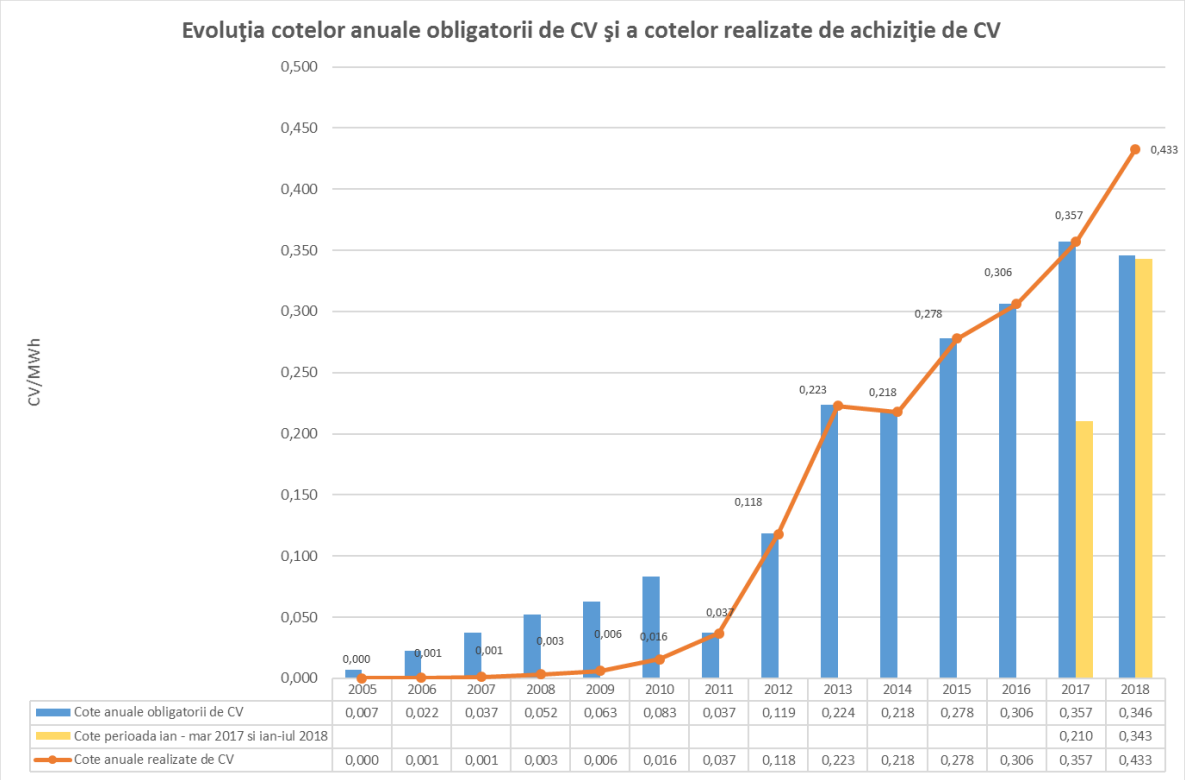
When it established the GC purchase quotas, by 31 March 2016, ANRE considered the number of GCs issued on the basis of the information regarding the electricity produced from renewable energy sources for 2018 and the final electricity consumption for 2018.

Thus, for 2018, ANRE established the mandatory GC purchase quota as follows:

a) for January-July 2018, the value of the annual mandatory quota for the purchase of green certificates was 0.343 GCs/MWh and was set on the basis of the static GC amount for the indicated period and of the final electricity consumption, from which the final electricity consumption excepted from that period is deducted, without exceeding the average impact of EUR 11.1/MWh on the consumer;
b) for August-December 2018, the value of the annual mandatory quota for the purchase of green certificates was 0.433 GCs/MWh and was set on the basis of the number of green certificates sustained by the system of promotion through green certificates in the indicated period, and of the final electricity consumption, from which the final electricity consumption excepted from that period is deducted, being determined so that the average impact on the consumer for 2018 is not more than EUR 11.7/MWh.

- The trend in the annual mandatory quotas of GCs and in the quotas of purchased GCs achieved by economic operators obliged to purchase green certificates, in the period 2015-2018, is shown in Figure 29.

Figure 29



RO	EN
Evoluția cotelor anuale obligatorii de CV și a cotelor realizate de achiziție de CV	The trend in the annual mandatory quotas of GCs and in the quotas of purchased GCs achieved
Cotele obligatorii anuale de CV	Annual mandatory quotas of GCs
Cote perioada ian-mar 2017 și ian-iul 2018	Quotas for January-March 2017 and January-July 2018
Cote anuale realizate de CV	Annual quotas of GCs

Note: *The mandatory quota for green certificates purchase for 2017 was:*

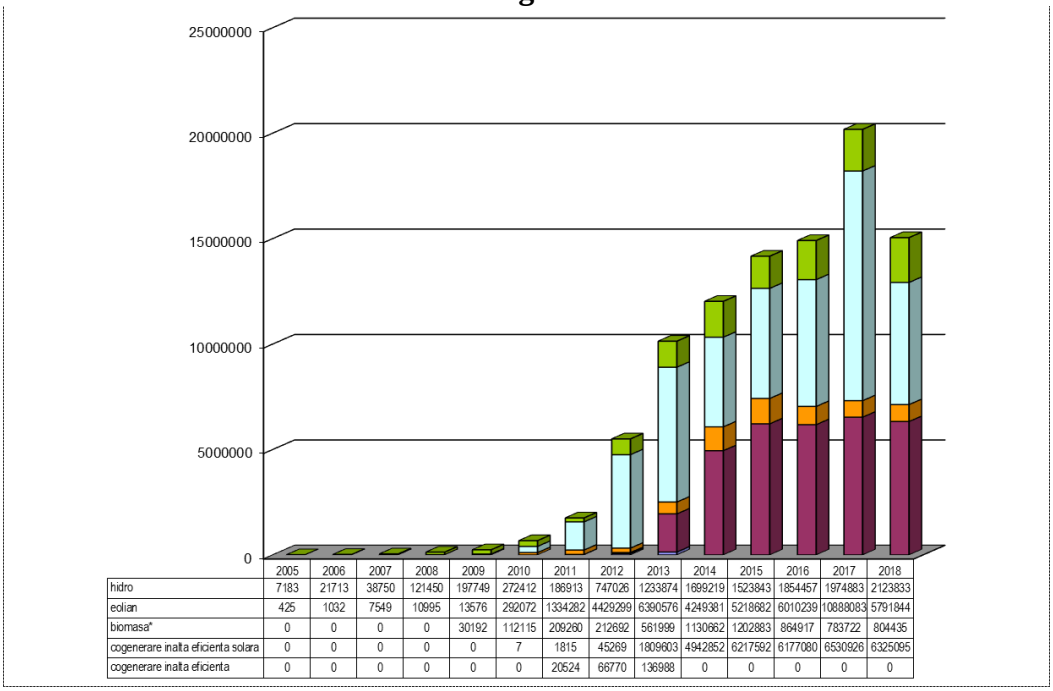
- *for the period January-March 2017 at the value of: 0.210 GC/MWh;*
- *for the period April-December 2017 at the value of: 0.357 GC/MWh.*

The mandatory quota for green certificates purchase for 2018 was:

- *for the period January-July 2018 at the value of 0.343 GC/MWh*
- *for the period August-December 2018 at the value of 0.433 GC/MWh*

The annual trend in the number of GCs issued from the implementation date of the RES-E promotion system to this date is shown in Figure 30.

Figure 30



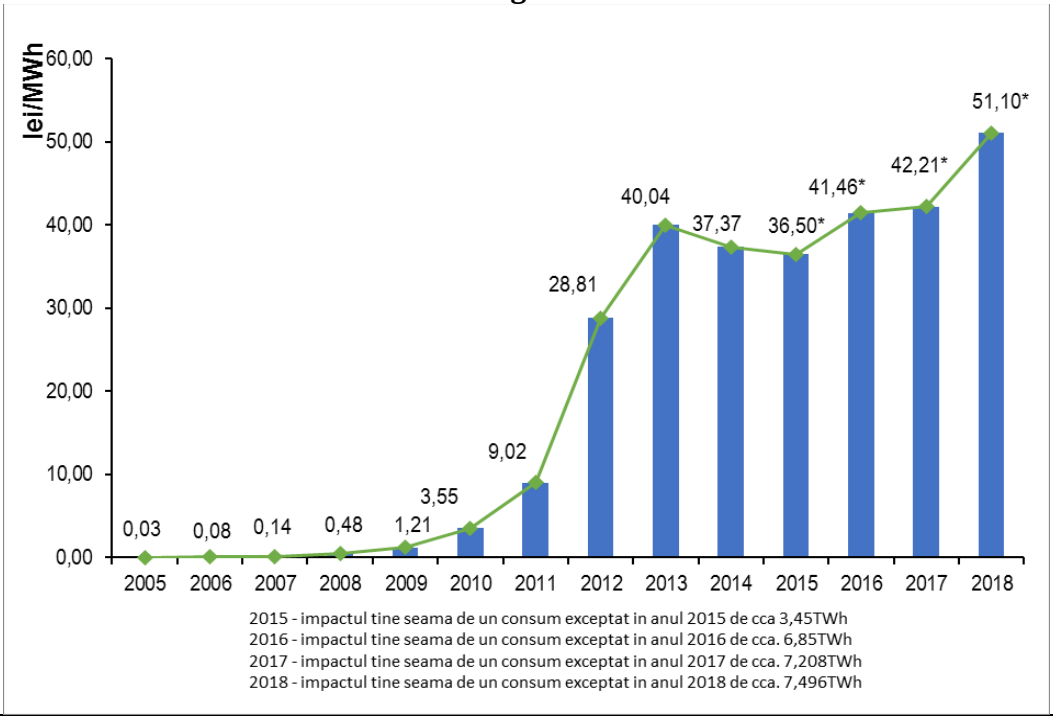
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
hidro	7183	21713	38750	121450	197749	272412	186913	747026	1233874	1699219	1523843	1854457	1974883	2123833
eolian	425	1032	7549	10995	13576	292072	1334282	4429299	6390576	4249381	5218682	6010239	10888083	5791844
biomasa*	0	0	0	0	30192	112115	209260	212692	561999	1130662	1202883	864917	783722	804435
cogenerare inalta eficienta solara	0	0	0	0	0	7	1815	45269	1809603	4942852	6217592	6177080	6530926	6325095
cogenerare inalta eficienta	0	0	0	0	0	0	20524	66770	136988	0	0	0	0	0

*the value of the biomass also includes high-efficiency cogeneration

RO	EN
hidro	hydro
edian	wind
biomasa*	biomass*
cogenerare înaltă eficiență solară	high-efficiency solar cogeneration
cogenerare înaltă eficiență	high-efficiency cogeneration

- The trend in the impact of the implementation of the RES-E promotion system on the electricity price at the final consumer, for the period 2005-2018, is shown in Figure 31.

Figure 31

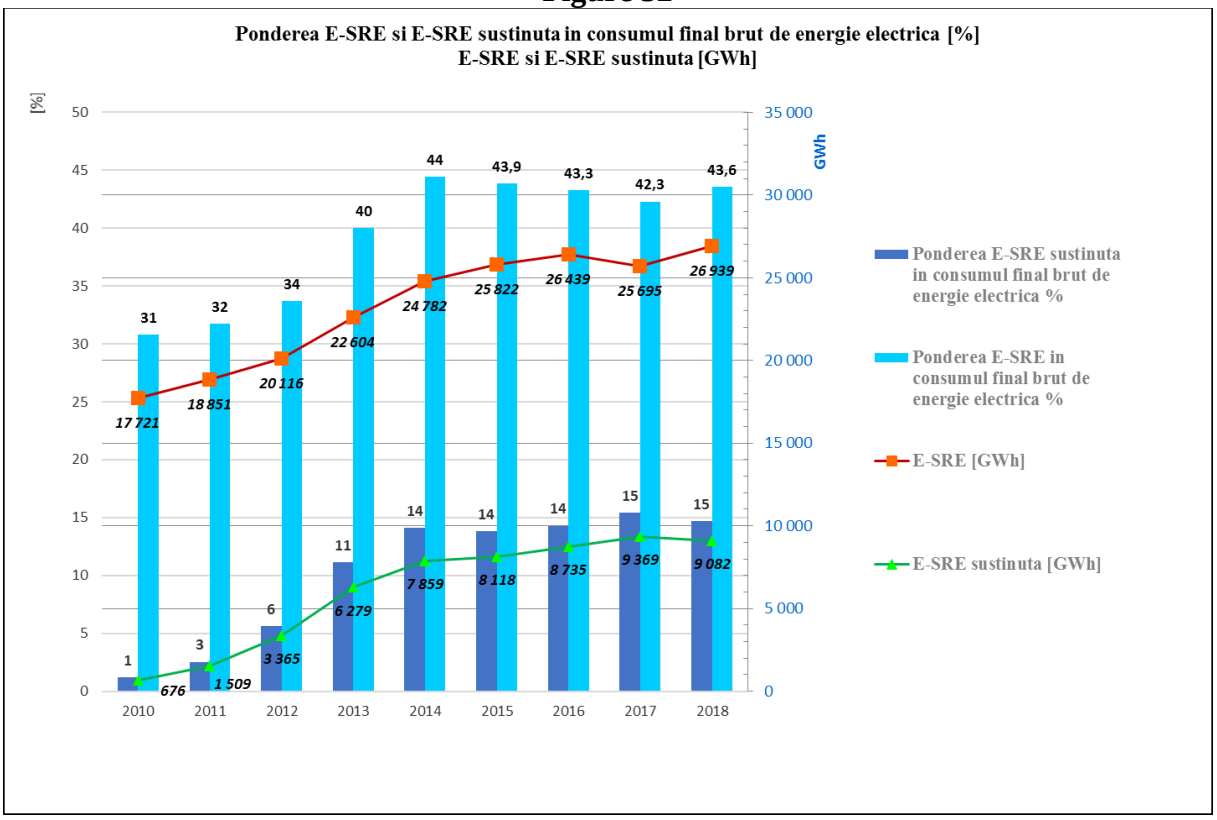


RO	EN
2015 – impactul ține seama de un consum exceptat în anul 2015 de cca 3,45 TWh	2015 – the impact takes into account an exempted consumption of approximately 3.45 TWh in 2015
2016 – impactul ține seama de un consum exceptat în anul 2016 de cca 6,85 TWh	2016 – the impact takes into account an exempted consumption of approximately 6.85 TWh in 2016
2017 – impactul ține seama de un consum exceptat în anul 2017 de cca 7,208 TWh	2017 – the impact takes into account an exempted consumption of approximately 7.208 TWh in 2017
2018 – impactul ține seama de un consum exceptat în anul 2018 de cca 7,496 TWh	2018 – the impact takes into account an exempted consumption of approximately 7.496 TWh in 2018

With the application of the mandatory quota for GC purchase, the average impact of green certificates on the invoice of the final electricity consumer for 2018 is EUR 11/MWh (RON 51.1/MWh), which is below the legal limit of EUR 11.7/MWh, namely RON 54.446/MWh.

- The trend towards the achievement of the RES-E national target in the gross final consumption of electricity for Romania in the period 2005-2018 is shown in Figure 32.

Figure 32



**estimated value*

RO	EN
Ponderea E-SRE și E-SRE susținută în consumul final brut de energie electrică [%]	Share of RES-E and sustained RES-E in the gross final energy consumption [%]
E-SRE și E-SRE susținută [GWh]	RES-E and sustained RES-E [GWh]
Ponderea E-SRE susținută în consumul final brut de energie electrică %	Share of RES-E in the gross final energy consumption %
Ponderea E-SRE în consumul final brut de energie electrică %	Share of RES-E in the gross final energy consumption %
E-SRE [GWh]	RES-E [GWh]
E-SRE susținută [GWh]	Sustained RES-E [GWh]

In accordance with the Methodology for **monitoring the system of promotion of energy from renewable energy sources through green certificates**, ANRE assesses the statement of costs and revenues of producers of electricity from renewable energy sources which benefit from the system of promotion through green certificates based on the data submitted by the accredited producers.

The submitted data is processed as per the model calculation used in the notification of the support scheme authorised by Commission Decision C(2011) 4938 of 13.7.2011: State aid SA 33134 – Romania – "Green certificates for promoting electricity from renewable sources".

The system of promotion through green certificates, as established under the law, is applicable to producers for the electricity produced from renewable energy sources, including for the electricity produced in the test period, under the accreditation decision issued by ANRE for commissioning and refurbishment of units/plants taking place by the end of 2016.

The cost-benefit analysis, with the update for the 2018 analysis year at an aggregated level for each category of RES-E production technology, taking into account the indicators resulting from the mean

value of costs and according to the capacities planned by the end of 2016[1], has identified no risk of overcompensation.

The Report on the overcompensation assessment regarding the system of promotion of electricity from renewable energy sources through green certificates for 2018 includes values of the internal rate of return which are comparable to or slightly above the reference value in the Commission decision C(2015) 2886 for:

- hydro-power plants (installed power below 10 MW) for installed facilities covered by the scheme in 2016;
- biomass cogeneration plants for installed facilities covered by the scheme in 2015.

The results of the overcompensation assessment, which is carried out in the analysis year, are included in a report to be published on the ANRE website by 31 March of each calendar year.

[1] The system of promotion through green certificates, as established under the law, was applicable to producers for the electricity produced from renewable energy sources, including for the electricity produced in the test period, under the accreditation decision issued by ANRE for commissioning and refurbishment of units/plants taking place by 4 January 2017.

8. DEGREE OF ENERGY INDEPENDENCE

According to the INS definition in the 2018 Statistical Directory, "The degree of energy independence is expressed in rates and represents the ratio between the primary energy production and the amount of primary energy available in the reference period. This amount is calculated by deducting export and stocks from the energy sources at the end of the reference period."

Table 29 Degree of energy independence for 2010-2017 (%)

No		2010	2011	2012	2013	2014	2015	2016	2017
		%	%	%	%	%	%	%	%
1	**Total (including energy products obtained and consumed in the population's households)**	78.8	77	77.7	81.7	83.4	82.9	78.4	76.1
2	**Coal (including coke)**	85.4	81.8	84	81.9	77.8	80.4	80.3	83.1
3	**Crude Oil**	41.5	42.8	43.9	43.4	38.2	37.6	33.1	31.1
4	**Natural gas (excluding gasoline and ethane from the extraction units included in the crude oil section)**	79.9	78	80.3	87.8	93.6	98.4	86.4	88.6

Source: Statistical Directory for 2018

9. ENERGY POVERTY

Energy poverty and the vulnerable energy consumer

Energy poverty is a major challenge within the EU and it originates in the low income and the energetically inefficient households. In this respect, the European Commission included the interests of vulnerable consumers in the new European law prepared in the framework of the targets under ***Europa 2030 and Energy Union***.

One of the core objectives of the Europa 2020 strategy is to reduce the number of persons exposed to the risk of poverty or social exclusion in the EU.

According to Eurostat, **22.5 % of the European citizens were exposed to the risk of poverty in 2016, i.e. 112.9 million persons.** According to the Eurostat data for 2017, the countries where inhabitants are the least exposed to social exclusion are the Czech Republic (12.2 %), Finland (15.7 %) and Denmark (17.2 %). At the opposite end are Bulgaria (38.9 %), **Romania (35.7 %)** and Greece (34.8 %).

As regards the aim to reduce the number of people at risk of poverty or social exclusion, which is expressed in absolute number of people: **580 000 in the Country Report SWD (2019) 1022 final of 27 February 2019 for Romania, the following are stated:**

"The national target of 580 000 people is already considered reached. The population taken out of poverty or social exclusion in 2017 was of 2 074 000 persons, considerably higher than in the previous years (e.g. 1 420 000 in 2016, 1 680 000 in 2015)."

The package of legislative measures ***Clean Energy for All Europeans*** establishes a new approach to the protection of vulnerable consumers, which also includes supporting Member States in their reduction of energy costs for consumers by supporting energy efficiency investments. The Commission requests Member States to take into account energy poverty, providing that part of the energy efficiency measures be implemented as a priority for the households affected by energy poverty and for social housing. Their long-term strategies for renovation of buildings should also contribute to the reduction of energy poverty.

The "Clean Energy for All Europeans" legislative proposals will reduce the energy poverty by increasing the affordability of expenses incurred by household consumers. The population health may be improved by rehabilitating buildings with modern low NOx emission heating systems and properly heated households reduce humidity.

The European legislative package also includes certain measures meant to protect the most vulnerable consumers of energy. Only a few EU Member States have national law including the concept of energy poverty and there is no consensus on the legal definition of the term.

Member States are obliged to measure and to monitor energy poverty and to submit reports to the European Commission every two years, and the Commission will enable the good practice exchange by setting up the *Energy Poverty Observatory*. *In this respect, under the European Energy Poverty Observatory project*, the EU Energy Poverty Observatory platform was launched in Brussels on 29 January 2018, a portal dedicated to energy poverty intended to be an aggregator of statistical information meant to encompass the multiform reality of this concept.

Law No 123/2012 on electricity and natural gas defines "the vulnerable client" as the final client belonging to a category of household clients who, on grounds of age, health or low income,

are at risk of social marginalisation, and who, in order to prevent such risk, benefit from social protection measures, including financial measures. Social protection measures and the eligibility criteria for them are established under legislative acts. Vulnerable clients shall be the main beneficiaries of the social aid envisaged in the process of gradual relinquishment of regulated prices/tariffs."

Law No 196/2016 on the minimum inclusion income, as published in Official Gazette of Romania, Part I, No 882 of 3 November 2016, will repeal Government Emergency Order No 70/2011 on social protection measures in the cold season, as subsequently amended and supplemented. For the purposes of this law, **the vulnerable consumer is defined as "the household client, as a single person or the family which cannot cover, from their own budget, the full heating costs for the household and the income of which is within the limits set under this law".**

Law No 196/2016 defines ***energy poverty*** **as the vulnerable consumer's impossibility to provide for their minimal energy needs for the optimal heating of the household during the cold season.**

In accordance with Government Emergency Order No 96/9 November 2018, Law No 196/2016 on the minimum inclusion income will enter into force on 1 April 2019.

ANRE, through the Energy Efficiency Department, took over the annual presidency and the Secretariat of the EnR Association - *the Association of national energy efficiency agencies in Europe* from 23 February 2017 to 22 February 2018, with a view to coordinating the EnR activities at European level, including the development of the topic proposed with regard to ***energy poverty at European and national level.***

In the period February 2017-February 2018, ANRE coordinated information and good practices exchange in the field of energy efficiency with a view to developing the proposed topic regarding *energy poverty at European and national level,* in the framework of the new European law prepared in accordance with the strategies of *Europa 2030* and *Energy Union - Clean Energy for All Europeans*. At the same time, representatives of the Energy Efficiency Agencies from Member States, and experts from CNR-CME, the Romanian Energy Centre, the Democracy Study Centre etc. participated in the EnR events organised by ANRE/DEFE in 2017 and 2018.

The energy poverty topic proposed by ANRE/DEFE for the period of its 2017 EnR Presidency was extremely well received at national and European level and the European peers contributed with national good practices in order to strengthen the EnR position document on energy poverty at European level and to ensure the continuity of this topic by the 2018 EnR Presidency - ENEA Italy, with a view to approving the Clean Energy Package in 2018.

In the context of the national energy targets regarding the energy efficiency increase, ANRE fosters, through the Energy Efficiency Department, a constructive dialogue with all the stakeholders in order to include the interests of vulnerable consumers and in energy poverty in the revised European and national energy and energy efficiency legislative framework.

About the EnR Association - *the Association of national energy efficiency agencies* in Europe:

ANRE is a member of the EnR Association - *the Association of national energy efficiency agencies* in Europe, which comprises 24 European energy agencies responsible for the preparation,

implementation or review of national research, development or dissemination programmes in the fields of energy efficiency, renewable energy and climate changes, with the purpose of strengthening cooperation between member agencies and other European stakeholders with regard to all the relevant aspects for sustainable energy.

- Two meetings are organised annually, i.e. EnR Full and Regular Meeting and EnR Regular Meeting, with the attendance of all the members, where the internal issues of the EnR Association are raised and activity reports of working groups are presented.

- An important EnR event, which is organised annually, is Thinking Group Meeting, therein participating the managing staff of the national energy agencies in Europe.

- Information is mainly exchanged through the eight working groups and it is also open to other relevant third party organisations wishing to become members of EnR. Also, in addition to their role in the dissemination of information, working groups serve as forums for the preparation and implementation of joint projects under the programmes funded by the European Union, such as the Horizon 2020 Programme of the European Commission.

The eight working groups of the EnR Association are:

- the Behaviour Change Working Group
- the Buildings Working Group
- the Energy Efficiency Working Group
- the Working Group on Industry
- the Labelling and Ecodesign Working Group
- the Monitoring Tools Working Group
- the Renewable Energy Working Group
- the Transport Working Group

10. CONCLUSIONS

1. In the national targets under the Europa 2020, as claimed by Romania regarding the *Energy and climate changes under the 2018 National Reform Programme (NRP),* **the increase in energy efficiency is one of the three national priorities**, alongside the reduction in the greenhouse gas emissions and the increase in the rate of energy produced from renewable sources in the gross final consumption of energy.

On **30 November 2016**, in the context of the ***Europa 2030 and Energy Union*** targets, **the European Commission** published the package of legislative measures ***Clean Energy for All Europeans***, which concerns **three main objectives**:

- **for the European Union to assign a prime role to energy efficiency,**
- **for Europe to become the global leader in renewables and**
- **to provide consumers with a fair solution.**

The "Clean Energy for All Europeans" legislative proposals cover energy efficiency, renewable energy, the design of the electricity market, security of electricity supply and governance rules for the Energy Union. In addition the Commission proposes a new way forward for Ecodesign as well as a strategy for connected and automated mobility.

At the same time, the **2030** European targets for the increase in energy efficiency and in the rate of energy produced from renewable sources in gross final consumption of energy were approved at the rates of 32.5 % and 32 %, respectively, with a review in 2023.

In July 2018 **the new Directive (EU) 2018/844 of 30 May 2018 amending Directive 2010/31/EU on the energy performance of buildings and Directive 2012/27/EU on energy efficiency.** It is not by chance that this directive was the first to be approved among the eight legislative acts composing the new European legislative package (four directives and four European regulations), considering the huge energy saving potential in the sector of buildings, Europe's largest energy consumer (with 40 % final energy consumption, 45 % in Romania) being also responsible for one third of the CO2 emissions in Europe.

For buildings, through the revision of the Directive on the energy performance of buildings, the European Commission fosters the deployment of innovative and smart technologies in buildings; at the same time, Article 4 of the Energy Efficiency Directive was inserted in the revised version of the Directive on the energy performance of buildings, which also includes additional measures on energy poverty. At European level, two thirds of the buildings were built before the construction standards have been prepared and the renovation rate is approximately 1 %.

The new building regulations will reduce energy poverty by increasing the affordability of the household consumers' expenses. The population health may be improved by rehabilitating buildings with modern low NOx emission heating systems and properly heated households reduce humidity.

After two years of debates (2016-2018), **the revised Directive (EU) No 2018/2002 on energy efficiency and the revised Directive (EU) 2018/2001 on the promotion of the use of energy from renewable sources** were published in Official Journal of the European Union on 21 December 2018 in order to create a sustainable national legislative framework for the following energy decade.

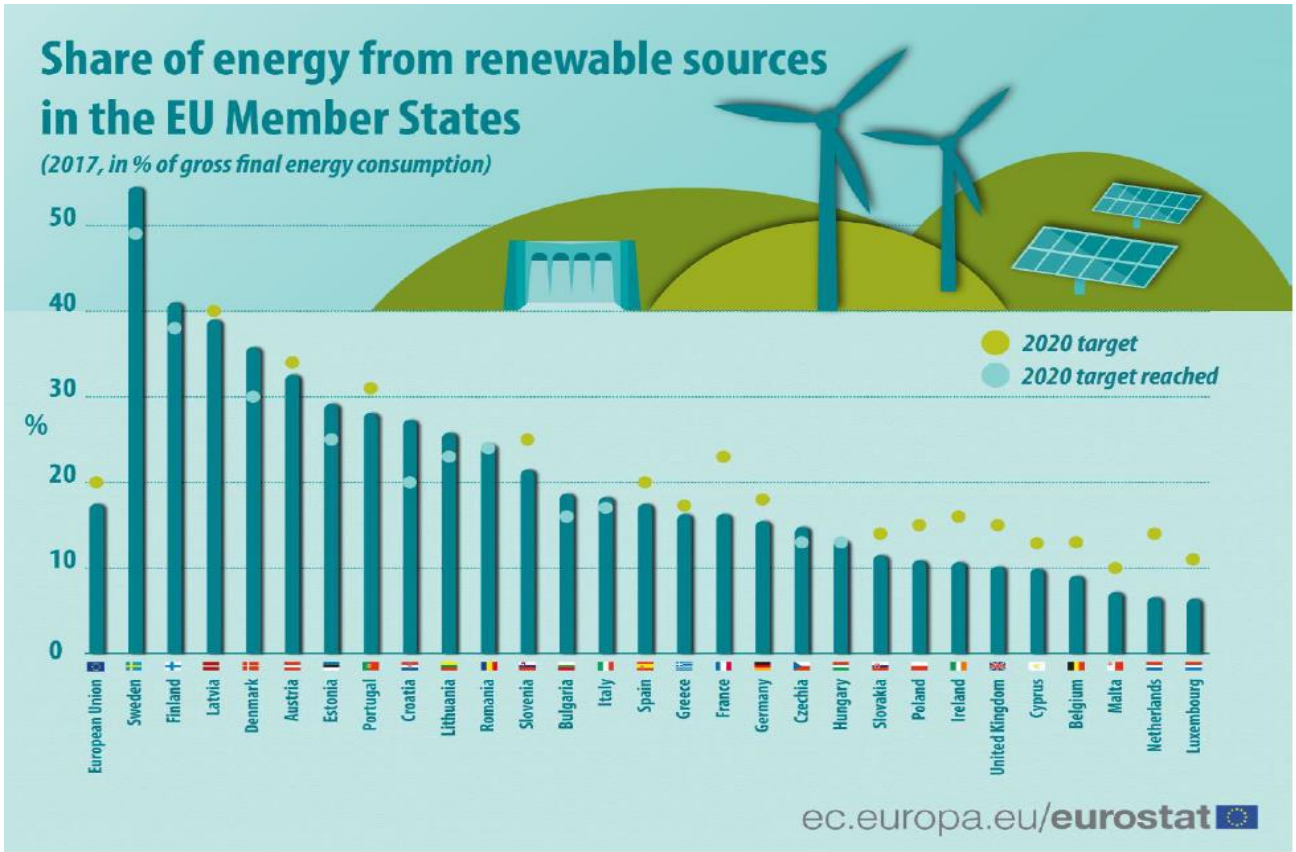
Regulation (EU) 2018/1999 on the Governance of the Energy Union and Climate Action was prepared under the same legislative package "*Clean Energy for All Europeans*", regarding the need for an integrated energy and climate changes strategic planning by 2030 in each Member State for **the five main dimensions**:**energy security, decarbonisation, energy efficiency, the internal energy market and research, innovation and competitiveness.** In this respect, the Romanian authorities prepared and submitted to the European Commission, at the end of 2018, *the draft Integrated Energy and Climate Changes National Plan for 2021-2030 (IECCNP),* being established in its final form after the discussions with the European Commission held by 31 December 2019.

The energy transition will entail a change from a European energy system based on the use of fossil fuels to a low-carbon alternative , where energy will be produced from renewable energy sources. Moreover, energy efficiency has multiple benefits and is a central pillar of the economy, which requires making the best of these benefits through regional cooperation and the implementation of policies to replace, at European level, the energetically ineffective equipment with highly efficient one.

In this context, **energy consumers** have a crucial role in supporting energy transition, as regards the innovative solutions designed to obtain energy from renewable sources and energy savings, by **participating in the energy transition** through sustained information on the opportunities to improve both the quality of life and the environment, and the sustainable economic growth.

2. Romania has recorded good performances on energy from renewable sources and energy efficiency, the 24 % target for energy from renewable sources for 2020 being already exceeded, considering that in 2017, according to Eurostat, the rate was 24.5 %.

Figure 33



Annex C to **the European Commission's Country Report SWD (2019) 1022 final of 27 February 2019 for Romania** reviews the Europa 2020 Strategy indicators and the 2012-2017 energy indicators are listed in the table below on *Green growth*.

Table 30

Tabelul C.6: **Creșterea verde**

Performanța creșterii verzi		2012	2013	2014	2015	2016	2017
La nivel macroeconomic							
Intensitatea energetică	kgep / €	0,27	0,24	0,23	0,22	0,21	0,21
Intensitatea emisiilor de CO_2	kg / €	0,96	0,85	0,83	0,80	0,74	-
Intensitatea resurselor (reciproca productivității resurselor)	kg / €	3,35	3,26	3,23	3,71	3,43	3,02
Intensitatea deșeurilor	kg / €	1,91	-	1,26	-	1,17	-
Balanța comercială energetică	% din PIB	-3,05	-1,90	-1,41	-0,91	-0,94	-1,31
Ponderea energiei în IAPC	%	12,5	12,4	12,2	12,3	11,9	12,4
Diferența dintre variația prețului la energie și inflație	%	1,3	5,0	0,1	2,8	-1,0	1,6
Costul unitar real al energiei	% din valoarea adăugată	29,5	27,6	26,5	26,6	26,7	-
Raportul dintre taxele de mediu și impozitele salariale	raport	0,18	0,19	0,22	0,24	0,23	-
Taxe de mediu	% din PIB	2,0	2,0	2,3	2,4	2,3	1,9
La nivel sectorial							
Intensitatea energetică a industriei	kgep / €	0,16	0,15	0,14	0,14	0,13	0,12
Costul unitar real al energiei pentru industria prelucrătoare, cu excepția rafinării	% din valoarea adăugată	21,5	21,2	20,6	20,4	20,3	-
Ponderea industriilor energointensive în economie	% din PIB	11,6	11,4	12,0	12,3	12,4	12,4
Prețurile energiei electrice pentru utilizatorii industriali medii	€ / kWh	0,08	0,09	0,08	0,08	0,08	0,08
Prețurile gazelor naturale pentru utilizatorii industriali medii	€ / kWh	0,03	0,03	0,03	0,03	0,03	0,03
Cheltuielile publice cu C-D pentru energie	% din PIB	0,01	0,01	0,02	0,01	0,02	0,01
Cheltuielile publice cu C-D pentru protecția mediului	% din PIB	0,02	0,02	0,01	0,01	0,01	0,01
Rata de reciclare a deșeurilor municipale	%	14,8	13,2	13,1	13,2	13,3	13,9
Ponderea emisiilor de GES care fac obiectul ETS*	%	44,6	38,0	38,2	37,7	35,2	-
Intensitatea energetică a transporturilor	kgep / €	0,60	0,54	0,53	0,48	0,43	0,42
Intensitatea emisiilor de CO_2 în sectorul transporturilor	kg / €	1,68	1,53	1,52	1,35	1,21	-
Siguranța alimentării cu energie							
Dependența de importurile de energie	%	22,3	18,1	16,4	16,4	21,6	23,1
Indicele agregat al concentrării furnizorilor	HHI	12,4	12,8	14,2	17,8	19,9	-
Diversificarea mixului energetic	HHI	0,23	0,23	0,23	0,23	0,23	0,23

Table C.6: **Green growth**

Green growth performance		2012	2013	2014	2015	2016	2017
Macroeconomic							
Energy intensity	kgoe/€	0.27	0.24	0.23	0.22	0.21	0.21
Carbon intensity		0.96	0.85	0.83	0.80	0.74	-
Resource intensity (reciprocal of resource productivity)	Kg/€	3.35	3.26	3.23	3.71	3.43	3.02
Waste intensity	Kg/€	1.91	-	1.26	-	1.17	-
Energy balance of trade	% GDP	-3.05	-1.90	-1.41	-0.91	-0.94	-1.31
Weighting of energy in HICP	%	12.5	12.4	12.2	12.3	11.9	12.4

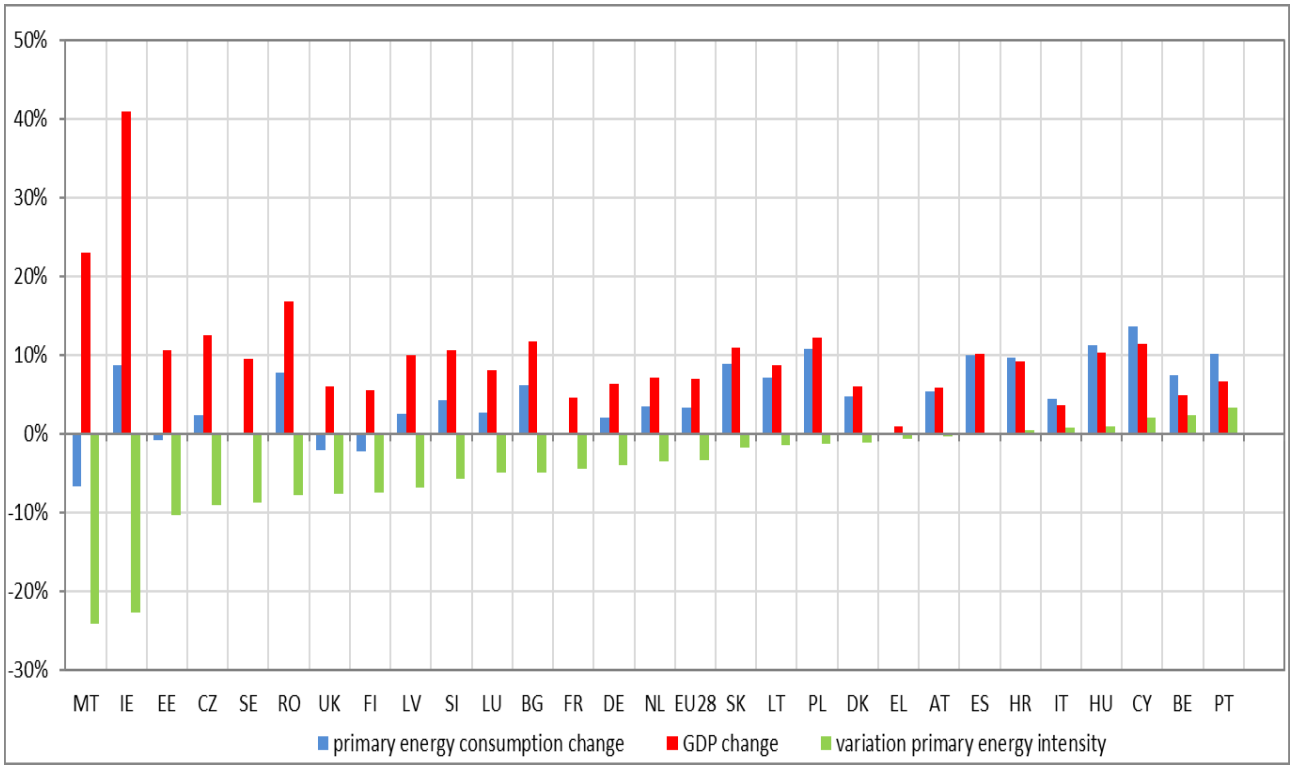
Difference between energy price change and inflation	%	1.3	5.0	0.1	2.8	-1.0	1.6
Real unit of energy cost	% of the added value	29.5	27.6	26.5	26.6	26.7	-
Ratio of environmental taxes to labour taxes	ratio	0.18	0.19	0.22	0.24	0.23	-
Environmental taxes	% GDP	2.0	2.0	2.3	2.4	2.3	1.9
Sectoral							
Industry energy intensity	kgoe/€	0.16	0.15	0.14	0.14	0.13	0.12
Real unit energy cost for manufacturing industry excl. refining	% of the added value	21.5	21.2	20.6	20.4	20.3	-
Share of energy-intensive industries in the economy	% GDP	11.6	11.4	12.0	12.3	12.4	12.4
Electricity prices for medium-sized industrial users	€/kWk	0.08	0.09	0.08	0.08	0.08	0.08
Gas prices for medium-sized industrial users	€/kWk	0.03	0.03	0.03	0.03	0.03	0.03
Public R&D for energy	% GDP	0.01	0.01	0.02	0.01	0.02	0.01
Public R&D for environmental protection	% GDP	0.02	0.02	0.01	0.01	0.01	0.01
Municipal waste recycling rate	%	14.8	13.2	13.1	13.2	13.3	13.9
Share of GHG emissions covered by ETS*	%	44.6	38.0	38.2	37.7	35.2	-
Transport energy intensity	kgoe/€	0.60	0.54	0.53	0.48	0.43	0.42
Transport carbon intensity	kg/€	1.68	1.53	1.2	1.35	1.21	-
Security of energy supply							
Energy import dependency	%	22.3	18.1	16.4	16.4	21.6	23.1
Aggregated supplier concentration index	HH1	12.4	12.8	14.2	17.8	19.9	-
Diversification of energy mix	HH1	0.23	0.23	0.23	0.23	0.23	0.23

Source: The European Commission's Country Report SWD (2019) 1022 final of 27 February 2019 for Romania

3. According to the *European Commission's Fourth Report on the State of the Energy Union, which includes the 2018 assessment of the progress made by Member States towards the national energy efficiency targets for 2020 and towards the implementation of the Energy Efficiency Directive as required by Article 24(3) of the Energy Efficiency Directive 2012/27/EU,* in 2017 primary energy consumption increased in 20 Member States compared to the previous year, including in Romania.

https://ec.europa.eu/transparency/regdoc/rep/1/2019/RO/COM-2019-224-F1-RO-MAIN-PART-1.PDF

Figure 34.
Relative changes in primary energy consumption, primary energy intensity and GDP, 2014-2017 (Source: 9.4.2019 COM(2019) 224 final)



Source: Eurostat

In order to better understand the factors underlying the recent increases in energy consumption, the European Commission prepared a report which presents the trends in the recent tendencies on energy consumption.
https://ec.europa.eu/energy/sites/ener/files/report_of_the_work_of_task_force_mobilising_efforts_to_reach_eu_ee_targets_for_2020.pdf

The assessment showed that there are several causes for the increase in primary and final energy consumptions after 2014, such as: economic growth starting in 2014, the low prices in oil and the cold winters in 2015 and 2016, although the effects are different in the energy sectors.

The assessment of the potential factors which influenced the increase in the consumption trends in the years after 2014 indicates the existence of differences between sectors: the main increase in energy consumption was observed in buildings (residential and services) despite a slightly falling trend in 2017, followed by transport, whereas energy consumption in the industry recorded a very small increase.

Table 31.
Overview of indicators (Source: 9.4.2019 COM(2019) 224 final)

MS	Trend to reach the 2020 target		Short-term trend		Energy Intensity whole economy	Industry	Residential	
	PEC 2005-2017 trend compared to PEC 2005-2020 trend to reach the 2020 target	FEC 2005-2017 trend compared to FEC 2005-2020 trend to reach the 2020 target	Change of PEC 2017 compared to PEC 2016 [%]	Change of FEC 2017 compared to FEC 2016 [%]	2005-2017 average annual change of PEC energy intensity [%]	2005-2017 average change of FEC energy intensity in industry [%]	2005-2016 average annual change of FEC in residential per capita with climatic corrections [%]	2005-2016 average annual change of FEC in residential per dwelling with climatic corrections [%]
EU28	-	-	0,9%	1,2%	-2,0%	-2,0%	-0,5%	-1,2%
BE	-	-	-0,3%	-1,2%	-1,7%	-0,7%	-2,4%	-1,6%
BG	-	-	3,7%	2,5%	-2,8%	-5,2%	2,3%	0,4%
CZ	+	+	0,1%	2,7%	-3,0%	-4,6%	1,1%	0,0%
DK	-	+	2,1%	1,3%	-1,8%	-1,8%	0,1%	-0,5%
DE	-	-	0,2%	0,9%	-2,0%	-1,6%	-0,4%	-0,8%
EE	+	-	-4,2%	1,3%	-1,5%	-6,0%	1,2%	0,0%
IE	-	+	-1,4%	1,5%	-4,2%	-5,0%	-2,6%	-3,1%
EL	+	+	1,2%	0,3%	-0,2%	1,8%	-0,5%	-0,9%
ES	-	+	5,4%	2,3%	-1,5%	-2,4%	1,2%	-1,2%
FR	-	-	-0,3%	0,2%	-1,7%	-1,4%	-0,6%	-1,8%
HR	+	+	3,5%	4,3%	-1,4%	-1,6%	0,4%	-0,9%
IT	+	+	0,7%	-0,6%	-1,3%	-2,7%	1,0%	-0,3%
CY	-	+	4,4%	5,6%	-1,1%	0,7%	2,0%	-1,9%
LV	+	+	4,0%	5,1%	-2,1%	1,4%	-0,6%	-1,5%
LT	+	-	2,0%	5,1%	-5,0%	-2,0%	1,7%	-0,8%
LU	+	+	3,5%	3,6%	-3,0%	-1,0%	-2,1%	-3,8%
HU	+	-	3,1%	3,9%	-1,6%	2,0%	0,2%	-0,3%
MT	+	-	12,9%	6,8%	-4,5%	0,0%	13,4%	0,0%
NL	-	+	-0,4%	0,9%	-2,1%	-1,3%	-1,1%	-1,8%
AT	-	-	2,7%	2,1%	-1,1%	-0,3%	1,1%	0,4%
PL	-	-	4,5%	7,0%	-2,7%	-3,8%	1,0%	-0,5%
PT	+	+	4,7%	2,3%	-0,7%	-1,1%	-0,2%	-1,7%
RO	+	+	5,7%	4,4%	-4,3%	-5,9%	1,1%	-0,8%
SI	+	+	1,5%	-0,3%	-1,9%	-3,1%	0,9%	0,1%
SK	+	-	5,1%	7,2%	-3,9%	-4,9%	-1,0%	-1,8%
FI	+	+	-1,2%	0,1%	-1,9%	-0,5%	0,0%	-0,7%
SE	-	-	-1,6%	0,6%	-2,6%	-1,1%	-0,5%	-1,0%
UK	+	+	-1,6%	-0,8%	-3,1%	-2,5%	-2,2%	-2,2%
Source and extraction data	Eurostat 01/2019	Eurostat 01/2019	Eurostat 01/2019	Eurostat 01/2019	Eurostat 01/2019	Eurostat 01/2019	JRC & Eurostat 08/2018	Odyssee 11/2018

As regards **energy intensity**, almost all the Member States managed to improve their industry performances in the period 2005-2017 and **Romania is one of the countries which recorded the most significant improvements (over 50 %).**

As regards the progress recorded under Article 7 of the EED (the energy savings requirement), **Romania is among the Member States heading the right direction or which achieved more energy savings than necessary for the period 2014-2016.**

4. Energy management for 2017 was provided to final energy consumers with annual consumption of energy resources above 1 000 toe by 441 energy managers attested by ANRE, 20 authorised natural persons (PFA) and 71 companies providing energy services authorised by ANRE.

It is noticeable that the number of energy manager certificates dropped to 413 at the end of 2018 because of an absence of applications to extend the validity of certificates.

The coverage rate of certified and authorised energy management is 95.3 %. This energy management has the following structure:

- with own energy managers certified by ANRE - 384 consumers (50 %)
- with authorised natural persons (PFA) and energy service companies - 348 consumers (45.3 %)
- without certified energy management - 36 consumers (4.7 %).

5. At the end of 2018, the statement of energy efficiency certificates/authorisations was the following:

- 413 energy manager certificates
- 176 authorisations for energy auditors as natural persons
- 60 authorisations for energy auditors as legal persons, of which 12 energy auditors as PFA
- 68 approved energy service companies (of which 19 PFAs).

6. The Ministry of Regional Development and Public Administration published, as from 7 November 2018, the "Inventory of heated and/or cooled buildings with useful areas ranging between 250 m^2 and 500 m^2 held and occupied by the central public administration" and the "Inventory of heated and/or cooled buildings with useful areas of over 500 m^2 held and occupied by the central public administration" at the following link: http://mdrap.ro/constructii/metodologia-de-calcul-al-performantei-energetice-a-cladirilor, including information received from authorities.

The updating and supplementation of the information contained in the two inventories entails collecting information, under Article 6(1) of Law No 121/2014 on energy efficiency, from a large number of central public administration authorities - ministries, specialised bodies subordinated to the Government and ministries, autonomous administrative authorities. The two inventories were updated on **31 January 2019**.

7. ANRE, through its Energy Efficiency Department, promotes constructive dialogue with all the stakeholders in order to achieve the national targets on the increase of energy efficiency and, in the context of the approved **Government Decision No 203/2019 published in Official Gazette Nos 273 and 273 bis/10 April 2019 approving *the National Energy Efficiency Action Plan - NEEAP IV*,** sustained measures are required to promote and finance energy savings from the institutions involved in the implementation of Law No 121/2014 on energy efficiency, with all its subsequent amendments and supplements.