ENERGY MANAGEMENT OF ROMANIA. POTENTIAL FOR MODERNIZATION-DEVELOPMENT

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ABSTRACT
One of the main objectives of mankind in the current period is the overcoming of the barriers related to the lack of primary energy resources, which cause energy crises in different states regardless of the degree of economic development. In this paper, energy supply, is thermal energy of rural localities, is analyzed by using RES (renewable energy sources), namely biomass and solar energy non-polluting energy sources, which ensure a favorable environment.

KEYWORDS: *development, energy, management, resources.*

1. INTRODUCTION

According to some studies, it has been demonstrated that global fuel cuts will be exhausted over a period of 30-50 years. But another concern is that of environmental pollution as a result of the conversion of some forms of energy into others. Some of the negative effects on the environment are greenhouse effect, global warming and ozone depletion. At present, scientists pay special attention to energy issues, proposing various methods of energy security and mitigation of the environmental impact. Methods are introduced to streamline the operation of both energy-producing and energy-efficient installations. It seeks to improve the quality and efficiency of heat supply and hence to reduce energy consumption and greenhouse gas emissions. Catalyst projects of clean and renewable energy systems are initialized to be promoted and offered under conditions accessible to most consumers.
The national energy sector has to cope with the main internal and global challenges: security of energy supply, increasing economic competitiveness and reducing the impact on the environment. These challenges are particularly important, given that Romania needs to recover the economic performance gap with developed EU countries (Cistelcan, 2000). A major contribution to achieving these objectives is the increase of energy efficiency, one of the priority elements of the Romanian energy policy. In this context, Romania has created an appropriate legislative and institutional framework for promoting energy efficiency aligned with the Community acquis.
Energy costs represent an important share of overall production costs in most of the industrial sectors. Energy efficiency can be one of the best ways to address the economic growth problem of an economic agent, knowing that even the best technology and equipment consumes more energy than is strictly necessary for the industrial process. The experience of developed countries shows that energy savings of 15 ÷ 30% can be achieved with acceptable financial indicators.

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2. INVESTMENTS IN THE ENERGY SECTOR IN ROMANIA

2.1 Global developments and challenges in the energy sector

In an increasingly globalized economy, a country's energy strategy is carried out in the context of developments and changes taking place worldwide (Buhociu, 2000).
Total energy demand in 2030 will be about 50% higher than in 2005, and for oil will be about 48% higher. Known oil reserves can support current consumption levels only by 2040, and natural gas by 2070, while global coal reserves provide over 200 years to even higher levels of operation. Forecasts point to economic growth, which will imply increase energy consumption. (Leca, 2015).
In terms of the global primary energy consumption structure, the International Energy Agency's (IEA) reference and forecast report highlights for the next decade a faster increase in the share of renewable sources and natural gas. It is estimated that about a quarter of the primary energy resource needs globally will still be covered by coal.

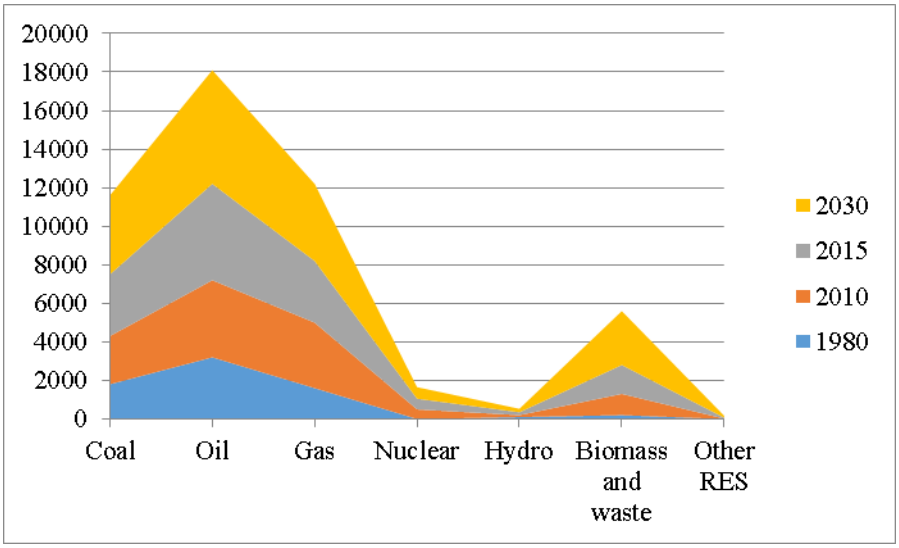

Figure 1. The evolution of global energy demand
Source: adapted from WEO (2006), OECD/IEA (2006)

Increased demand for energy combined with geopolitical factors, especially the situation in the Middle East, led to an increase in crude oil prices in the first decade of the 21st century, which also led to increases in gas prices. Another factor that has led to a rise in world oil prices was the lack of refining capacities, which requires the identification of medium and long-term solutions.
To all this has been added the tendency shown by some states to supplement stocks to deal with crisis situations. The above elements underpin the reorientation of the energy policies of countries that are net energy importers, in terms of increasing attention to renewable energy and improving energy efficiency.

2.2 Energy Policy of the European Union

Under the new Energy Policy of the European Union (EU), developed in 2007, energy is an essential element of development at Union level. But, to the same extent, it can be considered a challenge in terms of the impact of the energy sector on climate change, increasing dependence on energy imports and rising energy prices. To overcome these challenges, the European Commission (EC) considers it absolutely necessary for the EU to promote a common energy policy based on energy security, sustainable development and competitiveness (Bouzarovski & Petrova, 2012).

With regard to security of energy supply, the EU expects that dependence on natural gas imports will increase from 58% today, to 85% in 2030 and for oil from 82% to 94% over the same period. With regard to sustainable development, it should be noted that in 2016, the energy sector is one of the main greenhouse gas producers at EU level (Pye & Dobbins, 2015). Unless drastic measures are taken at EU level, in the current energy consumption evolution and technologies existing in 2007, greenhouse gas emissions will increase at the EU level by around 5% and global by around 55 % by 2030. At present, nuclear power is one of the largest CO2-free energy sources in Europe. In terms of competitiveness, the EU's internal energy market ensures fair and competitive energy prices, stimulates energy savings and attracts investment in the sector. (Dubois & Meier, 2016).
The EU is increasingly exposed to instability and rising prices on international energy markets, as well as to the consequences of the fact that hydrocarbon reserves are gradually being monopolized by a limited number of holders. Possible effects are significant: for example, if the price of oil would increase to USD 100 / barrel in 2030, energy imports into the EU-28 would cost about EUR 170 billion, which means EUR 350 / year for each EU citizen. The European Commission proposes the following objectives in the set of documents that represent the EU's New Energy Policy:

- reducing greenhouse gas emissions by 20% by 2020 compared to 1990.
- increasing the share of renewable energy sources in the total energy mix from less than 7% in 2006 to 20% of total EU energy consumption by 2020;
- increase the share of biofuels to at least 10% of the total energy content of fuels used in transport in 2020;
- reducing global primary energy consumption by 20% by 2020.

2.3 Costs and benefits

With the exception of large-scale hydropower plants, the costs of producing electricity in renewable plants are now higher than those related to the use of fossil fuels in line with the European Commission Communication on the Promotion of Renewable Energy Sources published in December 2017. Stimulating the use of these sources attracting investments in energy units using renewable sources is achieved through support mechanisms, in line with European practice.

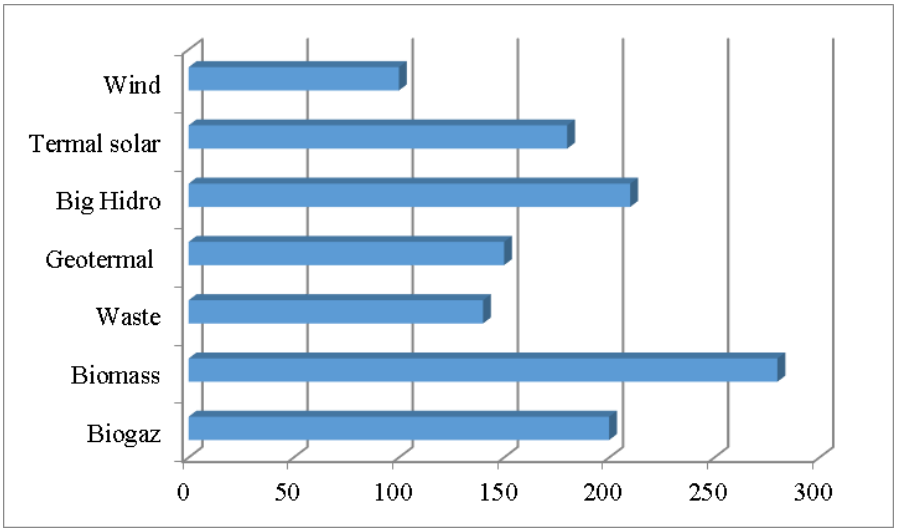

Figure 2. Electricity Product Costs (Euro / MWh) - Variation Plans in Electricity Production Costs in RES (2017)
Source: adapted from European Comission- DGTREN (2017)

The efficiently adjustable potential of wind and hydroelectric power is substantially below the technically viable, due to environmental restrictions (Sichigea & Berceanu, 1998).
The use of renewable energy sources has a significant impact on the national electricity system, being necessary:

- studies on the impact of the take-up of electricity produced by wind turbines, micro-hydropower and cogeneration using biomass in the transmission and distribution network (110 kV or higher), in different scenarios, in areas with high potential;
- development of transport networks and distributed in the concept of smart grid;

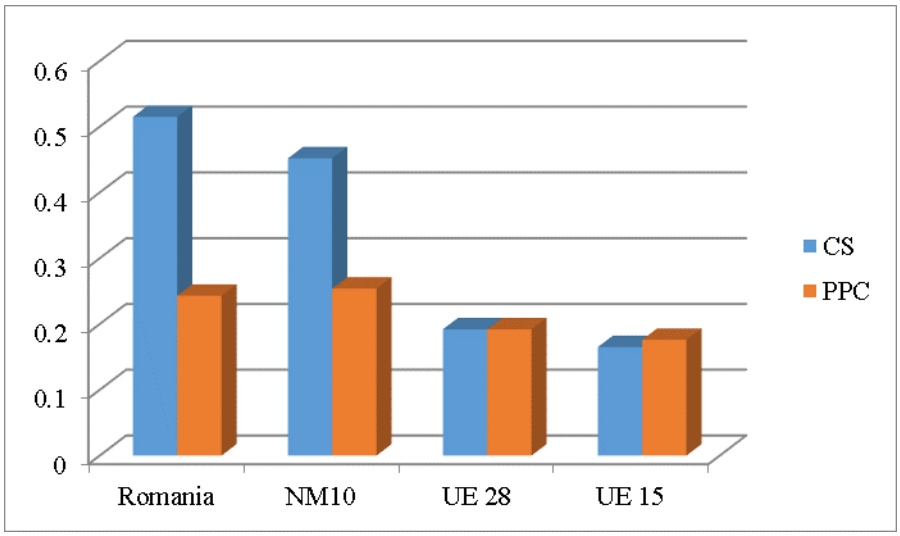

Figure 3. Primary energy intensity (tep/1000Euro 2016)
Source: adapted from Eurostat data (2016)

CS - exchange rate
PPC - purchasing power parity

The structural adjustment of the economy, as well as the increase in resource efficiency, led to a reduction of the primary energy intensity from 0.605 toe / 1000Euro2005 in 2000, to 0.492 toe / 1000Euro2005 in 2005, the calculation being made at the exchange rate.
As a result of this strategy, it was established as a strategic objective to improve the energy efficiency in Romania throughout the natural resources, production, transport, distribution and final use chain, by optimally using the mechanisms of the market economy, estimating a reduction of about 3% per year of energy intensity on the national economy as a whole by 2015.

3. ENERGY SECURITY - ESSENTIAL ELEMENT OF ECONOMIC DEVELOPMENT

The energy strategy has major implications for national security. An essential role in this area is to ensure energy security by: ensuring a balanced balance between demand and national energy production, optimizing the structure of primary energy consumption and increasing energy efficiency. Priority will be given to diversifying sources and routes of supply and limiting dependence on imported energy resources (Dragota, 2003).
Another influence on national security is related to the security of energy installations. The European Union has established a unitary approach to the protection of energy infrastructures ("Critical Infrastructure Protection in Countering Terrorism" adopted by the EC in 2004). Romania, as a member state of the European Union, takes over the tasks of the Member States from the documents related to the security of the installations.

In order to increase the safety factor in the gas supply, in order to avoid major disturbances in the national transport system and respectively in the gas supply of consumers in crisis situations, in accordance with the recommendations contained in the European Directives in the field of crude oil and petroleum products inventory both the diversification of oil and natural gas supply sources through energy interconnections, as well as the increase of natural gas storage capacity (Popa & Anghel, 2000).

The program for the development of underground natural gas storage has as a priority the intensification of the development of existing capacities as well as the creation of new deposits for the areas facing difficulties in the gas supply, both seasonal daily and hourly, in view of increasing safety in the gas supply of all consumers under unpredictable conditions.

Scientific research with all its components (applicative research, development, innovation) is one of the important factors in the sustainable development of the energy sector.

The main strategic directions for action in this area will be:

• capitalizing on the existing human potential in energy research, ensuring stability and rejuvenation while increasing the level of expertise that allows the correlation of knowledge about global technical developments with nationalization capabilities;

• Creating opportunities to stimulate young specialists to stay in the country and to work in Romanian energy research to contribute to the absorption of European research funds;

• promoting instruments to encourage electricity generation, transmission and distribution companies to finance their own R & D programs and co-finance complex energy research projects;

• Strengthening of a national structure, responsible for the elaboration of the necessary studies for elaboration of energy strategies and policies, for substantiating some decisions in the field, for the coordination and even elaboration of complex development projects at national, regional, cross-border level;

4. CONCLUSIONS

Romania's energy strategy is in line with the political guidelines established at the level of the European Union and contributes to the achievement of the targets set by the European Commission for the whole of the Community states. The strategy ensures the sustainable development of the Romanian energy sector for the period until 2020. The document will periodically undergo adjustments, depending on the technological development, the changes of the strategies established at the level of the European Union and the developments in the national energy market.

The energy strategy ensures that energy prices are maintained at a level correlated with the supportability of consumers in Romania through the rational use of primary national energy sources and by ensuring the functioning of energy markets. Social protection of employees in the energy sector is also an important part of this strategy.

For the proper functioning of the energy sector and its development in line with the provisions of this strategy, it is necessary to create a stable and predictable climate for the legislative and regulatory framework.

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