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Article

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THE EFFECTS OF APPLYING COMMUNITARY POLICY UPON THE ROMANIAN ENERGETIC SYSTEM AND THE FUTURE DIRECTIONS REGARDING SUSTAINABLE DEVELOPMENT

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Abstract: *The study provides an overview on the effects and perspectives of implementation of sustainable development policies in the energy sector in Romania, by reference to the European Union. The purpose of this study is to highlight, by interpretation of the analyzed indicators, how becoming a member of the European Union has helped to improve living standards by assuming the defined objective of sustainable consumption and production. Thus, the pre and post accession trends of electricity consumption, the dependence on imported energy, the negative impact of the use of traditional energy sources on the environment and the importance of the EU Directives on finding alternative sources to support the production and energy consumption were analysed.*

Keywords: socioeconomic development; sustainable consumption and production; energy dependence; renewable energy.

JEL Classification: Q2; Q3; Q4; P28.

INTRODUCTION

The 70's marked the beginning of discussions regarding the environment and the limited character of natural resources. Thus, in 1972, in Stockholm, the first Conference regarding the Environment takes place where the negative impact of human activity on environment and its effects on long and very long term is being discussed. Starting with 1983 the World Commission on Environment and Development comes forth, following the resolution adopted by the United Nations General Assembly.

The concept of durable development was established in 1992, during the Rio de Janeiro Conference on environment and development and defines that type of development based on which the fulfilling of the present human needs does not compromise the possibilities for the next generations to fulfill their own needs (Brundtland Report, 1987).

If, in beginning, the concept of durable development offered the answer for the ecological crisis due to the industrial exploitation of natural resources and irreversible degradation of the environment with a strong accent on its conservation, currently, the meaning of this concept has extended to include the quality of life in all its aspects. Thus, achieving the durable development

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objective, implies not only equity and justice between generations, but diminishing the discrepancies that exist between the states.

Currently, the durable development became subject for international scientific debates, gaining political meanings in the context of globalization (The National Strategy for Durable Development of Romania 2013 – 2020 – 2030, 2008). In this framework, global action plans that can be implemented locally on biodiversity conservation, climate change or usage limitation of chemicals harmful for the environment have been drafted (Local Agenda 21, 1992).

For the European Union durable development became a political objective of major importance, being mentioned in the Maastricht Treaty of 1997. Starting with 2001, European Union Strategy for Durable Development was adopted and improved in the following decade, having as main objective the improvement of the quality of life for the present and next generations through ensuring the prosperity and social cohesion within a healthy environment.

In Romania the National Strategy for Durable development was established and aims at maintaining the balance between economic development and the attention of the society for the environment. The strategy has 13 main objectives: the structural transformations and macro economical balance, climate change and clean energy, durable transport, durable production and consumption, preservation and managing the natural resources, public health, social inclusion, demography and migration, global poverty and the challenges of durable development, education and professional development, scientific research, technological development and innovation, labor productivity and improvement of the occupancy rate, investment policy and diversification of financing sources, administrative capacity and quality of public services. Among these, information regarding climate change and clean energy in our country are being analyzed and compelling answers regarding Romania's evolution as a consequence of complying with the policies of the European Union on durable development are being granted.

2. EUROPEAN UNION POLICY FOR DURABLE ENERGETIC DEVELOPMENT

The main actor on the world economic and political scene, the European Union is an important competitor for the North American countries (USA and Canada), but also for those in East Asia (China, Japan, South Korea). The main factor that ensures development and economic competition of the European Union is energy (Leca, 2013).

Promoting the concept of durable development, the energy policy of the European Union defines three main directions for action: durability, competitiveness, and food security (Leca, 2013). Moreover, energy policy is the instrument used by the European Union in fighting climate change.

The first step of the European Commission regarding the common energy policy was taken in 1995, following the drafting of the Green Card (For a European Union Energy Policy). It was followed by the White Charta (An Energy Policy for the European Union) and the communications named Green Paper for a Community Strategy – Energy for the Future: Renewable Sources of Energy. These documents represent the foundation of the current energy policy of the European Union (RenERg EuReg, 2007).

At global level climate change, depletion of natural resources and increasing issues relating to the environment led to the necessity of finding some solutions to produce energy for ensuring an increasing level of energy consumption.

At the European Union level, the most important issue is generated by the increase of energy dependency of member states towards imports.

An important role in defining the European Union objectives regarding durable development of the energy sector is attributed to the Kyoto Protocol, following which the third Green Charta - Towards an European strategy on the security of energy supply was elaborated.

The Report of the European Environment Agency of 2010 presents the results of the European Union for the purpose of achieving the objective of reducing the carbon emissions of greenhouse gases as mentioned in the Kyoto Protocol (EEA Report, 2010).

Next, in 2009 the European Union issued a legislative package of compulsory directives regarding the energy sector – climate change, aiming at the following:

- energy cost reduction and the increase of energy efficiency;
- increase the rate of renewable energy in the total consumption level at the European level;
- increase the percentage of biofuel in the fuel used in transportation.

Following the economic and financial world crisis, the objectives have been partially achieved. Thus, the 2020 Strategy was proposed, that, besides the above mentioned objectives, mentioned new sources for durable economic growth. Currently two big projects are undergoing, the Power Perspective 2030 and Roadmap 2050.

3. THE CHARACTERISTICS OF ROMANIAN ENERGY SECTOR PRE AND POST EU ASCENSION

After obtaining the status of the European Union Member State, Romania took on its obligations for implementing the policy and legislation for the integrated Strategy for energy and climate change issued by the European Union, namely the reduction of the greenhouse gases emissions.

According to the specialists in the field, the Romanian energy sector is not sustainable yet. This is caused by the lack of energy infrastructure and late restructuring. Moreover, the beginning of favorable changes in the field for sustainable energy was made under the impulse of international organizations and financial and institutions (Leca, Muşatescu 2006).

The pre-ascension period shows an energy market that lacked transparency and real competition due to interest groups and political interventions meant to facilitate signing of important contracts with private suppliers against the national interest.

The national energy strategy for 2007-2020 approved by the Romanian Government in 2007 was aligned and harmonized with the new regulations in the field of climate - energy change mentioned in *Europe Strategy 2020* and *EU Energy Strategy 2011-2020*.

For the purpose of revealing the consequence of respecting the EU policies on the Romanian energy sector, the following indicators were analyzed: Romania's energy dependency in comparison with the European Union, energy intensity of Romanian and European economies, the percentage of renewable energy from the total energy consumption, greenhouse gases emission levels and the volume of hazardous waste produced by the economic sector.

Table 1 – Energy dependence (%)

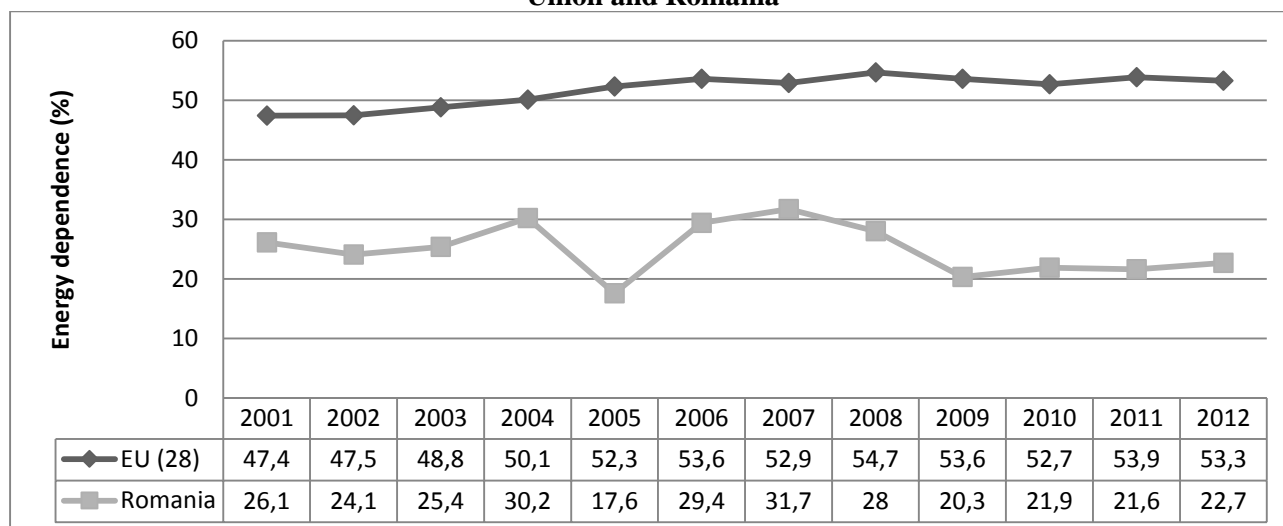
Year/Country	EU (28)	Romania
2003	48.8	25.4
2004	50.1	30.2
2005	52.3	17.6
2006	53.6	29.4
2007	52.9	31.7
2008	54.7	28.0
2009	53.6	20.3
2010	52.7	21.9
2011	53.9	21.6
2012	53.3	22.7

Source: Eurostat (2014), *Energy dependence*, accessed on March 2014 at <http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&plugin=1&language=en&pcode=tsdcc310>

According to the information from the above table, an increase of electrical energy dependency of the European Union can be discerned, quantified through the comparison between the net energy imports and the sum of gross consumption. If we refer to our country, we notice a decrease of the dependency towards energy imports from 25.4% in 2001 to 22.7% in 2012. This percentage places Romania on the next to the last place in the ranking of energy dependent member states, followed only by Estonia (17%). In 2012, the only energy net exporter was Denmark (Eurostat 2014).

Maintaining a relatively reduced level of energy dependency is caused by the possibility of covering the necessary of Romania from its own internal production of fuel and the increase rate of hydro-energy and nuclear energy in the total of produced energy.

Figure 1 – The comparative evolution of the indicator of economic dependency (%) for the European Union and Romania



Source: Authors Representation

The dependency of the European Union on import of electricity increased in a linear manner in 2001-2006. The year 2007 marks a decrease of this number following the world financial and economic crisis. Starting with 2008 the values of this indicator were between 53 – 54%.

For Romania, the decrease in value of the indicator in 2005 (17.6%) is explained by the approaches of our country in order to establish the commercial balance and, implicitly, to fulfill the criteria for ascension to the European Union. The maximum value of electricity imports was reached in 2007 (31.7%) and dropped until 2009 (20.3%), currently being between the limits of 21 – 23%.

Table 2 – Energy intensity of the economy (kg of oil equivalent per 1 000 EUR)

Country/Year	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
EU (28)	170.9	168.3	169.2	166.9	164.0	159.3	151.9	151.0	149.0	151.5	144.0	143.2
Romania	579.5	572.8	567.7	515.9	491.3	471.4	441.5	409.9	387.4	394.6	394.4	379.0

Source: Eurostat (2014), *Energy intensity of the economy*, accessed on March 2014 at <http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&plugin=1&language=en&pcode=tsdec360>

This indicator is obtained by reporting the gross internal energy consumption of one country (measured in oil kg equivalent) and its Gross Domestic Product (reported at 1000 Euro) and explains both the energy consumption of an economy and its energy efficiency at global level.

According to the data in table 2, for the European Union the value of this indicator dropped with 16.21% from 170.9 kg of oil equivalent per 1000 Euro in 2001 to 143.2 kg of oil equivalent in 2012. Similarly, for Romania the decrease was with 34.6%, from 579.5 kg of oil equivalent per 1000 euro to 379.0 kg of oil equivalent per 1000 euro.

Table 3 – Share of renewable energy in gross final energy consumption (%)

Country/Year	2004	2005	2006	2007	2008	2009	2010	2011	2012
EU (28)	8.3	8.7	9.3	10.0	10.5	11.9	12.5	13.0	14.1
Romania	16.8	17.6	17.1	18.3	20.4	22.6	23.2	21.2	22.9

Source: Eurostat (2014), *Share of renewable energy in gross final energy consumption*, accessed on March 2014 at <http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&plugin=1&language=en&pcode=tsdcc110>

The values of this indicator reflects the efficiency of European Union Policies regarding the achievement of the objective for consumption an durable production in the field of electricity, expressing the quota of energy obtained from renewable sources out of the total gross consumption. Thus, for the European Union, the average value of this indicator has risen with 69.88%, from 8.3% in 2004 to 14.1% in 2012. For Romania, the increase of the value of the indicator was 36.31% from 16.8% in 2004 to 22.9% in 2012.

Table 4 – Greenhouse gas emissions by sector (1 000 tones of CO2 equivalent)

Year/Country	EU (28)	Romania		EU (28)	Romania
1990	5606072	244404	2001	5142906	136259
1991	5502368	199512	2002	5098755	138217
1992	5300790	174050	2003	5187853	145085
1993	5197601	169364	2004	5191729	142301
1994	5171452	166094	2005	5159610	141560
1995	5217697	172791	2006	5147762	145880
1996	5324126	175402	2007	5091464	142704
1997	5231669	161968	2008	4983579	140464
1998	5192751	145489	2009	4622601	120294
1999	5085963	130778	2010	4733816	116621
2000	5092754	133526	2011	4578469	123346

Source: Eurostat (2014), *Greenhouse gas emissions by sector*, accessed on March 2014 at <http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&plugin=1&language=en&pcode=tsdcc210>

The values of this indicator represent the equivalent in CO₂ of green gas emissions. For the analyzed period these values registered a continuous decrease, thus: the European Union average decreased with 19.33%, and the average of Romania decreased with 49.53%, fact that suggests the efficiency of European Union policies regarding this aspect of economic life.

Table 5 – Generation of hazardous waste by economic activity (kg per capita)

Country/Year	2004	2006	2008	2010
EU (28)	180	n.a.	194	200
EU (27)	181	204	195	202
Romania	106	49	25	31

Source: Eurostat (2014), *Generation of hazardous waste by economic activity*, accessed on March 2014 at <http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&plugin=1&language=en&pcode=tsdpc250>

According to the data provided in table 5, the average quantity of hazardous wastes in the European Union increased by 11.11% from 180 kg per capita in 2004 to 200 kg per capita in 2010. In Romania, for the period of time analyzed, the decrease was significantly greater (70.75%), from 106 kg per capita in 2004 to 31 kg per capita in 2010.

4. FUTURE DIRECTIONS FOR DEVELOPING DURABLE ENERGY

The issue of energy security goes beyond the European Union borders, for this reason it must be approached in a global manner. The exacerbation of environment issues, climate change and depletion of natural resources determined the most important international institutions to react in the sense of limiting and diminishing the negative effects that these can have on the quality of life of present and future generations. In the energy field, an example is set by the World Bank which proposes adopting a integrated energy strategy to lead the energy field towards equitable and efficient use and in harmony with the environment and natural resources. To achieve this objective, the decisions regarding production and consumption of durable electricity are being renewed, by increasing the quota of renewable energy sources, using new technologies and, not the least, by educating the consumer so as the impact of using traditional sources of energy on the environment to be limited.

Regarding our country, it could be noticed that the enactment of community policies and the attempt of alignment and harmonization with the values promoted by the European Union in the

energy field led to a visible improvement regarding energy consumption, dependency on imports, CO₂ emissions or the quantity of hazardous wastes for the environment.

During 1989 – 2006 it could not be discussed about a national strategy, but each field of activity drafted periodically its own sectorial strategy, independent of each other and less efficient than a national scale social and economic strategy. This is the reason for which, before gaining the status of European Union Member State, our country did not have favorable results in the field of energy.

Regarding the future actions of Romania for it to be included among European Union sustainable states, Professor Aureliu Leca refers in his work “Considerations on durable energy development of Romania” to the following measures:

- Establishing a specialized institution specific to the market economy to ensure the balance between national interest, the obstacles raised by the economic and financial crisis and the standards imposed by the European Union;
- Creating the Ministry of Energy and Resources as a government institution responsible for drafting the national energy strategy, management of primary and alternative energy sources, developing a specific energy infrastructure for the purpose of ensuring a durable development in the field of energy;
- Consolidation of energy strategy with environment strategy for an efficient legal framework proposed by the European Union;
- Diminishing the green gas emissions in general and particularly CO₂ with 20% until 2020 following the monetization of internal sources of natural gas and imposing upon all companies to respect the environment rules;
- Finalising the pilot programme which aims at using the Rovinari hydro-electric plant to gather and store the CO₂ in our country;
- According to Directive 2012/27/EU on energy efficiency, reduction of the final energy consumption with 20% until 2020;
- Finishing the national thermal energy rehabilitation for buildings programme started in 2002;
- Encouraging the use of renewable energy coming from renewable sources, according to the Directive 2009/28/CE;
- Drafting a national policy on centralized heating;
- Support the National Regulatory Agency for Energy (ANRE) regarding financial independence, autonomy, decisions making;

- Supporting the continuity of the Romanian nuclear programme for the purpose of diminishing the green gas emissions and increased price for fossil fuels;
- Creating a unique system of social assistance for energy;
- Increase the funding for research, development and innovation in our country in all fields of activity, consequently in the energy sector according to Energy Technology Plan of the European Union.

All these measures proposed for our country aim at including our country in a durable energy programme proposed by the European Union as a consequence of the challenges that the present and future generation face.

Each step at global, international, national and local levels is considering that threat not only for the quality of life but also the possibility of survival. Thus, there is the possibility that global energy demand of each state to surpass production and to remain without energy, and despair to lead to energy terrorism.

The solutions for these issues is the exclusive use of renewable energy sources (hydrogen based, solar power, wind power, etc.), global cooperation for ensuring energy security, creating the basis of new industries based on innovations in the field of energy.

CONCLUSIONS

The year of Romania's integration in the European Union remains as a reference year in the history of our country, a milestone where and from where we can report the results of each analyze, regardless of the subject. As for the study on measuring the impact of the European Union policies on the Romanian energy sector and future trends on durable energy development, the interpretation of the analyzed indicators offers an improved image of the energy sector as a result of complying with the European Union standards and giving a significant role to the environment.

Thus, regarding the energy dependency of Romania on imports there is a decrease of 3.4% from 2001 to 2012, the energy intensity decreased by 34.6%, green gas emissions decreased by 49.53% from 1990 to 2011, following social responsibility of the corporations and respecting the environment policies by the participants in the economic activity and the percentage of energy coming from renewable sources of the total consumption has risen by 69.88%.

The enactment by Romania of the durable energy policy of the European Union had numerous advantages: increasing energy efficiency and limit, as much as possible, energy losses, graduate replacement of old technologies with less polluting and energy efficient ones, developing a

modern and innovative industrial sector based on the production and supply of electricity, diversification of the suppliers portfolio and introducing those who's activity is based on monetizing sources of renewable energy.

In the meantime, it must be mentioned the fact that, for a developing country like Romania, durable energy development is subject to uncertainties for the future. Thus, should be considered the links between the used technologies and technological infrastructure, availability of natural, financial and human resources, market availability and withdrawal of some investors that can affect or improve the competitive system, the end consumer preference towards a certain type of energy product.

One of the strengths of our country is the relatively low dependency on energy imports (Romania is the next to last in the ranking of the EU members). Despite this, following the estimates for a future increase of energy imports of energy resources, Romania will have to monetize as efficient as possible and as rational as possible its own supplies and to consolidate its relations with potential suppliers for long and very long term.

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