REFERENCE ELEMENTS OF THE NATIONAL ECONOMY RECENT ENERGOINTENSITY LEVEL

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Abstract - This paper is structured into four parts. The first part referes to the importance of the main concernes regarding the insuring of energetic resources and the performance of the energetic systems. The second part describes the working methodology, defining and presentig the econometric model of some energointensity indictors. The third part of the article presents the results obtained and the last part of the paper presents the analysis conclusions.
Keywords: national economy, economic sectors, indicators, energointensity

1.INTRODUCTION

An important challenge of the EU level is ensuring access to clean energy, in the context of climatic change and the growth of energy demand at global level [1]. The European energetic policy targets all the energetic resources, the scarce resources (petrol, gas, coal, nuclear fuel) but also the renewable resources (hidro, solar, wind, geothermal) aiming to generate conditions that shall lead to an economy with low energy consumption and stoping the climate change [2,3], based on the following atributes: durability, competitiveness, energy supply safetyness. For implementing the EU sustainable development main objectives there have been established real targets with reference to the energetic sector, that could be presented as following [2,3]:

- Reduction of GES with 30% by 2020;
- Increasing the share of renewable energy with 20% by 2020;
- Increasing biofuels share to 10% of the total fuels used by the year 2020;
- Reduction of the global primary energy consumption with 20% by 2020.

In the EU integration context, Romania's connection to the general economic and energetic frame is essential.
In Romania, the energetic intensity issue is much sharper than at EU level, because our country registeres a primarenergetic itensity of more than 350 kgoe / 1000 € [4,5] compared to a much lower share registered at EU level (aproximately 150 kgoe/1000 €.
In the given situation, we consider usefull any analysis regarding the specific energy consumption at national economic level and at sectorial level, highlighting the evolution of consumption reduction solutions.
The paper presents the recent comparative evolution, of some refference elements of specific energy consumption at the three of the most important sectors of the national economy.

2. WORKING METHODOLOGY

In this article we will reffer to the recent evolution of specific energy consumption at industrial level, transportantion level and population level, three of the most important sectors that consumed almost 89% of the total energy in 2014.
The National Statistic Institut [6] published a data base and in this article we care to use the following indicators:

- IEE – Energetic intensity of the economy [kgoe/1000€];
- CEI – Final energy consumption of the industry [thtoe];
- CET – Energy consumption of the transportation sector [thtoe];
- CEP – Population energy consumption [miitep];
- PIB_I – Industry GDP [mld€];
- VTP – Passengers volume [passengers – km/PIB];
- VTM – Freight transportation volume [tons – km/PIB];
- POP – Populatio of Romania [loc].

For all the above mentioned indicators we will use the annual values published by NSI and we will calculate the relative values and also the volution rates. If we will use „X"as indicator, the relative value of the year „t" [x(t)] is calculated by reporting to the refference year (t_0), and the evolution rate ($\Delta x(t)$) is calculated with the following relation (2):

$$x(t)=\frac{X_{(t)}}{X_{(t0)}}100 \qquad (1)$$

$$\Delta x(t)=\frac{x(t)-x(t0)}{x(t0)} \qquad (2)$$

For comparative analysis and evolution trends we will calculate the share of specific energetic consumption, that are relative units, as the following:

$$ce_{xy}(t)=\frac{x(t)}{y(t)}100\ [\%] \qquad (3)$$

Where in this case:
x(t) – Relative value of energy consumption;
y(t) – Relative value of the unit that the energy consumption reports to.

For our relative indicators values we will use simmilar abreviations with the ones used for the values published by NSI, using the following notation: iee, cei, cet, cep, pib_I, vtp, vtm and pop.
We will define, calculate and graphically represent the following indicators:

- Specific energy consumption share of the industry

$$ce_I(t) = \frac{cei(t)}{pib_I(t)}100[\%] \quad (4)$$

- Specific energy consumption share of transportation sector

$$ce_T(t) = \frac{2cet(t)}{vtp+vtm}100[\%] \quad (5)$$

- Specific energy consumption share of population.

$$ce_P(t) = \frac{cep(t)}{pop(t)}100[\%] \quad (6)$$

The evolution of the units calculated by using relations (4, 5, 6) will be graphically displayed.

3. RESULTS

In the follwing section of the article we will use National Institute of Statistics (NSI) data base and primary units values that are displayed in Table 1.

Table 1: Values of primary units

Year / Indicator	2007 (t_0)	2008	2009	2010	2011	2012	2013
IEE [kgoe/1000€]	441,5	409,9	387,4	394,6	393,7	378,9	334,7
CEI [thtoe]	9630	9115	6612	7020	7093	6796	6307
CET [thtoe]	4729	5399	5377	5107	5313	5391	5364
CEP [th toe]	7559	8089	8077	8124	7883	8095	7748
PIB [th€]	29,7	33,53	28,4	29,86	31,5	31,7	33,74
VPT*[%]	100	97,6	108,05	107,6	103,8	105,5	110,2
VTM*[%]	100	89,7	68,2	63,5	62	65,4	67,2
POP[thloc]	21,13	20,65	20,44	20,29	20,2	20,1	19,94

Source: Author's calculation based on the information available at NSI data base
(*) – For this specific indicators, NSI uses relative values for year 2000. For operational conditions, the table presents the recalculated values taking in consideration the year 2007 as refference.
Fig 1 Representes the evolution of: iee, ce_I, ce_T, ce_P.
[%]

Analysing the results allows us to make the following remarks. The energetic intensity of the national economy registeres a negative trend in the analysed period of time, decreasing with over 24% between [2007 – 2013]. The specific energy consumption in the transportation sector registerd an osscillating variation during the analysed period of time, increasig with over 28% due to the rise of energetic consumption and also the decrease of the transportation volume.

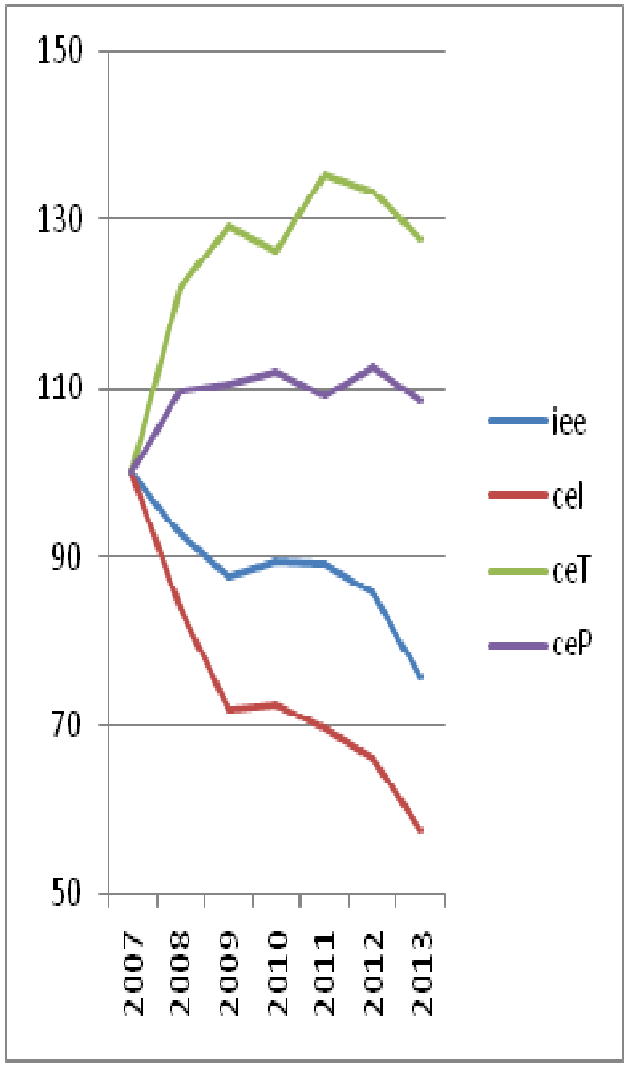

Fig 1: Specific energy consumption evolutionfor the main sectors of the national economy. Source: Author's representation based on the information available in the NSI data base

The industrial energetic intensity presents a strong decreasing trend during the analysed period of time, registering a decrease of over 42% during the 6 years of analysis. The population specific energy is osscillating in the analysed period of time marking a 8,5% increase with reference to 2007.

4. CONCLUSIONS

- For detailing the assessement and the characterisation of the energetic performance we propose that besides the economical energetic intensity to use specific consumption indicators for the main sectors of economy.

- The obtained results reflect that the decreasing of energetic consumption of the national economy

is conducted through decreasing the industrial energetic intensity, while the other sectors (transportation and population) register an increasing value for the period analysed.

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