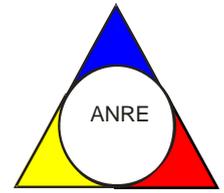




NATIONAL ENERGY REGULATORY AUTHORITY
ENERGY EFFICIENCY DEPARTMENT



REPORT

**ON THE PROGRESS REGISTERED IN ACHIEVING THE NATIONAL
TARGETS FOR ENERGY EFFICIENCY**

APRIL 2015

1. Introduction

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

The act establishes that the improvement of energy efficiency is a strategic goal of the national energy policy due to its major contribution to achieving the security of energy supply, sustainable development and competitiveness, saving of primary energy resources, and reducing greenhouse gas emissions.

Policy measures relating to energy efficiency apply to the entire chain: primary resources, production, distribution, supply, transport and final consumption of energy.

A national indicative target is set for reducing energy consumption by 19% by the year 2020.

The provisions of **Article 19(1) of Act No 121/2014 on energy efficiency** establish the obligation of updating the **National Energy Efficiency Action Plan**. This plan (**PNAEE 2014–2020**) was approved by **Government Decision No 122/2015**.

The plan includes the general framework of national energy efficiency action plans, and follows the structure of the **Template** including the mandatory elements, as approved by the Commission Implementing Decision of 22 May 2013.

In accordance with the provisions of **Act No 121/2014 on energy efficiency**, the **Energy Efficiency Department** was established within the **National Energy Regulatory Authority** by **Order No 95/2014 of the President of the National Energy Regulatory Authority (ANRE)**, published in the **Official Gazette of Romania No 737/2014**.

The main duties and responsibilities of the **Energy Efficiency Department**, as laid down in the provisions of **Article 3(2) of Act No 121/2014 on energy efficiency**, include the following:

- a) draft policy proposals and secondary legislation on energy efficiency;
- b) monitor the implementation of the **National Energy Efficiency Action Plan and of the programmes for increasing energy efficiency at national level for the period 2014–2020**, as well as of the energy savings resulting from the provision of energy services and other energy efficiency improvement measures;
- c) ensure the surveillance of the equipment and appliance market for which there are specific regulations in place on energy efficiency and eco-design;

d) submit a report to the Government in order to notify the European Commission on the progress registered in achieving the national targets for energy efficiency, drawn up according to Annex No 11, Part 1, by no later than 30 April of each year, starting with 2015;

e) authorise energy auditors from the industry and certify energy managers.

In accordance with the provisions of **Article 3(2) point (e) of Act No 121/2014 on energy efficiency**, the **Energy Efficiency Department** operating within ANRE has the following responsibility:

“submit a report to the Government in order to notify the European Commission on the progress registered in achieving the national targets for energy efficiency, drawn up according to Annex No 11, Part 1, by no later than 30 April of each year, starting with 2015”.

The provisions of Annex No 11 of the Act: General framework for reporting, Part I: The general framework for annual reporting is presented in Annex 1.

This annual report is the first report to be prepared in accordance with the law and includes the information requested in Annex 11, Part I, point (a) of **Act No 121/2014 on energy efficiency**.

It should be clarified that **Article 3(2) point (e) and Annex 11 of Act No 121/2014 on energy efficiency** transpose into Romanian legislation the provisions of Article 24(1) and of Annex 14 of Directive 27/2012/EU.

Recently, ANRE has received information from the European Commission concerning the method of preparing the annual reports. Furthermore, meetings were also held at European level within the project entitled “**Concerted Action – Energy Efficiency Directive**”, which is an event that involves the participation of the competent authorities from EU Member States. During these meetings, the representatives of the Directorate-General for Energy made some clarifications regarding the elaboration of the annual reports.

Inter alia, the definitions and the methodology for the calculation of the specific indicators of the reports were presented. These indicators are not entirely present in the statistical reports of the authorised institutions (INS – National Institute of Statistics at national level, and EUROSTAT at European level). Moreover, further clarifications were made concerning the significance of some indicators for which multiple interpretations were possible. This report has been elaborated in accordance with the information and clarification received.

ANRE is part of the EED Committee in Brussels operating under DG Energy, Unit C3 Energy Efficiency, which has the mission to assist the European Commission by adopting measures for the implementation of Directive 2012/27/EU, and to offer support in the analysis and assessment thereof. This Committee serves as a forum for the exchange of information and best practices at EU level in order to prepare staff working documents, which explain the key provisions of Directive 2012/27/UE.

In the letter sent to the **Energy Efficiency Department** operating within ANRE, DG ENER of the European Commission requested the inclusion of further indicators in the annual reporting, which are not specified in **Annex No 14, Part I, point (a)**,

stating that the inclusion is voluntary. This request has been taken into consideration as much as possible.

In order to enable the aggregation of the results and carry out comparisons, the representatives of DG ENER of the European Commission recommended all Member States to use the EUROSTAT database as a source of primary information in order to ensure that all reports have a unified nature.

Under these circumstances, the primary information from the EUROSTAT database and from <http://www.worldenergy.org/data/efficiency-indicators/> was regularly used for the elaboration of the Report.

2. Indicators according to Annex No 11, Part I, point (a) of Act No 121/2014

In accordance with **Annex No 11, Part I of Act No 121/2014 on energy efficiency**, the annual reports serve as a basis for monitoring the progress towards national targets for 2020. These shall include, as minimum information, an estimate of multiple indicators (as specified by the law) for the year before last (year X (1) – 2); these indicators are listed in the law. Furthermore, it is also laid down that in sectors where energy consumption remains stable or is growing, Member States shall analyse the reasons for it and attach their appraisal to the estimates.

Table 1 includes the values registered in the year 2013 according to the indicators referred to in Annex XI, Part I, point (a) of the law. In order to be able to make comparisons and identify trends, values from the period 2010–2012 were also included.

The name of indicators and the order in which they are presented corresponds with the name and order provided in **Annex 11, Part I, point (a)** of the law

Table 1

Order No	Indicator	unit of measure	2013	2012	2011	2010
1	Total primary energy consumption	thousand toe	30 889	33 644	34 830	34 328
2	Total final energy consumption, of which:	thousand toe	21 758	22 801	22 771	22 593
2.1	industry	thousand toe	6 310	6 787	7 105	6 880
2.2	transport	thousand toe	5 278	5 448	5 349	5 124
2.3	households	thousand toe	7 722	8 061	7 860	8 102
2.4	services	thousand toe	1 785	1 763	1 774	1 880
2.5	agriculture and forestry	thousand toe	457	498	434	392
3	Gross value added, of which	million Euros 2005	86 709.1	83 440.0	83 083.6	82 727.8
3.1	industry	million Euros 2005	30 924.3	29 691.4	31 431.6	33 229.3
3.2	services	million Euros 2005	48 402.5	48 461.2	42 337.4	41 980.7

4	Total disposable income of households		million Euros	109 877.9	104 422.5	103 619.5	100 570.8
5	gross domestic product (GDP)	in prices from 2005	million Euros 2005	96 655	93 364	92 848	90 735
		in current prices	million Euros	142 245	131 579	131 478	124 328
		at purchasing power parity	million Euros PPP	289 224	280 905	267 932	256 051
6	Electricity generation from conventional thermal power plants	thousand toe	3 322.5	3 788.5	3 945.1	3 476.4	
		TWh	38.6	44.0	45.8	40.4	
7	Electricity generation from cogeneration plants	thousand toe	1 029.8	1 245.3	1 288	1 099.8	
		TWh	12.0	14.5	15.0	12.8	
8	Heat generation from conventional thermal power plants	thousand toe	2 025.4	2 133.8	2 361.1	2 366.9	
9	Heat generation from cogeneration plants, including industrial residual heat	thousand toe	1 648.1	1 729.5	1 928.6	1 880.1	
10	Fuel input for conventional thermal power plants	thousand toe	10 943.1	12 798.1	13 677	12 115.2	
11	Total passenger kilometres (pkm) EUROSTAT table	million passenger s-km	21 464	21 451	20 592	17 392	
12	Total tonne kilometres	million tonnes-km	59 209	55 654	52 477	52 581	
13	Total population	inhabitants	20 020 074	20 095 996	20 199 059	20 294 683	
14	Losses from the transmission and distribution of energy	thousand toe	1 116.7	1 335.0	1 363.0	1 425.1	
15	Heat generation from thermal plants for centralised heat distribution	thousand toe	477.5	404.4	432.6	487.0	
16	Fuel input for thermal plants for centralised heat distribution	thousand toe	572.7	459.2	611.9	688.7	

In order to provide a more complete view of the efforts made concerning the increase of energy efficiency at national level and of the results achieved, the values of other energy indicators at macroeconomic level were also calculated (intensity of primary energy consumption, intensity of final energy consumption, etc.). The values of these indicators are presented in **Table 2** below.

Table 2

Order No	Indicator	Unit of measure	2013	2012	2011	2010
1	GDP calculated in Euros 2005	toe/1000 Euros 2005	0.335	0.379	0.394	0.395
	GDP calculated in Euro	toe/1000 Euro	0.227	0.269	0.278	0.288
	GDP calculated in Euros at the purchasing power	toe/1000 Euros ppp	0.112	0.126	0.136	0.140

		parity					
2	Intensity of final energy consumption	GDP calculated in Euros 2005	toe/1000 Euros 2005	0.225	0.244	0.245	0.249
		GDP calculated in Euro	toe/1000 Euro	0.153	0.173	0.173	0.182
		GDP calculated in Euros at the purchasing power parity	toe/1000 Euros ppp	0.075	0.081	0.085	0.088
3	The ratio of primary energy and final energy consumption		–	1.42	1.48	1.53	1.52
4	Primary energy consumption per inhabitant		toe/inh	1.543	1.674	1.724	1.691
5	Final energy consumption per inhabitant		toe/inh	1.087	1.135	1.127	1.113
6	Final energy consumption of households per inhabitant		toe/inh	0.386	0.401	0.389	0.399

3. Romania's place in Europe in terms of energy efficiency

The analysis of the development of the main macroeconomic indicators of energy consumption reveals that primary energy consumption per inhabitant decreased to the value of 1.543 toe in 2013, following the average annual increase of approximately 1.68% between 2000 and 2008, reaching the value of 1.931 toe. These values are well below the EU-27 average (3.375 toe/inhabitant in 2011).

The development of the intensity of primary and final energy consumption during the time of the crisis and economic recovery does not allow for a convincing conclusion regarding the increase of energy efficiency in accordance with the second National Energy Efficiency Action Plan. According to Eurostat data, the average intensity of primary energy consumption for the 27 Member States of the European Union was 0.152 toe/1 000 Euros in 2010.

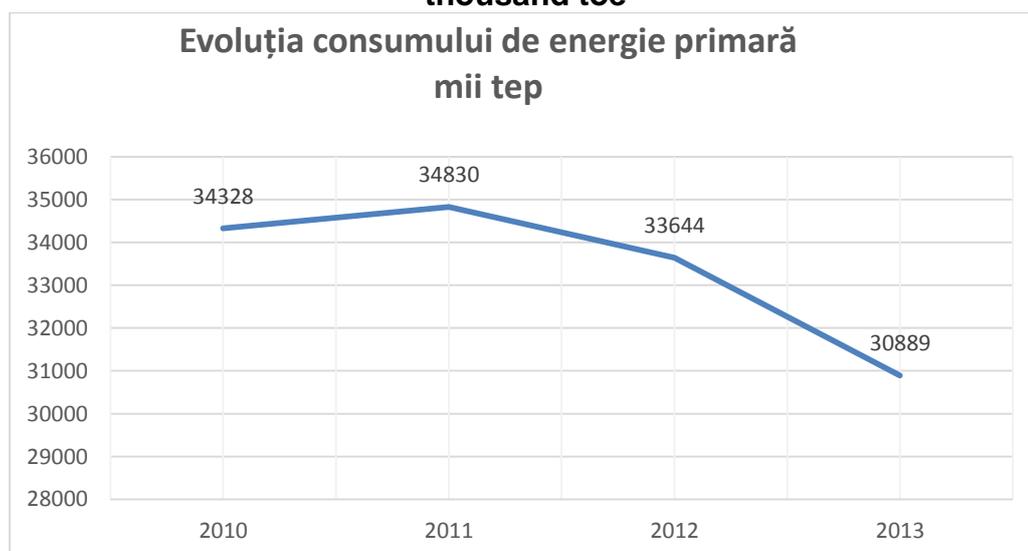
The energy intensity of the Romanian industry decreased by approximately 42% between 2007 and 2012, both as a result of the measures taken for the increase of energy efficiency and as a result of the restructuring that took place during the crisis.

Taking into consideration that the energy intensity of the Romanian industry remains slightly higher than the EU average, it is appropriate to continue the policies and measures for increasing energy efficiency in order to ensure sustainable development.

The main observations and comments with regards to the values of these indicators are as follows:

- a) Primary energy consumption constitutes a fundamental indicator in monitoring the progress made by the EU as a whole and by each Member State in achieving the goals set out by the directive. This indicator is defined as the difference between the gross primary energy consumption and the non-energy consumption of all energy carriers (for example, natural gas used as a raw material in the chemical industry). The values from **table 1**, line 1 have been calculated according to this definition.

Figure 1
Evolution of primary energy consumption
thousand toe

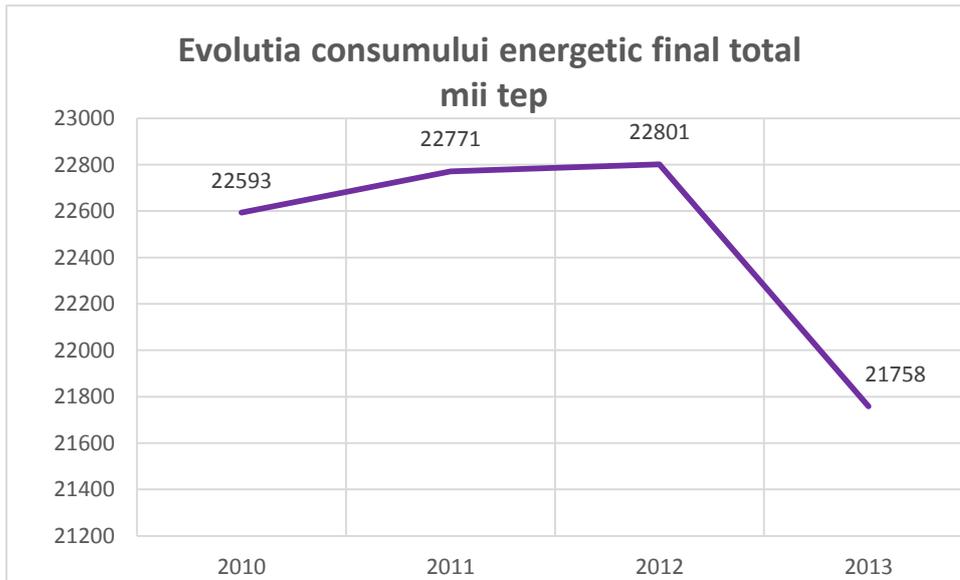


In 2013, primary energy consumption fell by **2 755 thousand toe** compared to the previous year, namely by 8.2%, whereas the GDP rose by **3.4%** in real terms. The decrease is quite significant and in our opinion, requires a special analysis (although the law prescribes the necessity of analyses only in situations where the energy consumption increased or remained constant) – **Figure 1**.

A primary cause (important and positive) is the decrease of final energy consumption by **1 043 thousand toe**, namely by 4.6%, whereas the GDP increased.

This reflects an increase in energy efficiency in the final consumption sectors, achieved both through measures for the restructuring of economy, and through the implementation of energy efficiency programmes. The decrease of final energy consumption resulted in a reduction by **1 481 thousand toe** of primary energy consumption.

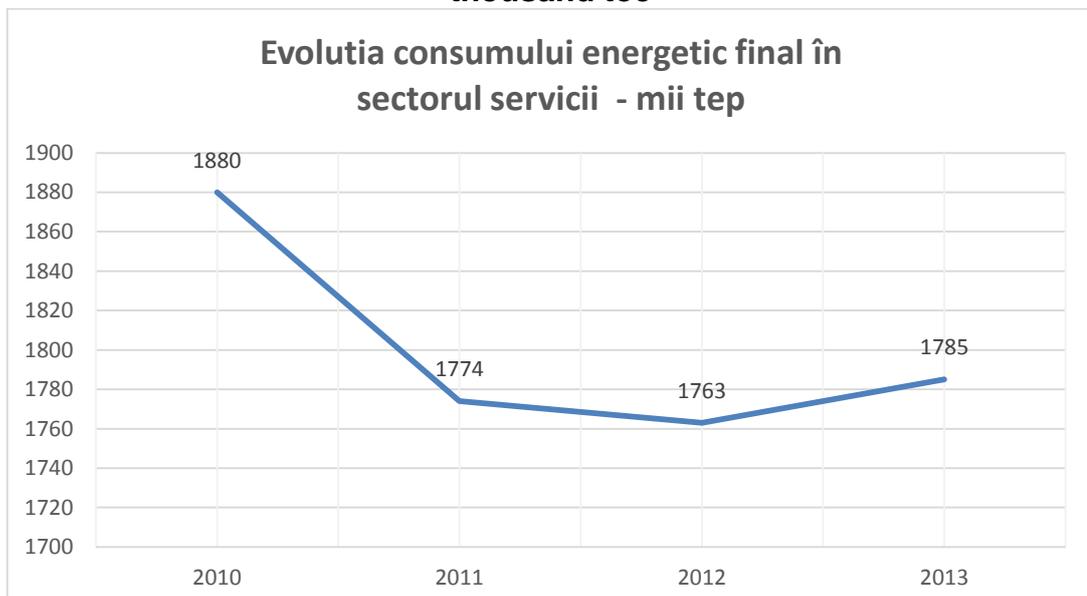
Figure 2
Evolution of the overall final energy consumption
thousand toe



A second cause (which is also important and positive) is the decrease of the primary energy input for producing one unit of final energy (**Table 2, line 3**). This indicator characterises the efficiency of the energy sector as a whole (extraction of energy products, electricity and heat production, refining, manufacture of coke, transport and distribution of energy, etc.), and is frequently used at international level. Its decrease in 2013 compared to 2012 means an increase in the efficiency of the energy sector as a whole.

- a) Between 2012 and 2013, at sector level, the final energy consumption increased only in the “**services**” sector – **Figure 3**, although this sector had a higher pace of development than the overall national economy. In all other sectors (including the household sector), the final energy consumption decreased. Furthermore, the final energy consumption at national level also fell.

Figure 3
**Evolution of the final energy consumption in the services sector
thousand toe**



- b) For the “**total disposable income of households**”, indicator, the EUROSTAT section indicated in the recommendations of the European Commission, no values were found for Romania for the years 2012 and 2013. The values in **Table 1**, line 4 are values from the Statistical Yearbook of the INS corresponding with the indicator “actual final consumption”, defined as follows:

The actual individual final energy consumption of national households includes:

expenditure of national households for purchasing goods and services in order to satisfy the needs of their members, individual consumption expenditure of public administrations (products, medical devices and equipment, outpatient services, hospital services, public health services, recreational and sporting services, cultural services, education, family and children, unemployment, dwellings, social exclusion) and the individual expenditure of households and non-profit institutions serving households.

Figure 4
Evolution of the total disposable income of households
million euros



- c) The gross domestic product (GDP) is expressed in Euro in a first stage, depending on its value in the national currency and on its parity against Euro. Certain corrections are carried out frequently, the most common of which are as follows:

- elimination of the influence of price changes on the internal market (calculated in Euros) against a certain year chosen as reference year (2005) with GDP expressed in Euros in 2005,
- introduction of the influence of the purchasing power of the population and of the use of the purchasing power parity (PPC) between the national currency and Euros with GDP expressed in Euros PPC.

For developed countries, the carrying out of these corrections has a relatively reduced influence on the final result. Thus, for the EU-28 as a whole, the percentage point difference between GDP calculated in Euros PPC and in

Euros 2005 is 13%. For Romania, however, the GDP calculated in Euros 2005 is 2.82 times lower than GDP calculated in Euros PPC. This has an influence on the value of energy intensity indicators, as well as on the quality estimates and evaluations with regards to the level of energy efficiency in Romania.

The European Commission recommended the use of GDP values in Euros 2005, however, in order to create the possibility of an objective assessment, in **Table 1** are presented the GDP values both in „Euros 2005” and in the other two variants, which were all taken from the EUROSTAT database. The same approach was used in table 2 in the presentation of the energy efficiency indicators.

- a) The intensity of primary energy is witnessing a continuous and powerful decrease, which has been going on for over two years.

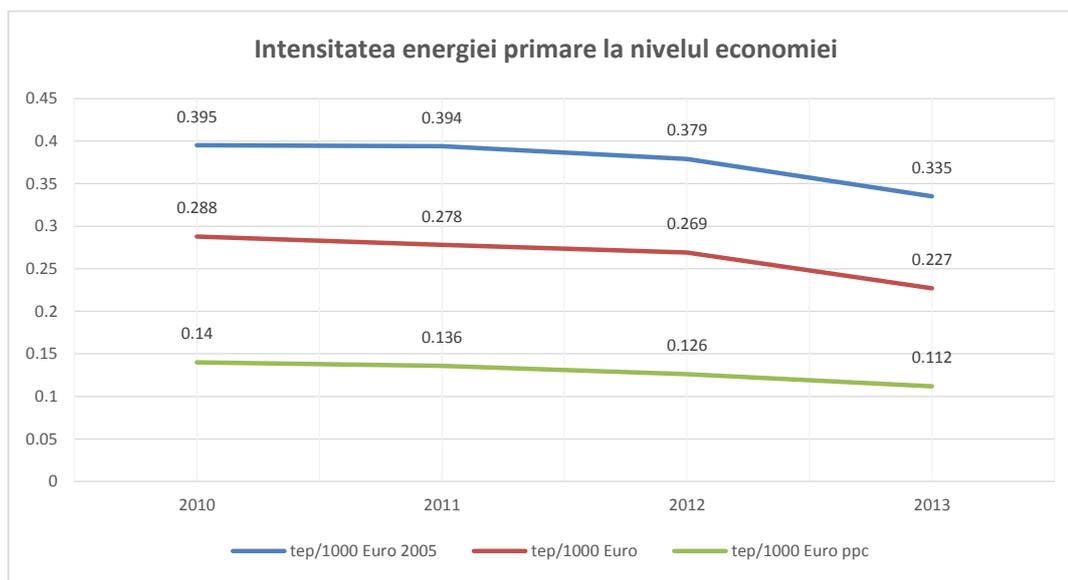
The value of this indicator, in the case of Romania, largely depends on the way GDP is expressed. This has an effect on the comparisons made with the current situation on international level. Thus:

- if the intensity of primary energy is calculated in **toe/thousand Euros 2005**, the value of this indicator in 2013 for Romania (**0.335 toe/ thousand Euros 2005**) is **2.36 times higher** than the EU-28 average (**0.142 toe/ thousand Euros 2005**).

- if the calculation of the GDP is done is current prices, the intensity of primary energy in Romania for the year 2013 (**0.227 toe/thousand Euros**) is **1.78 times higher** than the EU-28 average (**0.127 toe/thousand Euros**).

- if the calculation of the GDP is done is **toe/thousand Euros PPC**, then the intensity of primary energy in Romania (**0.112 toe/1000 Euros PPC**) is lower than the intensity of the EU-28 average (**0.123 toe/1000 Euros PPC**).

Figure 5



The intensity of primary energy at economic level

toe/thousand Euros 2005 toe/thousand Euros toe/thousand Euros ppc

On the other hand, we believe that it is essential that irrespective of the calculation method, namely the unit of measure used, the intensity of primary energy has a continuous decreasing tendency – see **Figure 5**. This tendency was present not only between 2010 and 2013, but it is obvious in the

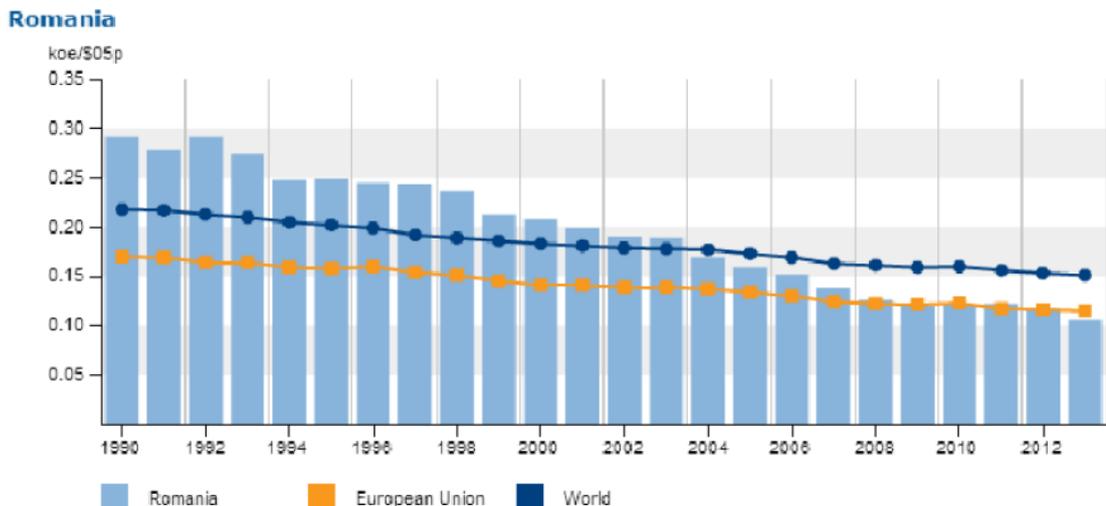
overall evolution after 1992. It is more pronounced after 1998, when Romania launched the process of integration into the European Union.

On the other hand, it shall also be taken into consideration that the intensity of energy intensity at the level of the national economy is first of all a macroeconomic parameter, which depends on the structure of the national economy and only secondarily is it a technical parameter characterising the intensities of energy use. Romania inherited from the period of centralised economy a powerfully intensive structure of economy, and implicitly, a very high intensity of primary energy. The permanent and significant decreases in the values of primary energy intensity were possible both by means of technical measures for improving the efficiency of energy use, and largely by means of structural economic measures. The difference from developed countries regarding economic structures, however, are yet to be completely eliminated.

In order to eliminate the influence of these structural differences, it is customary to calculate the intensity of primary energy with the structural correction of the economy. Such analysis was prepared by the World Energy Council within the framework of a series of studies conducted in collaboration with ADEME and ENERDATA. The intensity of primary and final energy intensity in Romania was (re)calculated taking into consideration an economic structure similar to the structure of the EU average and considering energy intensities by sectors at the level of actual sector values. The results are presented in **Figure 6** (the intensity of primary energy) and **Figure 7** (the intensity of final energy). Gross domestic product is calculated in USD 2005, while the intensity of primary energy and final energy, respectively, is calculated in kgep/USD 2005.

Figure 6
Intensity of primary energy adjusted to the economic structure of the EU

Intensitate energetica primara ajustata la structura economica UE



The analysis of the graphic reveals that the intensity of primary energy, corrected with the correction coefficient for economic structure, clearly shows that,

starting with 2008, Romania has almost the same value as the European Union average.

Figure 7
Intensity of final energy

Intensitate energetica finala

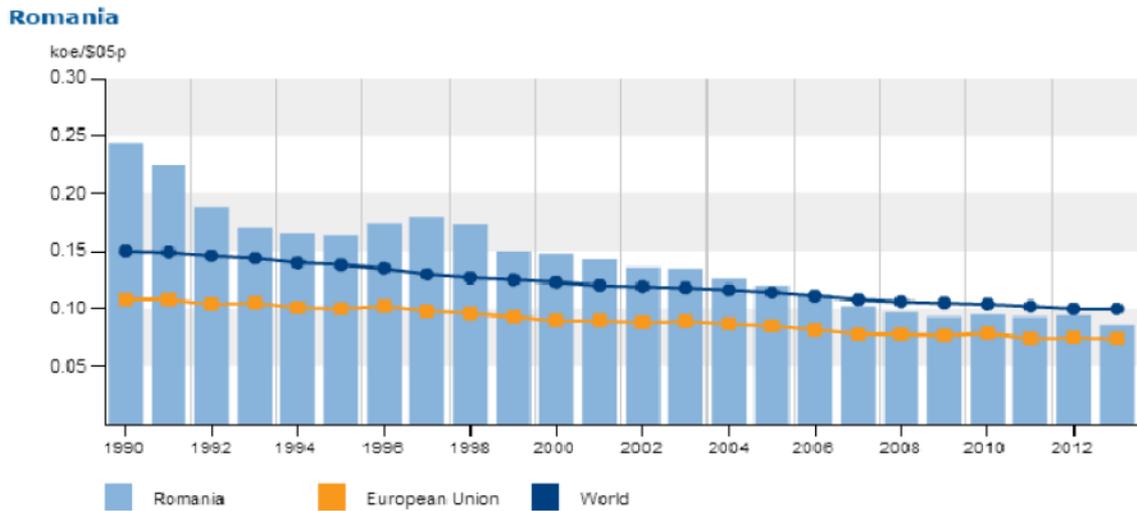


Figure 8
Intensity of final energy in relation to the structure of GDP 2005

Intensitate energetica finala raportata la structura PIB 2005

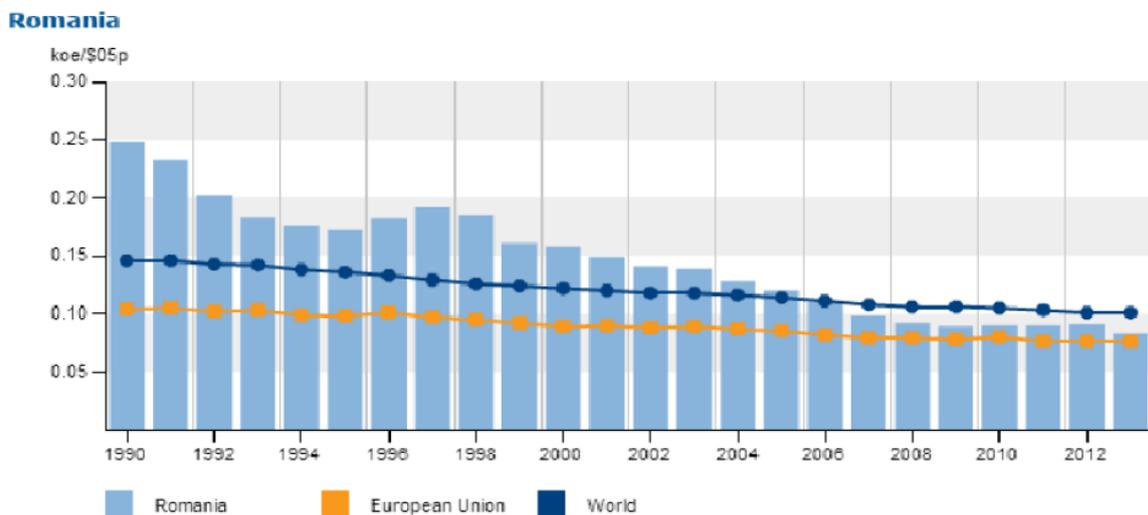
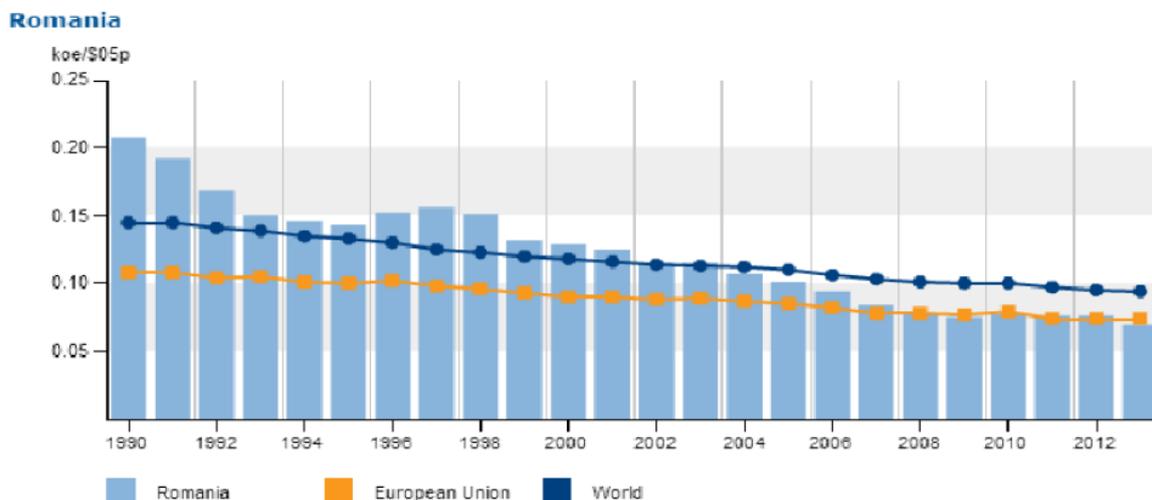


Figure 9
Intensity of final energy adjusted to the economic structure of the EU

Intensitate energetica finala ajustata la structura economica UE



The analysis of the above graphics reveals that the intensities of primary energy and those of final energy at national level, corrected with the correction coefficients for economic structure have almost the same value as the European Union average.

The restructuring process of the national economy has yet to be completed. It is to be expected that the intensity of primary energy and that of final energy (calculated in toe/1000 Euros 2005) in Romania shall approach the values registered by developed countries as the structure of the Romanian economy approaches that of the economy of these countries.

4. Buildings sector

Energy efficiency in residential buildings

Through the **National program to increase the energy performance of residential buildings**, funded pursuant to **Emergency Government Ordinance No 18/2009**, approved by **Act No. 158/2011**, as subsequently amended and supplemented, by 31 December 2014, energy efficiency works were carried out in **1 518 multi-family houses**, from different climate zones, involving **55 293 flats**. According to the normative act, in the multi-family houses included in the programme there were carried out intervention works mainly on the building envelope, so as to achieve the decrease of the annual energy consumption for heat generation: below 100 kWh/m². The evolution of the number of buildings by 31 December 2014, included in the above mentioned programme, is presented in **Figure 10** and **Figure 11**.

Tab. 3 – Evolution of the number of buildings

Period	Number of multi-family buildings completed	Number of flats completed
2009	291	8 984
2010	502	22 390
2011	521	18 878
2012	61	2 285
2013	75	2 184
2014	68	3 534
TOTAL	1 518	58 255

Figure 10

Evolution of the number of multi-family buildings completed

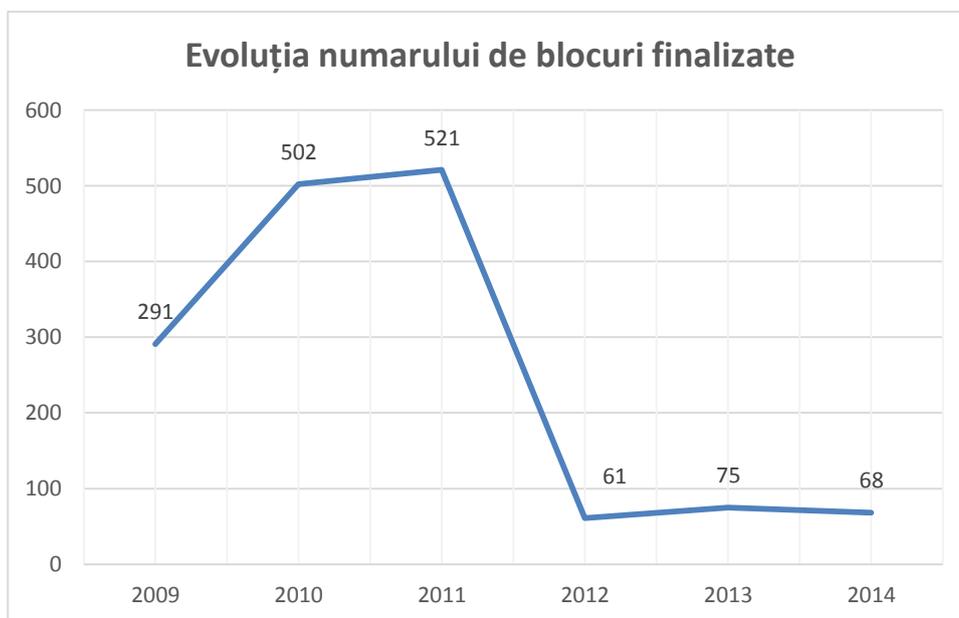
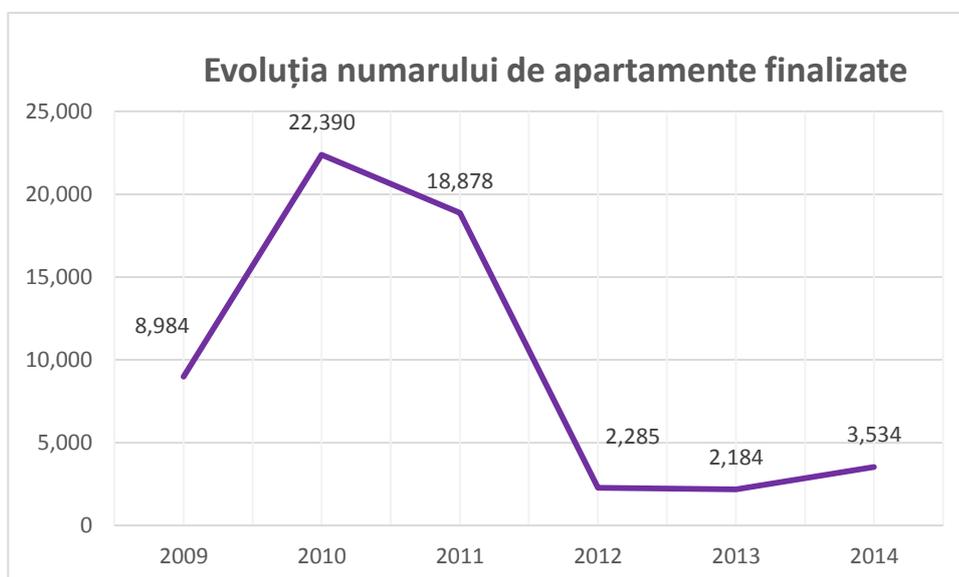


Figure 11

Evolution of the number of flats completed



Thus, the energy saving resulting from the residential buildings included in the national programme (approximately 35–40% of the final energy consumption prior to the renovation of the buildings) is:

Tab. 4 – Energy savings

Calculated energy saving	
Primary energy [kWh/year]	thousand toe
922 964 843	79.36

Within the framework of the local programmes funded pursuant to the provisions of Article II of Emergency Government Ordinance No 63/2012 amending and supplementing Emergency Government Ordinance No 18/2009 on the improvement of the energy efficiency of multi-family houses by 31 December 2014 there have been completed intervention works on the envelope of approximately 210 buildings, concerning 9626 flats, and the resulting energy saving calculated is as follows:

Tab. 5 – Energy savings

Calculated energy saving	
Primary energy [kWh/year]	thousand toe
34 688 254	2.98

Within the framework of the **Programme for the thermal rehabilitation of multi-family houses**, funded from the structural and cohesion funds of the European Union, in accordance with the rules and procedures for accessing these funds and in compliance with the conditions laid down by the procedural documents relating to the implementation of operational programmes, by 31 December 2014 a number of **108 contracts** for the improvement of energy efficiency were signed, which account for 680 multi-family houses and a total number of **31 427 flats**.

Energy efficiency in the buildings of the central public administration

In order to increase the energy efficiency of this building category, inventoried according to Order No 3466/2013 of the Ministry of Regional Development and Public Administration (MDRAP), published in the Official Gazette of Romania, Part I, No 778/2013, and by applying the provisions of Article 5(1) of 2012/27/EU on energy efficiency for the year 2014, the following information were sent by the relevant owners/administrators, in relation to the actions undertaken in 2014:

- made publicly available the inventory of buildings with an area of over 500 sqm, by publishing on the website of each owner/administrator, also including the corresponding relevant data on energy;
- there were initiated/completed, as appropriate:
 - technical expertise procedures of the building structures;
 - energy audits, including the preparation and display of the energy performance certification of the inventoried buildings;
 - energy efficiency plans with specific objectives and actions in terms of the major renovation/ thermal rehabilitation of the inventoried buildings, and the estimated energy saving based on calculations;
- the following energy efficiency improvement works were carried out in the buildings:
 - thermal insulation of the building envelope;
 - replacement of incandescent/fluorescent luminaire with energy-saving luminaires with high energy efficiency;
 - revision/repair of interior heating installations, including the replacement of central heating units with high-efficiency units, wherever it was possible.

The Regional Operational Programme 2014–2020, Priority Axis 3 – *Supporting the transition to a low carbon economy, Investment Priority 3.1. – Energy efficiency in public buildings, residential buildings and public lighting* will provide funds for investments for the improvement of energy efficiency of buildings owned or operated by the authorities of the central public administration.

The main actions supported within the framework of this investment priority for the measures of energy efficiency improvement of public buildings and carrying out the annual renovation tasks of central public administration buildings refer to:

- improvement of the thermal insulation of the building envelope;
- rehabilitation and upgrading of installations for the generation and transport of heat, domestic hot water and of ventilation and air conditioning systems, including passive cooling systems, as well as the procurement and installation of related equipment and connection to the district heating systems, as appropriate;
- use of renewable sources of energy for ensuring the required amounts of thermal energy for heating and domestic hot water;
- implementation of energy management systems in order to increase energy efficiency and monitoring of energy consumption;
- replacement of fluorescent and incandescent luminaires with high long-life, high energy efficiency luminaires;
- other activities aimed at the achievement of energy efficiency objectives.

For the implementation of these measures in the buildings owned by or operated by public administration authorities, the use of a mechanism for the development and co-financing of energy efficiency projects by involving energy service companies (ESCOs) is taken into consideration. We believe that these companies are able to provide integrated solutions for the implementation and monitoring of the measures for energy efficiency, including the efficient use of funds.

Rehabilitation of centralised power supply systems using thermal energy in municipalities

„Heating 2006–2015 heat and comfort” national programme

By 31 December 2014, **42 territorial administrative units** were included in the programme for the rehabilitation and upgrading of centralised power supply systems using thermal energy in municipalities. The works carried out concerned the modernisation of sources of thermal power generation and of thermal units, thus contributing to the improvement of the quality of the public service for the supply of thermal energy.

According to the data reported by the beneficiaries of the programme, the energy efficiency achieved as a result of implementing the investment objectives is **27.33 thousand toe/year**.

5. Monitoring of large industrial consumers

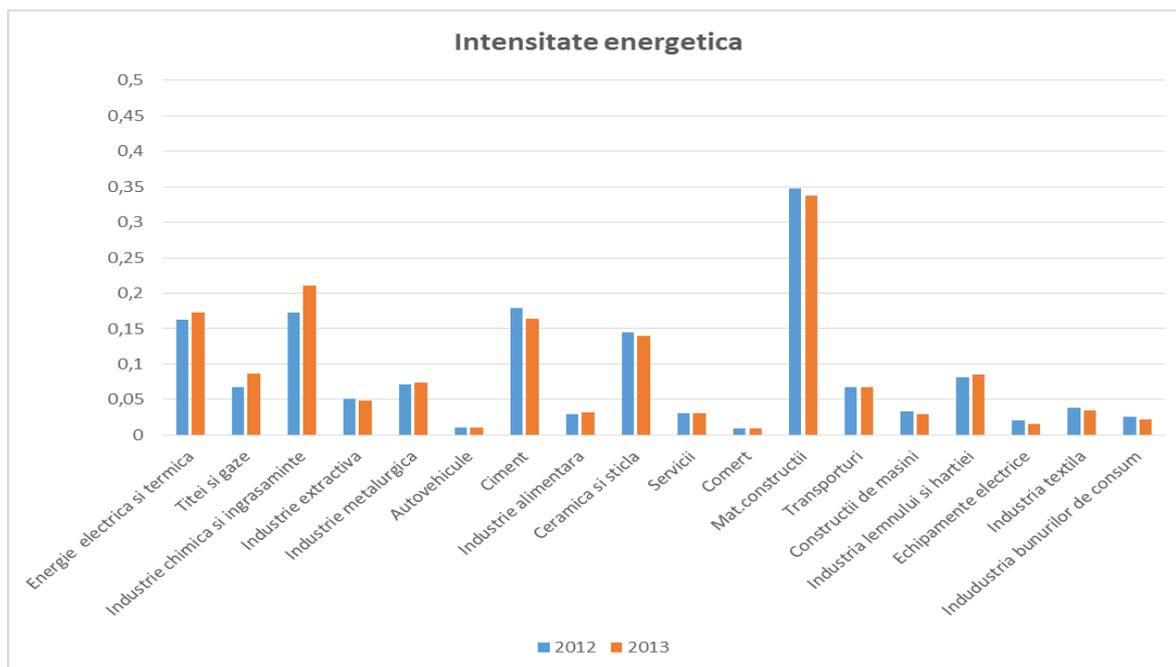
At national level, a number of **713 final energy consumers** (including 52 subsidiaries, worksites) with an annual energy consumption of over 1 000 toe/year were identified, having the following structures:

- over 50 000 toe/year – 40 (5.6%);
- between (5 000–50 000) toe/year – 145 (20.33%);
- between (1 000–5 000) toe/year – 528 (74.07%).

The energy management at the 713 final energy consumers (including 52 subsidiaries, worksites) with an annual energy consumption of over 1 000 toe/year is undertaken by 347 energy managers accredited by ANRE. Some consumers (210) opted for the outsourcing of the energy management service to a total number of 15 freelancer providers (authorised natural persons) and 20 energy service provider companies accredited by ANRE. In such context, the accredited and authorised energy management coverage is 78.1%, having the following structure:

- with own energy managers accredited by ANRE – 347 consumers (48.66 %);
- with freelancers (authorised natural persons) and energy service provider companies – 210 consumers (29.45 %);
- without accredited energy management – 156 consumers (21.9%).

**Figure 12 (toe/10³ RON)
Energy intensity**



- Electricity and heat
- Oil and gas
- Chemical and fertilizer industry
- Extractive industry
- Metallurgical industry
- Vehicles
- Cement
- Food industry
- Ceramic and glass
- Services
- Trade
- Construction materials
- Transports
- Machine engineering
- Timber and paper industry
- Electrical equipment
- Textile industry
- Consumer goods industry

It is important to note that five sectors (Electricity and heat, Oil and gas, Chemical and fertilizer industry, Metallurgical industry, Food industry) registered an increase in energy intensity, and three of these are large consumer segments; the highest increases were registered in the oil and gas sector (29%) and in the chemical and fertilizer industry (22%), which affects 37% of the overall consumption of the analysed sectors. In five sectors (Extractive industry, Cement, Ceramic and glass, Services, Constructions) a decrease in energy intensity was registered. In eight sectors the energy intensity technically remained constant.

For consumers of over 5 000 toe, the dynamic of consumption for 2010–2013 is listed in **Table 6** and **Figure 13**.

Table 6 – The structure and dynamic of energy consumption for consumers of over 5 000 toe/year

Economic sector	Energy consumption [toe/year]			
	2010	2011	2012	2013
Cement	539 300	580 500	597 900	526 100
Petrochemistry	969 010	1 005 120	981 980	1 013 590
Nitrogen-based chemical fertilisers	1 163 173	1 804 448	1 662 714	1 130 042
Metallurgy (ferrous)	1 718 947	1 639 244	1 397 644	1 363 601
Metallurgy (non-ferrous)	481 002	500 580	439 950	418 750

Cellulose and paper	31 733	34 221	47 885	52 434
Chemistry, plastic products and rubber	455 107	578 967	449 628	381 473
Machine engineering and electr.	126 933	128 398	126 100	129 510
Timber, glass, ceramic, construction materials	168 207	187 438	220 305	259 979

Figure 13

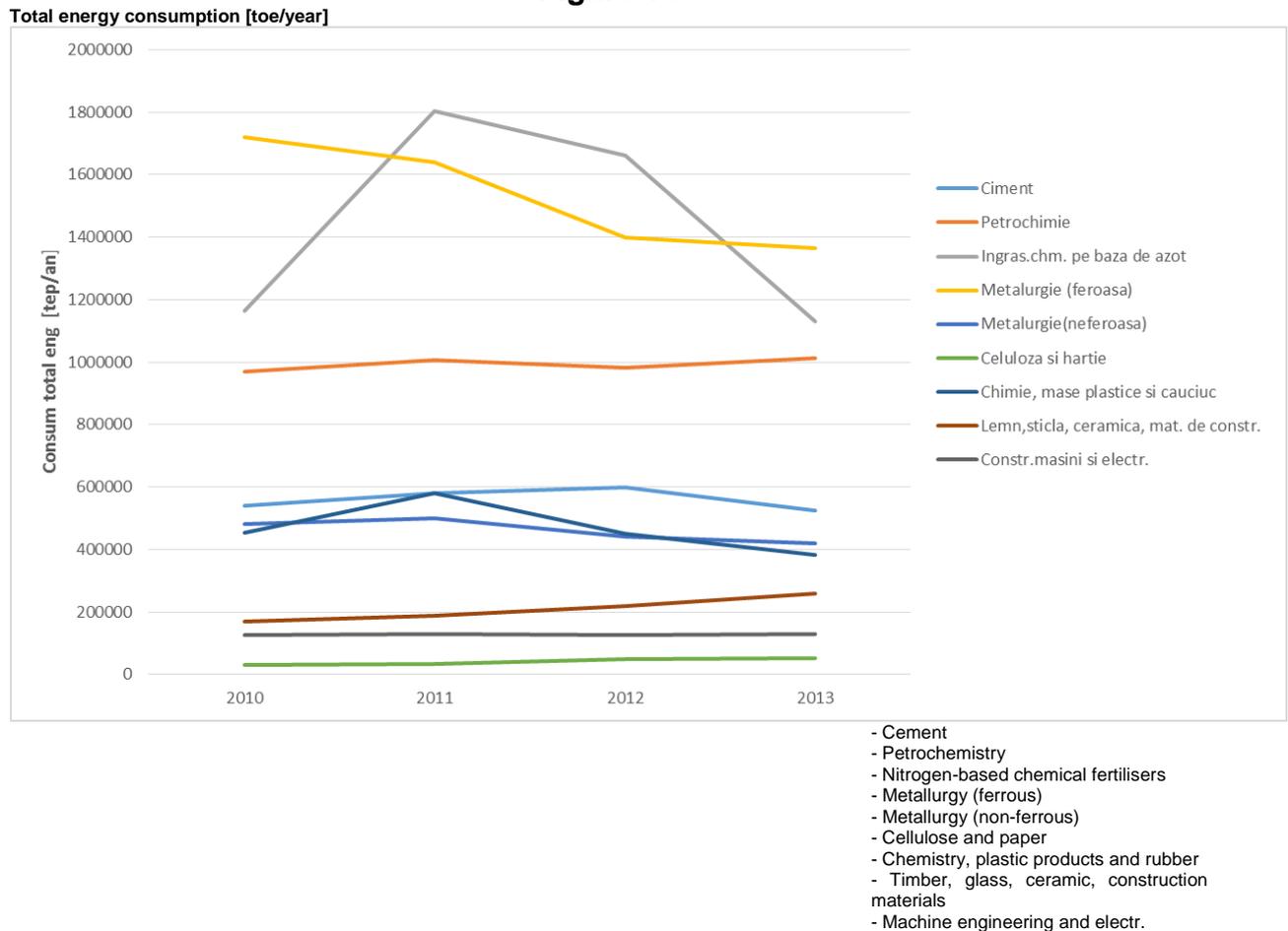


Table 6 and Figure 13 reveal the following elements:

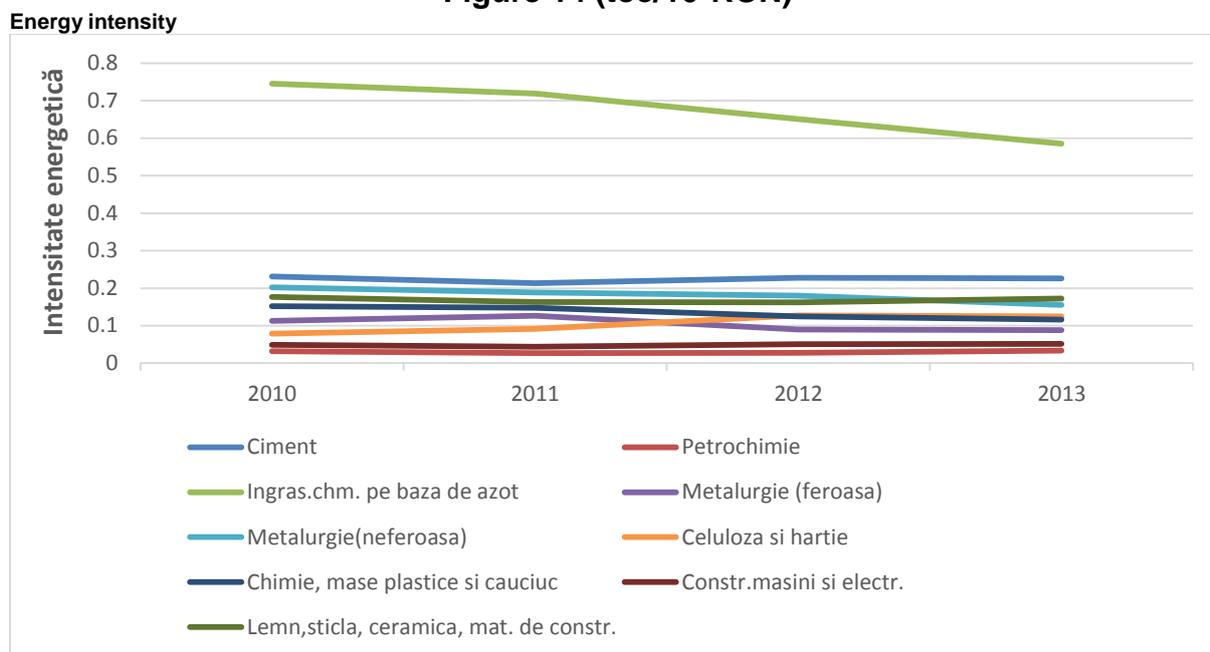
- The ferrous metallurgy and nitrogen-based chemical fertilisers sectors witnessed some significant decreases in consumption in the last three years, namely 38% and 20%, respectively;
- The Cellulose and paper and the construction materials sectors witnessed an increase of 53.5% and 38%, respectively in the last three years, but their weight in the overall consumption of the analysed sectors is reduced.

**Table 7 – Dynamic of the energy intensity indicator
– consumers of over 5 000 toe/year**

Energy intensity (toe/10 ³ RON)	2010	2011	2012	2013
--	------	------	------	------

Cement	0.2308	0.2129	0.2273	0.2261
Petrochemistry	0.0323	0.0267	0.0276	0.0337
Nitrogen-based chemical fertilisers	0.7456	0.7188	0.6511	0.5849
Metallurgy (ferrous)	0.1128	0.1266	0.0902	0.0878
Metallurgy (non-ferrous)	0.2025	0.1885	0.1803	0.1556
Cellulose and paper	0.0784	0.0917	0.1274	0.1248
Chemistry, plastic products and rubber	0.1522	0.1477	0.1246	0.1164
Machine engineering and electr.	0.04874	0.04379	0.05102	0.05163
Timber, glass, ceramic, construction materials	0.1764	0.1632	0.16254	0.1722

Figure 14 (toe/10³RON)



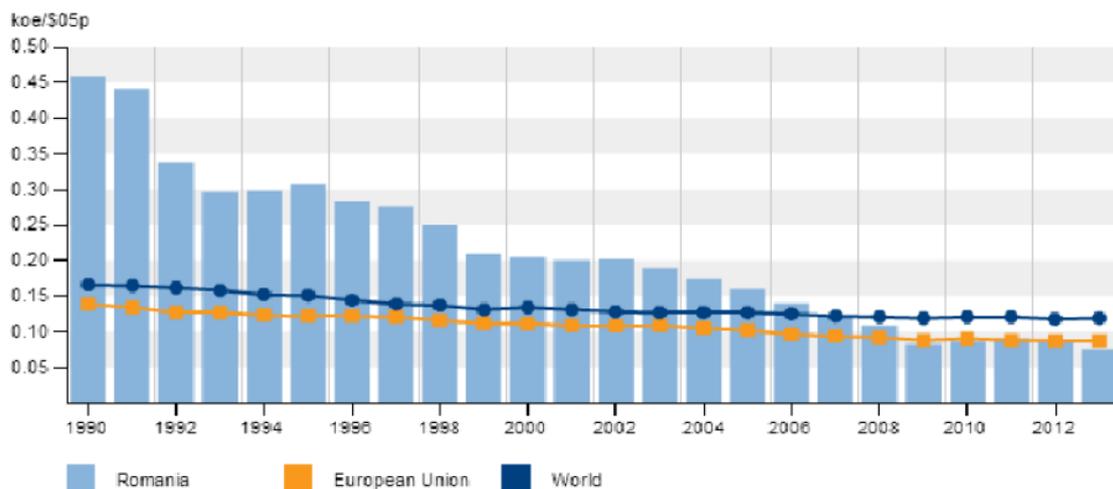
- Cement
- Nitrogen-based chemical fertilisers
- Metallurgy (non-ferrous)
- Chemistry, plastic products and rubber
- Timber, glass, ceramic, construction materials
- Petrochemistry
- Metallurgy (ferrous)
- Cellulose and paper
- Machine engineering and electr.

Figure 15

Energy intensity for the industry (to the added value)

Intensitatea energetica pentru industrie (la valoare adaugata)

Romania



The previous conclusions concerning the favourable evolution of energy intensity in the Romanian industry are confirmed by international studies conducted by prestigious institutions. **Figure 15** illustrates the evolution of this indicator after 1990 in accordance with the studies conducted by the World Energy Council.

From the analysis of the 7 large electricity distribution companies it results that:

The values of the own technological consumption (CPT) position these companies among the largest energy consumers (over 45 000 toe/year), some of them even reaching 120 000 toe/year. Besides the decrease of the national energy consumption, the own consumption was also reduced by 10–16% at the largest distribution companies. The rate of reduction at small companies is 3–4%.

Figure 16

Own consumption – toe/year

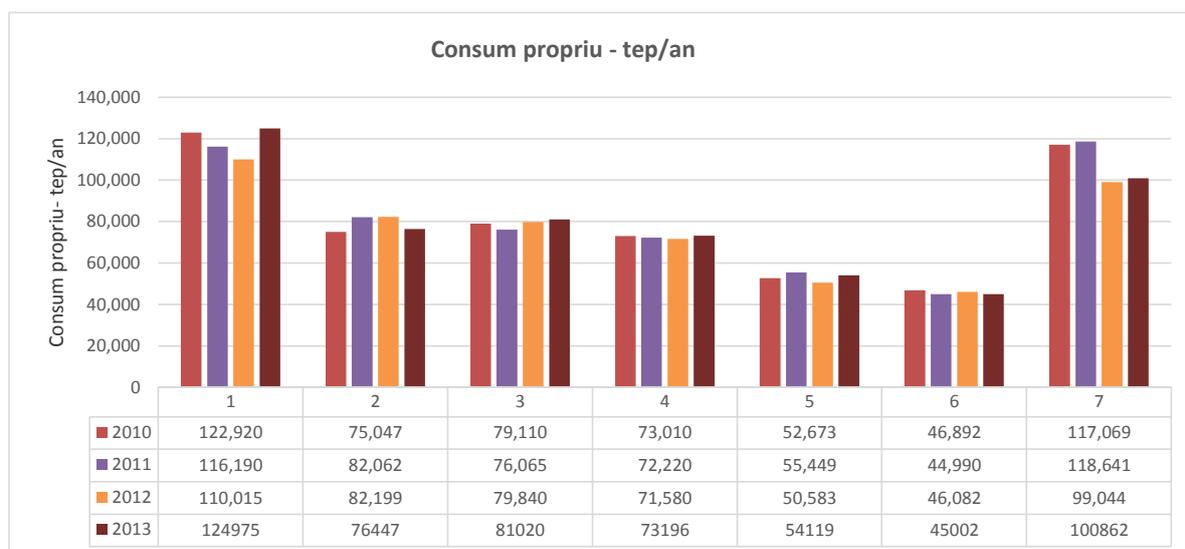
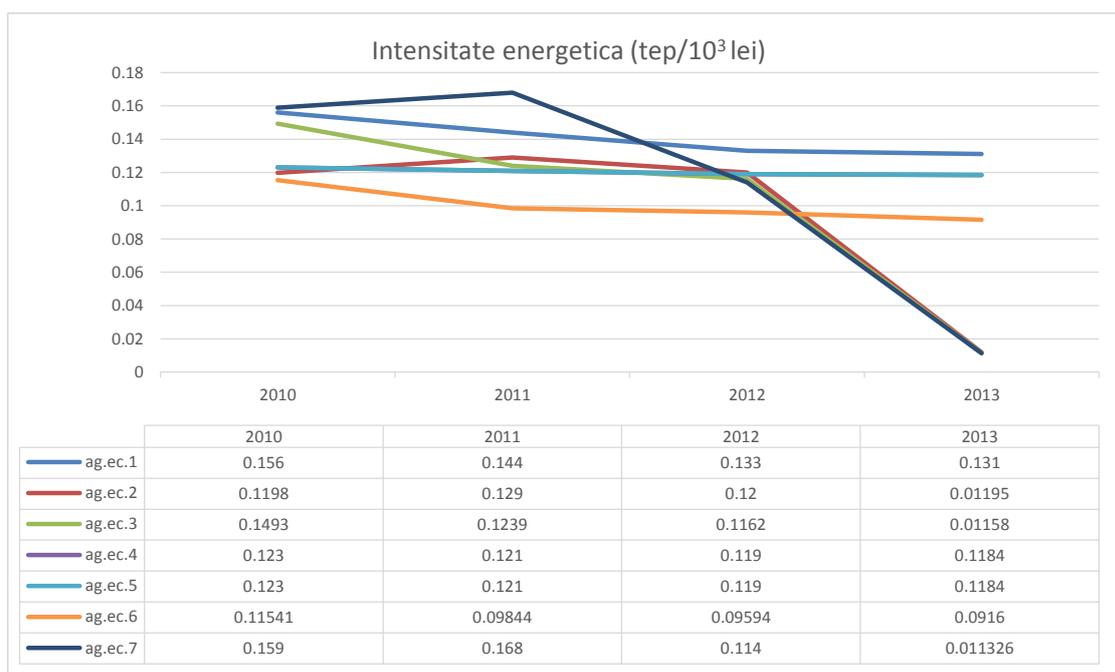


Figure 17



Energy intensity (toe/10³ RON)

Ag. ec = Economic operator

The energy intensity of the 7 operators from the electricity distribution sector recorded a decrease in all analysed companies, but there are sensible differences between the companies in terms of performance.

6. Situation of energy audits and access to the systems for authorising energy auditors and for accrediting energy managers

The authorisation of energy auditors / accreditation of energy managers supports the promotion and development of a system which ensures the availability of auditors able to unlock the potential of energy saving among final energy consumers.

The relevant number of energy auditors authorised each year indicates the opening of the energy services market, thus offering final energy consumers the possibility to conduct energy audits in accordance with the provisions of the law. Thanks to the information regarding the types of authorisations and to the contact details of the persons authorised by ANRE, made available on the website of ANRE, free and unconditional access of the interested parties is ensured.

The transparent and non-discriminatory minimum requirements for the energy audits prescribed by the **Rules for the authorisation of energy auditors** provides a basis for the development of some quality work having the aim of identifying certain measures for the improvement of energy efficiency at the final energy consumer and of achieving the targets for energy saving undertaken by Romania in the **National Energy Efficiency Action Plan 2014–2020**.

At the end of the year **2013**, a number of **303 energy managers**, **151** natural person energy auditors, **42** legal entity energy auditors, **31** energy service provider companies (**17** of which were authorised natural persons) were accredited.

For the period 2010–2014, the situation of the energy audits conducted is presented in **Table 8** and **Figure 18**.

Table 8 – situation of the energy audits conducted between 2010 and 2013

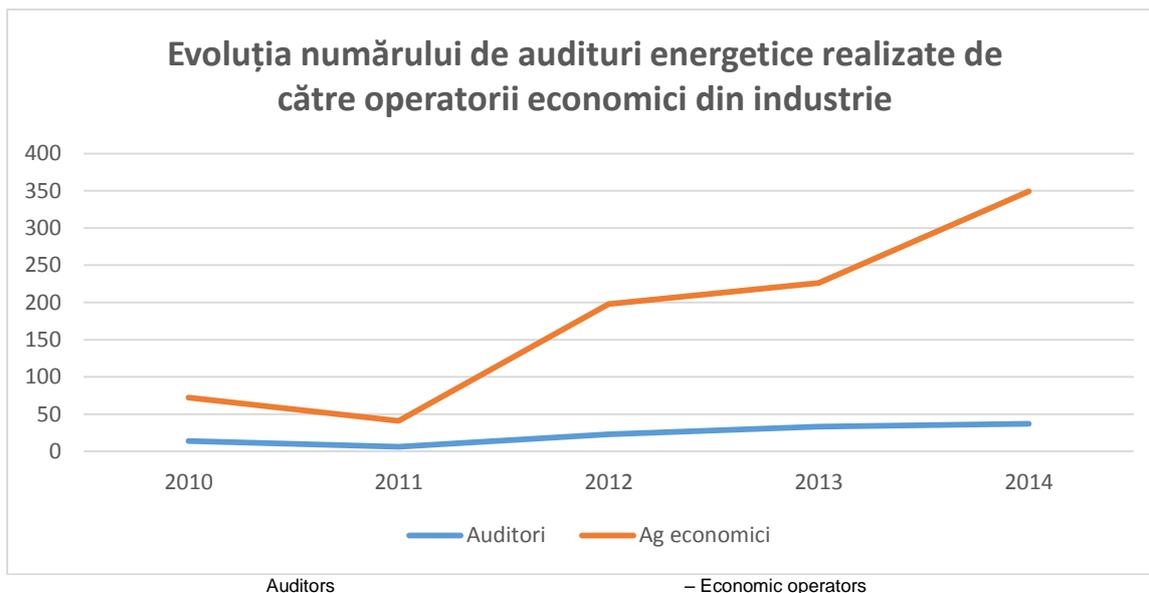
Year	Economic operators that conducted energy audits	Measures of energy efficiency	Estimated energy savings (toe)	Estimated expenditure (thousand RON)
2010	72	275	176 200	1 628 212
2011	41	103	112 171	128 813
2012	198	564	406 652	1 791 466
2013	226	701	196 705	663 684

What is interesting in the above Table is the relationship between the energy efficiency measures resulting from energy audits and the estimated energy savings. Thus, in 2010, **275 measures** of energy efficiency correspond with an estimated energy saving of **176 200 toe**, while in 2013, **701 measures** of energy efficiency correspond with an estimated energy saving of **196 705 toe**.

There are several possible explanations for this evolution:

- the measures forecast in 2010 were powerful investment measures (retechnologisation, replacement of equipment, etc.) with a high impact on energy saving, as also demonstrated by the invested amounts;
- as the number of measures of energy efficiency increases, the energy saving decreases. This is proven also by the amounts allocated for investment. This situation may be explained also by the fact that operators took low-cost or no-cost measures, or the measures consist in the “replacement of external lighting with leds”, that is, low-cost investment with reduced saving. This approach derives also from the economic crisis set in after 2010, and which resulted in the decrease in the income of economic operators, but also from the fact that for some operators the investment in energy efficiency is not economically justified.

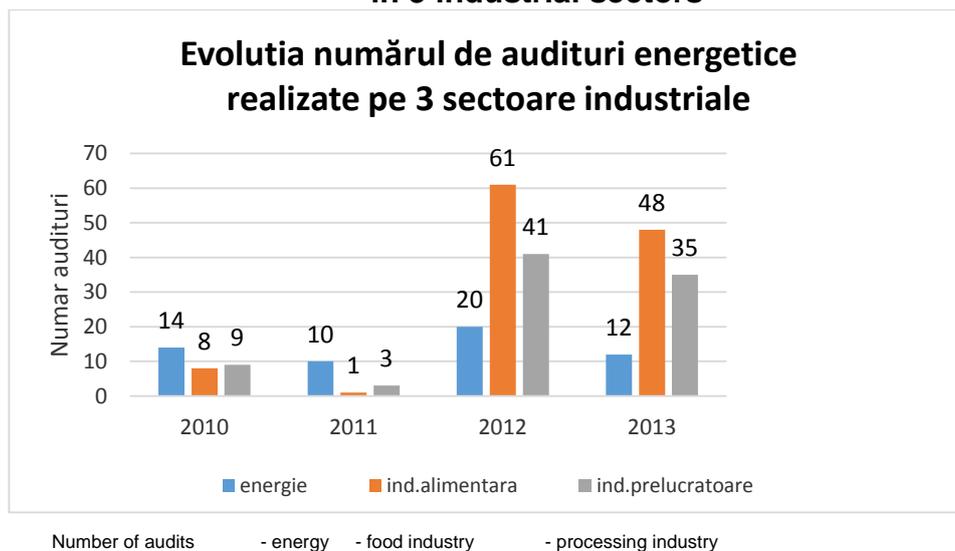
Figure 18
Evolution of the number of energy audits conducted by the economic operators of the industry



Between 2010 and 2014 the number of energy audits requested by economic operators of the industry rose significantly. The factors that led to this increase include: application of the legislation on energy efficiency, the rise of electricity and natural gas prices, raising awareness among final energy consumers and implicitly, a change in behaviour.

As a result of the development of the supply and demand mechanism between 2010 and 2014, the number of natural persons and legal entities being authorised as energy auditors also rose.

Figure 19
Evolution of the number of energy audits conducted in 3 industrial sectors



A remarkable increase in the number of energy audits conducted during 2012-2013 is observed as opposed to 2010–2011, with regards to the food industry, processing industry and the energy sector. The increasing consumer awareness is

one of the main reasons behind this trend, together with the continuous rise of electricity and natural gas prices.

7. Meeting European Union targets

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

Romania has set as national indicative target concerning energy efficiency a **primary energy saving of 10 million toe** by the year 2020, which constitutes an estimated **19% decrease in primary energy consumption (52.99 million toe)** through the PRIMES 2007 model as a realistic scenario.

The achievement of this target would ensure a primary energy consumption of **42.99 million toe** in 2020, with a final energy consumption of **30.32 million toe**.

The National Reform Programme 2014 is a framework platform for defining reforms and economic development priorities for Romania during a period of 12 months (July 2014 – June 2015), in accordance with the *Europe 2020 strategy* and the documents resulting from the European Semester 2014.

7.1 The progress recorded in the promotion of electricity production from renewable sources

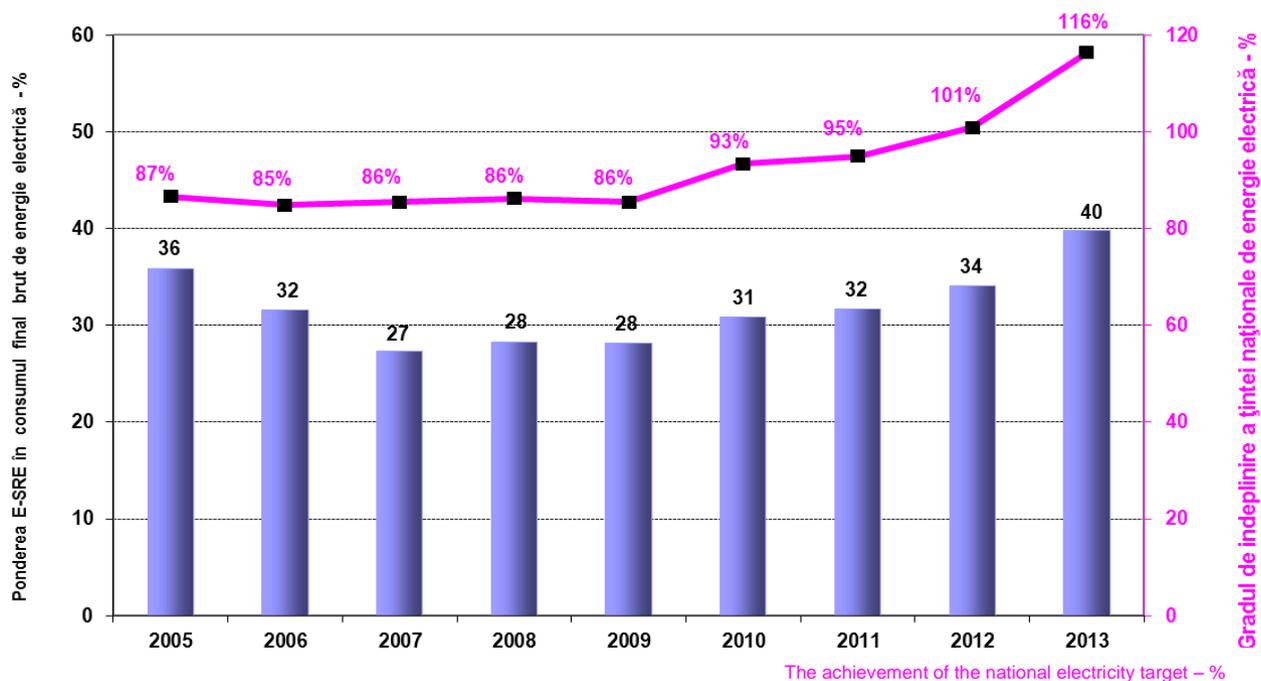
The promotion of electricity production from renewable sources (E-SRE) is an imperative of the current period at the level of the European Union for the following reasons: environmental protection, increasing energy independence from imports by the diversification of energy supply, as well as because of economic and social cohesion reasons. Consequently, taking into consideration the high level of the investment expenditure relating to the production of E-SRE, all European states have put in place support schemes for E-SRE.

In this context, by Government Decision No 1892/2004 *establishing the support scheme of electricity production from renewable energy sources*, a promotion system of green certificates was introduced in Romania, which is a scheme oriented towards competitive market mechanisms, such as the mandatory quota system combined with the trading of green certificates. The promotion scheme put in place was reconfirmed by Act No 220/2008, hereinafter referred to as *Act*, which proposes to make the scheme more attractive to investors by introducing new facilities, including awarding more green certificates, differentiated by the type of technology for E-SRE production. The promotion system of green certificates established under the Act was authorised by the European Commission through *Decision C (2011) 4938 on State aid SA 33134 (20011/N) for Romania – Green certificates for promoting electricity from renewable sources*.

The evolution of the achievement of the national target of E-SRE in the gross final electricity consumption in Romania between 2005 and 2013 is shown in **Figure 20** below:

Figure 20

The share of E-SRE in the gross final electricity consumption – %



With regards to the promotion system of green certificates, ANRE shall particularly focus on the following:

- ✓ Monitoring and fluidisation of the functioning of the green certificates market;
- ✓ Avoiding the risk of over-compensation of E-SRE producers;
- ✓ Maintaining an acceptable impact on the energy bill of final consumers.

7.2. The progress recorded in the promotion of electricity produced from high-efficiency cogeneration

The support scheme for the promotion of high-efficiency cogeneration was established in Romania by Government Decision No 219/2007 *on the promotion of cogeneration based on a useful heat demand* (transposing into national legislation Directive 2004/8/EC, *on the promotion of cogeneration based on a useful heat demand in the internal energy market*, which as of 5 June 2014 was replaced by the provisions of Directive 2012/27/EU) and implemented by 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 a useful heat demand*.

By the new **Directive 2012/27/EU on energy efficiency**, transposed by Act No 121/2014 on energy efficiency, the European Commission places a special emphasis on the promotion of high-efficiency cogeneration.

The scheme offering bonuses is a state aid (N 437/2009 – Romania) authorised by the European Commission, which declared it compatible with the common market in accordance with the provisions of Article 87 (3) point (c) of the EC Treaty, by Decision C(2009)7085. The authorisation was published in the Official Journal of the European Union (C31/9 February 2010). The effective date of entry into force of the scheme offering bonuses was 1 April 2011.

For achieving the national targets for *Europe 2020* in the field of **energy efficiency**, progress was recorded in the application of the *state aid scheme for the promotion of high-efficiency cogeneration*, and the total amounts awarded as a bonus between April 2011 and December 2013 amounted to 2.67 billion RON.

Table 9 – The amount of fuel used for the cogeneration of electricity and heat

– ANRE Report –

Year	Total fuel used by cogeneration units	Fuel used for cogeneration (Annex No II – Directive 2004/8/EC)	of which: - solid fossil fuel	Black oil	Natural gases	Renewables and waste	Other fuels
	PJ (Peta J)	PJ (Peta J)	%	%	%	%	%
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

Figure 21
The amount of fuel used for the cogeneration of electricity and heat

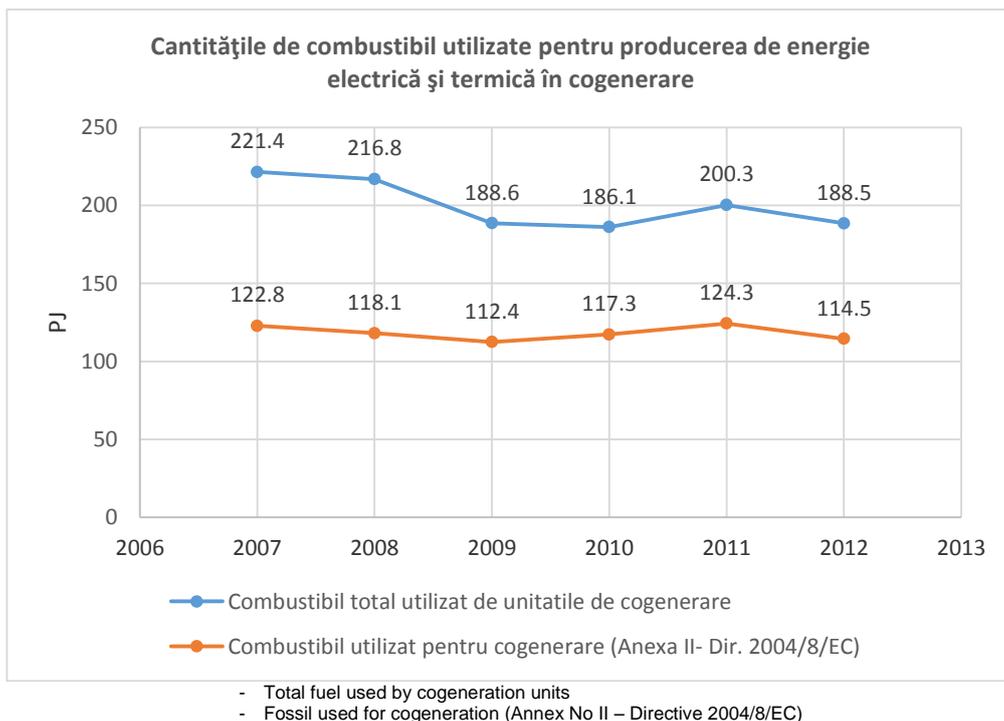


Table 10 – High-efficiency cogeneration of electricity and primary energy savings obtained through cogeneration

Table 10

– ANRE Report –

Year	High-efficiency cogeneration of electricity (Annex No III – Directive 2004/8/EC)	Fuel consumption in high-efficiency cogeneration (Annex No III – Directive 2004/8/EC)	PES in absolute values (Annex No III – Directive 2004/8/EC)	PES (Annex No III – Directive 2004/8/EC)
	TWh	PJ	PJ	%
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

PES – primary energy savings as opposed separate production of energy

Figure 22

High-efficiency cogeneration of electricity and primary energy savings obtained through cogeneration

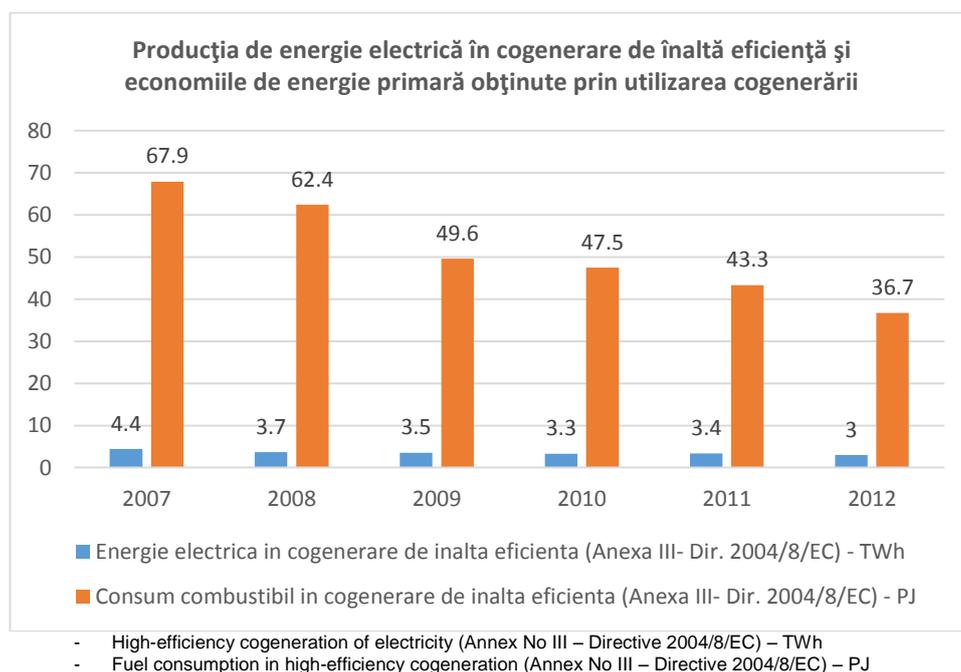


Table 11 – Results of the application of the support scheme for the period 2011–2013

– ANRE Report –

Indicator	Unit of measure	2011	2012	2013
Total amount of contribution invoiced to consumers and exporting suppliers 1)	thous and RON	690 931	928 877	1 072 840
Amount of electricity invoiced to final consumers (including that consumed by self-supplying suppliers and producers) to which cogeneration contributions were applied	GWh	32 639	46 450	44 930
Amount of electricity invoiced to final consumers	GWh	1 465	1 108	1 959
Amount of electricity produced in high-efficiency cogeneration benefitting from the support scheme	GWh	3 491	6 008	5 654
Total value of bonuses due to cogeneration producers that are beneficiaries of the bonus scheme	thous and RON	594 473	978 098	1 098 112
Amount of electricity imported with guarantees of origin for the high-efficiency cogeneration of electricity, for which the reimbursement of the contribution was requested	GWh	0	0	0
Energy saving achieved in high-efficiency cogeneration of electricity, which benefit from	GWh	2 131	3 498	3 430

bonuses, in compliance with the provisions of the <i>Rules of eligibility</i>				
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8. Analysis of the structure of energy consumption at final consumers

As far as the analysis of the evolution of the structure of electricity consumption at final consumers is concerned, from the data processed by ANRE for the year 2013 based on the data presented in **Table 12**, the following can be ascertained:

Table 12

– ANRE Report –

	2008		2009		2010		2011		2012		2013	
	GWh	%										
Consumatori alimentati in regim reglementat	23416	51%	23046	55%	21365	49%	20289	44%	20779	45%	18966	43%
Casnici	10376	23%	10990	26%	11246	26%	11590	25%	11987	26%	11670	27%
Necasnici	13040	28%	12057	29%	10119	23%	8699	19%	8792	19%	7296	17%
Consumatori alimentati in regim concurential	22414	49%	18536	45%	22075	51%	25525	56%	25105	55%	24805	57%
Casnici		0%		0%		0%		0%		0%		0%
Necasnici	22414	49%	18536	45%	22075	51%	25525	56%	25105	55%	24805	57%
Consum final total	45830	100%	41583	100%	43440	100%	45814	100%	45884	100%	43771	100%

	2008		2009		2010		2011		2012		2013	
	GWh	%										
Consumers with a regulated energy supply	23416	51%	23 046	55%	21 365	49%	20 289	44%	20 779	45%	18 966	43%
Household	10 376	23%	10 990	26%	11 246	26%	11 590	25%	11 987	26%	11 670	27%
Non-household	13 040	28%	12 057	29%	10 119	23%	8 699	19%	8 792	19%	7 296	17%
Consumers supplied with energy in a system based on competition	22 414	49%	18 536	45%	22 075	51%	25 525	56%	25 105	55%	24 805	57%
Household		0%		0%		0%		0%		0%		0%
Non-household	22 414	49%	18 536	45%	22 075	51%	25 525	56%	25 105	55%	24 805	57%
Total final consumption	45 830	100%	41 583	100%	43 440	100%	45 814	100%	45 884	100%	43 771	100%

- the final electricity consumption recorded in 2013 decreased by approximately 5% as opposed to that recorded in 2012;
- decrease of the amount and share of final household consumption with approximately 3% in 2013 as opposed to 2012;
- the decrease of the consumption of non-household consumers that changed supplier and the decrease by approximately 1% of its share in the final consumption in 2013 as opposed to 2012;

- decrease in the consumption of non-household consumers supplied in a regulated system with approximately 17% in 2013 as opposed to 2012, as well as the decrease of its share in the final consumption.

In 2014 and 2015, the consumption of electricity invoiced at regulated prices is ensured by the inclusion in regulated contract of only certain electricity amounts which are produced by hydro-electric and nuclear power stations/groups, taking into consideration the continuous decrease of the electricity consumption invoiced at regulated prices, as a result of the deregularisation process carried out according to the Memorandum of Understanding signed by the Government of Romania with the European Commission.

Table 13 – Amounts of electricity sold by producers on the regulated electricity market

– ANRE Report –

Year	2013		2014		2015	
	Amount (TWh)	Participation share (%)	Amount (TWh)	Participation share (%)	Amount (TWh)	Participation share (%)
S.N. Nuclearelectrica S.A.	5.3	34.6	3.7	41	2.25	35
S.C. Hidroelectrica S.A.	3.98	25.9	5.3	59	4.16	65
S.C. Complexul Energetic Oltenia S.A.	2.5	16.0	0	0	0	0
S.C. OMV Petrom S.A.	1.5	9.8	0	0	0	0
S.C. Complexul Energetic Hunedoara S.A.	0.3	2.0	0	0	0	0
Producers that are beneficiaries of the support scheme awarding bonuses, which produce electricity in high-efficiency cogeneration	1.7	11.1	0	0	0	0
Producers with undispatchable energy groups	0.08	0.6	0	0	0	0

Total amount of electricity destined for the regulated market	15.3	100	9	100	6.4	100
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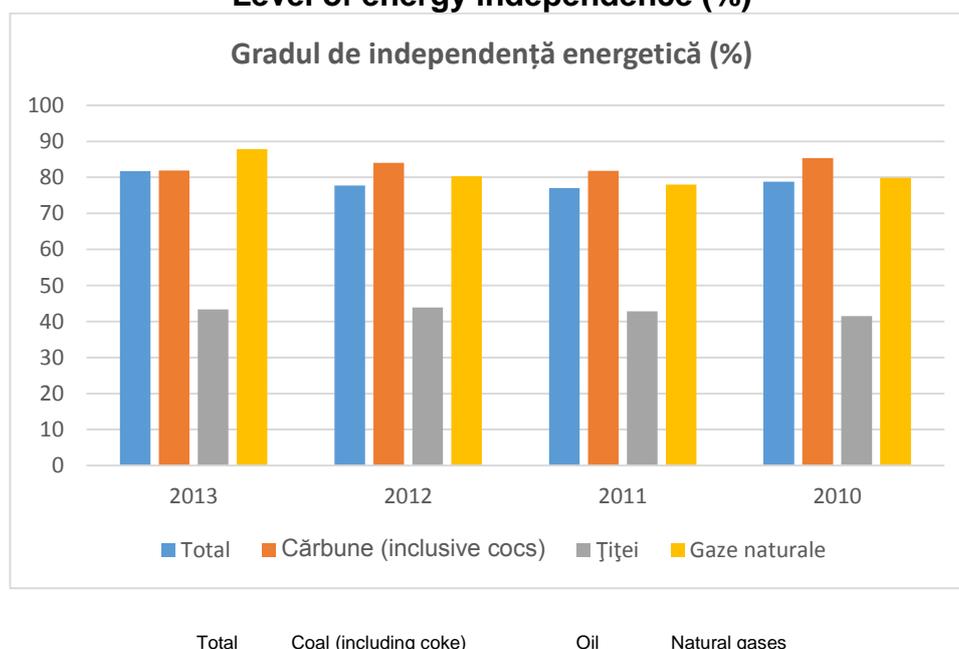
9. The level of energy independence

Table 14

Statistical Yearbook 2014

No	Indicator	Unit of measure	2013	2012	2011	2010
1	Total , including energy products obtained and consumed in national households	%	81.7	77.7	77	78.8
2	Coal (including coke)	%	81.9	84	81.8	85.4
3	Oil	%	43.4	43.9	42.8	41.5
4	Natural gases (Except gasoline and ethane form the extraction scaffoldings contained in oil)	%	87.8	80.3	78	79.9

Figure 23
Level of energy independence (%)



Between 2010 and 2013, the imports of natural gas had a downward trend, same as oil products.

10. The state of the centralised heat supply service

Between 1989 and 2014, the number of municipalities connected to the district heating network *dropped from 315 to 70 municipalities*, as it is shown below.

As a first indicator for presenting the current situation of the public centralised heat supply service at national level, we believe that these data are extremely eloquent. A number of 245 municipalities gave up on the public centralised heat supply service, accounting for 77.78% of the total number of municipalities connected to it in the year of reference (1989).

The situation of the municipalities connected to the public centralised heat supply system between 1989 and 2014 is shown in **Table 15** below.

Table 15

INDICATOR	1989	2009	2010	2011	2012	2013	2014
Municipalities currently connected to the system at national level ^{*)}	2 583	3 180					
Connected municipalities ^{**)}	315	121	116	110	86	78	70
Municipalities that gave up on the system	0	194	5	6	24	8	8

Table 15 reveals that in 1989 there were 315 municipalities where a centralised heat supply system operated, accounting for the 12.2% of the total number of municipalities (2583) existing in the administrative-territorial organisation of Romania in that year according to Act No 2/1989 on the administrative-territorial improvement of the territory of the Socialist Republic of Romania (repealed). The exit of municipalities from the centralised heat supply system had a sharp rise, and by the end of 2014, only 70 municipalities owned such systems. According to the National strategy on the heat supply of municipalities, approved by Government Decision No 882/2004, all studies reached the conclusion that centralised heat supply systems are more advantageous *in densely populated urban areas* from the perspective of energy efficiency and environment.

Figure 24

The situation of municipalities with and without a centralised heat supply system

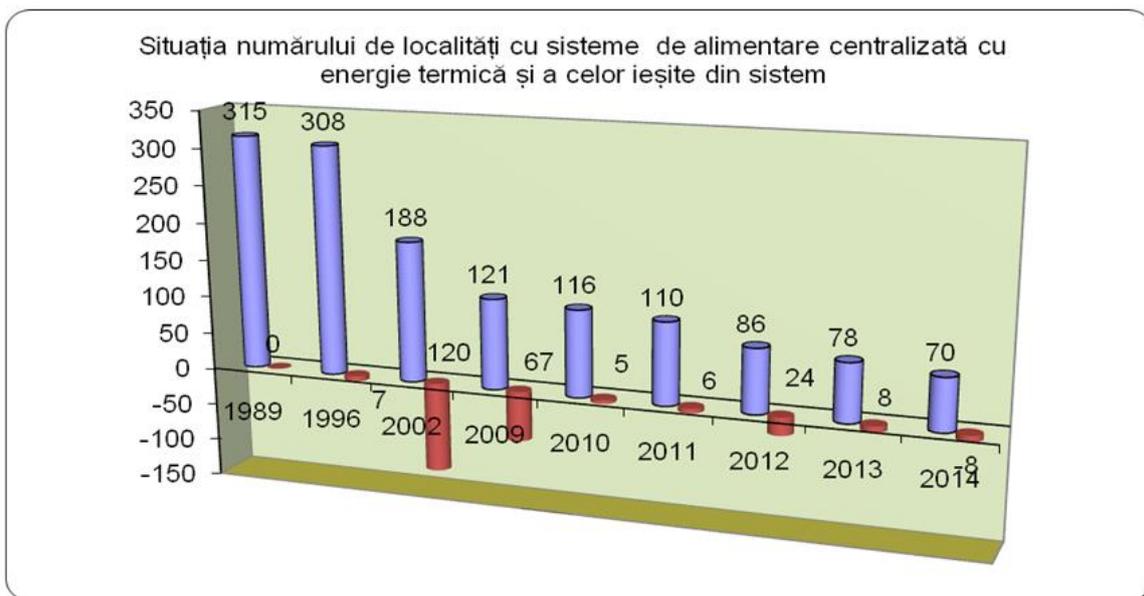
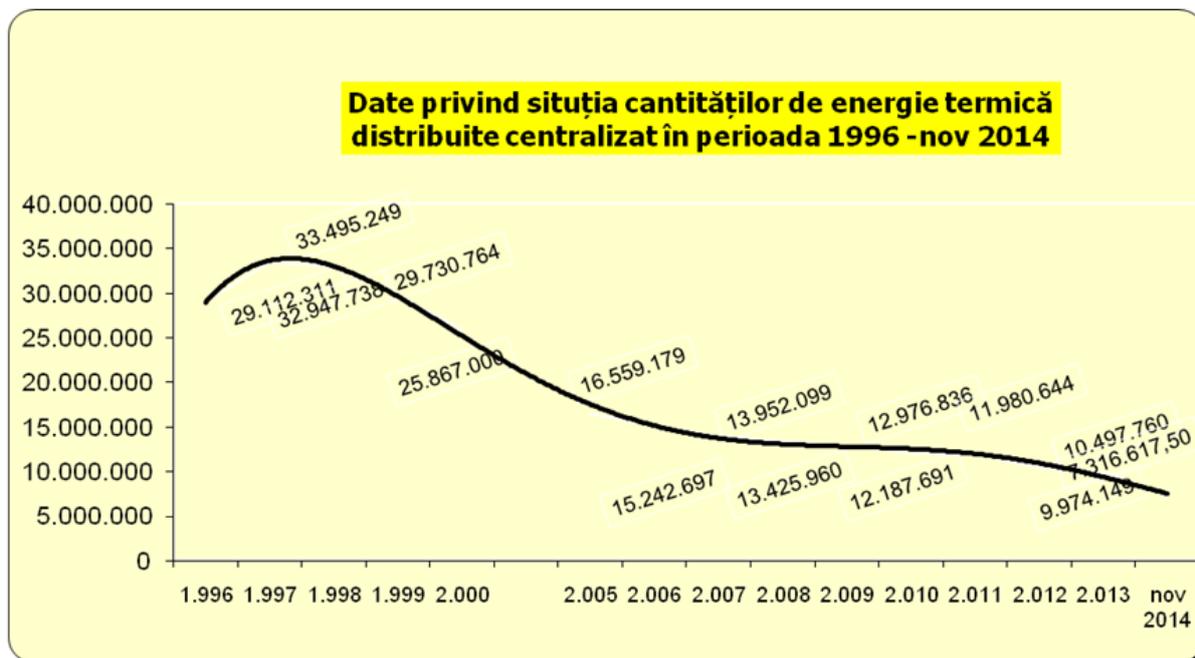


Figure 25

Data concerning the amount of heat distributed in a centralised system between 1996 and November 2014



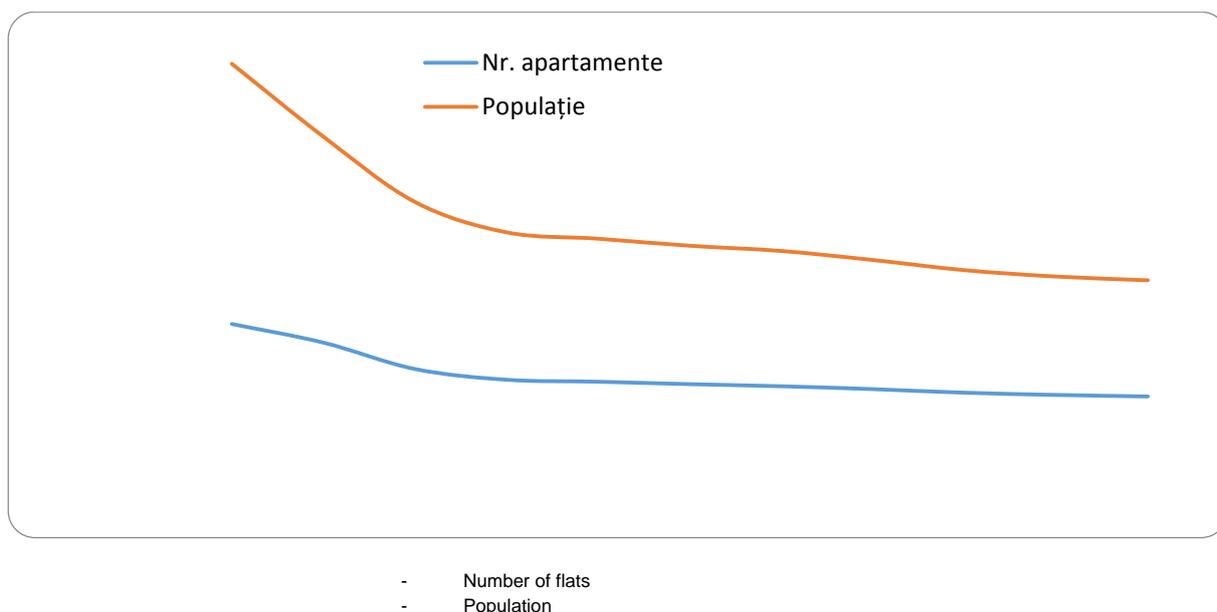
With regards to the above we would like to mention that the beneficiaries which gave up on the centralised heat supply service have ensured their thermal comfort demand by installing alternative heat supply systems (fireplaces, individual central heating units, etc.).

Another indicator for assessing the situation and quality of the centralised heat supply system is the direct recipient of the public service, the indivisible beneficiary,

the housing unit or the apartment. The main indicator in assessing the evolution or backdrop of the centralised heat supply service is the number of flats supplied with thermal energy by unit of time.

The evolution of the population and of the number of flats (based on records from the INS and ANRSC) is presented in **Figure 26** below.

Figure 26



According to the National strategy on the heat supply of municipalities by centralised heat production and distribution systems (Government Decision No 882/2004), the Romanian district heating sector should take into consideration the ongoing decrease in heat consumption by the population.

Table 16

Year	1992	2001	2004	2007	2008	2009	2010	2011	2012	2013	2014
No of flats	2 885 012	2 485 295	1 920 000	1 689 616	1 647 881	1 595 175	1 550 402	1 488 293	1 412 014	1 364 354	1 331 435
Population	8 463 550	6 900 000	5 500 000	4 849 198	4 713 000	4 562 200	4 449 700	4 256 500	4 038 400	3 902 000	3 822 000

The public centralised heat supply service is provided through the specific public or private technical infrastructure of the authority of local public administration or of the community development association, forming the centralised heat supply system of the municipality or of the community development association. Centralised heat is distributed by central heating units and district heating systems, which provide heat for a city, a district or a neighbourhood.

Table 17

Source: ANRSC

2013	2012	2011	Year	Thermal energy (Gcal) produced by fuel type
13 658 681.18	14 505 999.99	16 198 677.21	TOTAL of which:	
2 864 878.74	3 467 801.26	4 242 860.27	natural gases	
417 236.14	511 158.95	598 571.65	(thousand m ³) fuel consumed per year	
7 973 452.70	7 956 315.39	8 802 319.56	purchased for distribution	
29 343.47	27 574.18	50 509.20	CLU	
3 991.89	1 880.90	6 573.56	(thousand m ³ /ton) fuel consumed	
164 412.00	165 949.80	173 226.20	black oil	
21 321.44	21 192.70	27 931.70	(thousand m ³ /ton) fuel consumed per year	
96	76	109	gasoline	
10.4	8.3	11.9	(thousand m ³ /ton) fuel consumed per year	
2 417 570.17	2 703 143.74	2 725 938.32	coal	
683 163.97	866 723.80	743 824.30	(thousand m ³ /ton) fuel consumed per year	
126 705.62	77 710.70	86 844.39	biomass	
3 849.88	4 121.00	4 266.99	(thousand m ³ /ton) fuel consumed per year	
13 051.20	13 832.64	14 623.36	sawdust	
6 026.00	8 033.00	8 513.00	(thousand m ³ /ton) fuel consumed per year	
69 171.28	67 736.11	72 701.19	geothermal water	
1 867.83	1 869.20	2 019.60	(thousand m ³ /ton) fuel consumed per year	

As a matter of fact, according to the existing legal framework, i.e. the Government Decision No 246/2006 approving the *National strategy for speeding up the development of public utility services*, Government Decision No 882/2004 approving the *National strategy on the heat supply of municipalities by centralised heat production and distribution systems*, and Government Decision No 1661/2008 approving the *National programme for increasing energy efficiency and the use of renewable sources of energy in the public sector for 2009-2010*, **the development of the centralised heat supply system is a strategic option given that their replacement with other individual systems based on gas leads to the unsound**

use of primary energy resources and requires investment in new infrastructures for their distribution.

The main issues faced by local energy service providers:

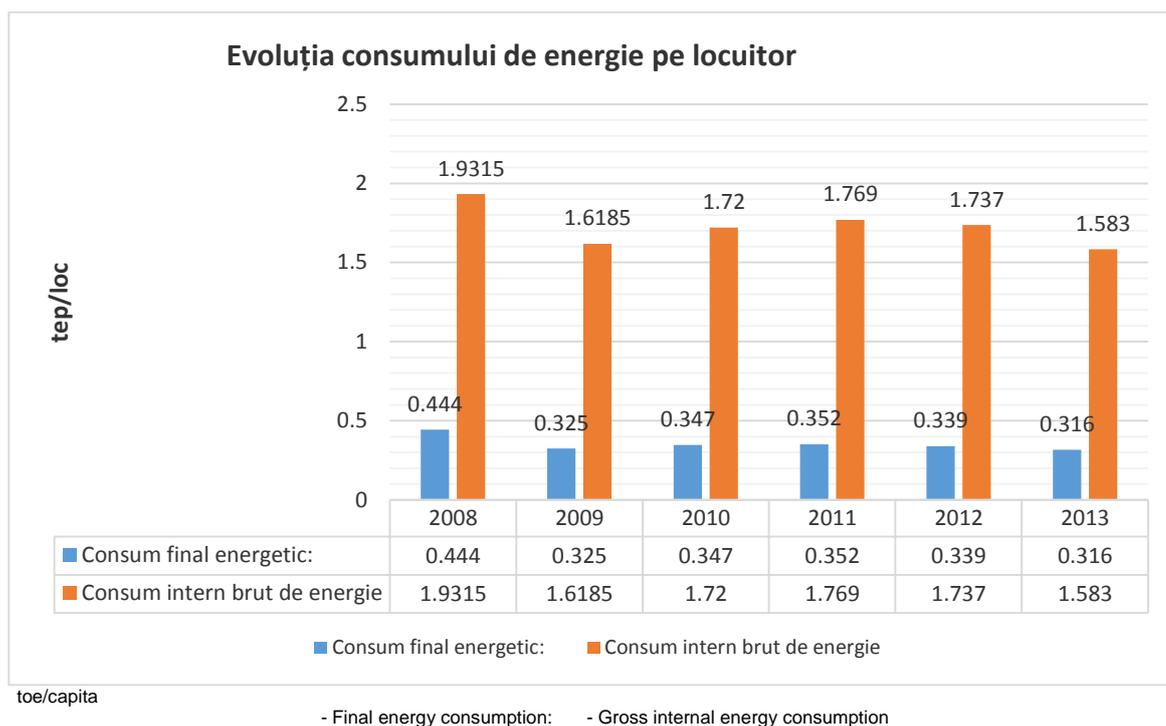
- the existing centralised systems for heat production need to be adapted to the new, reduced heat consumption, which requires their modernisation and development in order to function more efficiently and comply with environmental requirements;
- for densely populated urban areas, all studies have reached the conclusion that from the perspective of energy efficiency and the environment, centralised heat supply systems are more advantageous, and **cogeneration** should constitute the main reason for the restructuring of the system for producing and distributing heat,
- a major goal for the public centralised heat supply service should be the **increase of energy** efficiency on the entire chain: resources, production, transport, distribution, consumption,
- the use of renewable energy sources for the reduction of thermal energy prices and compliance with environmental requirements.

Conclusions

For several years, Romania has followed an upward tendency with regards energy efficiency in national economy. In 2013 these tendencies were obvious:

- energy consumption decreased despite economic growth,
- energy efficiency indicators improved.

Figure 27
Evolution of energy consumption per capita



The measures for the restructuring of the national economy, implementation of energy efficiency programmes (including programmes funded by the European Union) in all economic sectors and for the population as well as the promotion of the use of renewable sources of energy has substantially contributed to these tendencies.

The value of the “primary energy intensity” indicator (the relationship between the gross primary energy consumption at national level and the gross domestic product) largely depends on how the value of the gross domestic product is expressed. The value of this indicator is 2.36 times higher than the EU-28 average if the GDP is expressed in Euros 2005, but it is 9% lower than the EU-28 average if the GDP is expressed in Euros PPC.

The primary energy consumption of 30 889 million toe recorded in 2013 is significantly lower than the one recorded in 2012, i.e. 33 664 million toe. The decreasing trend was maintained in 2010, and the growth of the Romanian economy and of the other European Union member states is quite modest. The perspectives are not at all encouraging at EU and even global level. The issue is not whether the target of 10 million toe by the year 2020 can

or cannot be achieved, but it is quite likely that Romania shall exceed this target and save 12-15 million toe by 2020, with all its consequences.