

ELECTRIC ENERGY MARKET IN CENTRAL AND EASTERN EUROPE - CHALLENGES AND PERSPECTIVES

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Abstract

In the energy sector, each type of fuel used has a number of advantages and disadvantages. The high degree of pollution of power plants based on coal, seasonal instability of hydropower, low efficiency of wind power and environmental disasters that could be caused by nuclear plants has led to sizing each type of fuel, so that the benefits generated by their use to be maximum. At European level, the main objective in energy independence is that the energy mix used by each country to be dominated by increasing energy efficiency - satisfying consumption with minimal financial effort. The principal aim is to minimize the financial effort of the final consumer; this goal can be attained only through the involvement of financial levers of state power. The low level of state involvement in energy efficiency would create huge costs for final consumers, with devastating effects on all market participants. Romania is in a small proportion dependent on external energy resources. Opening new electricity production units is justified only if it aims to increase exports. The lack in takeover and implementation of European legislation in national legislation makes this prospect to remain at the level of aspiration, electricity exports being limited to neighboring countries whose Transport and System Operators have direct connection points.

Keywords: *electricity, green, market, efficiency.*

JEL Classification: F62, F42.

1. INTRODUCTION

Economic and social development at global level are characterized by an increase in energy consumption. Due to the possibility of being easily transported at long distances, but also to the variety of forms that electricity can have, it has always had an important role in the progress of mankind. From a historical perspective, the time that marked the beginning of electricity was 13 September 1882 when Thomas Edison put into operation in New York the first power plant, at which there were connected several tens of subscribers. In the same year, in the cities of Bucharest and Sinaia, a series of palaces began to be illuminated with lamps that used electricity produced by small local power plants.

The first public electric street lighting in Europe was made in 1884 in Timisoara, the first hospital in Europe using electric lighting was Military Hospital in Bucharest in 1885 and the first oil extraction in the world to use electricity was located near Campina in 1897. These examples illustrate that Romanian energy during industrial electricity debut was in full compliance with European energy, but also with the worldwide development.

Electricity production was initially based on conventional fossil fuel. Massive industrialization plans of the communist regime led to the orientation of a source with a higher volume of production and relatively constant one. Thus, since 1970 is was generated the idea of using nuclear fuel, actually put into operation in Romania since 1996. (Bucur & Racoveanu, 2007) As time went by, the general opinion of specialists worldwide was that the use of electricity must be in harmony with the natural environment, global warming putting increasingly more question marks about what kind of world do we leave to our descendants. Thus, green technologies appear in order to produce electricity, which use sun, wave or wind power as "fuel".

Regardless of the type of fuel used, production and development of energy systems are guided through a series of levers by public means of intervention. This is due to the importance of the energy system, which is being a strategic development branch in all countries of the world.

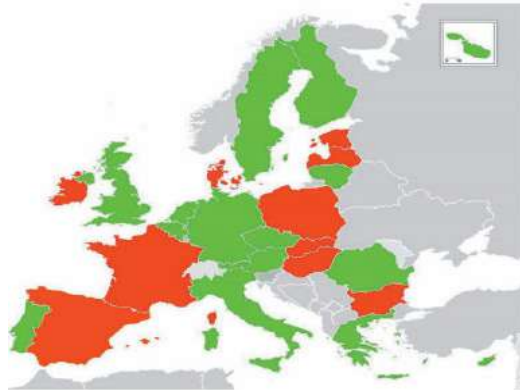
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2. EUROPEAN UNION POLICIES IN ELECTRIC ENERGY

The economic importance of the energy sector determined at European level the assignment of a high attention, being successively analyzed and continuously monitored. Although there are studies and plans for various periods of time, usually for the medium term, they are revalued at least once a year. The difficulty of the European Commission to address certain recommendations is fully justified by a number of factors. The main such factor is that Member States have very different energy mixes. Energy mixes are influenced not only by natural factors, namely the existence and availability of such resources in the territory of certain countries, but also by national policy options, such as the decision of whether or not to use nuclear fuel or shale gas, as well as financial incentives, as in the case of green certificates - state regulated financial incentive to support green energy. Heads of State or Government from the European Union members agreed on a common goal, the so-called objective "20-20-20 until 2020". This objective includes reducing CO₂ emissions by 20%, increase renewable resources which will reach 20% of the total production of energy and 20% increase in energy efficiency; all these objectives are compared with 1990. This target could not be accomplished without a common legislative framework. The purpose of the legislative framework was to unify European energy markets. Returning to the very different energy mix, it can help to unify the supply of all EU states by developing interconnections between infrastructure so that the energy efficiency of each state to be maximal. (Eurostat, 2013)

Along with monitoring and surveillance measures at European level, public policies must take into account the context in which the global energy functions, the European Union being subject to a whole series of challenges. Along with definite dependence on natural gas from Russia, massive exploitation of shale gas in the US led to a lack of demand for coal, which is gradually removed from production and exported to the European Union. Although there are still 5 years to complete 20-20-20 objective, the new framework which includes unconventional sources has led to a relative "sabotage" of it, there are countries whose utilization of coal has increased significantly (France - 16%, Portugal - 38%, Spain - 28% in 2014 compared to 2013). On the other hand, there are states almost independent energetically due to these sources - Estonia covers 90% of its energy needs through gas shale mining. (Roberts, 2008)

Another challenge at European level is related to electricity price stability. All regulations and legislative measures in this sector, in order to be put into practice, require huge costs. Whoever implements the legislative part, final costs are borne by the consumer. Thus, although the general interest was to lower final prices, the necessary measures for the development of the internal electricity market, implementing a free and transparent trading market similar to the stock exchange market, modernization of transport and multiplying interconnections, offering financial support to green energy sector, have made the price of electricity to experience significant growth in the recent years. In terms of price formation mechanism, there are a range of interventionist measures, according to each state national interests, flexibility and level of knowledge of consumers. Along with reducing the level of dependency and following the objectives based on principles of sustainability, full liberalization of this market is one of the biggest challenges the European Union faces in terms of electricity market. The right price is formed on a market in which the supply and the demand of a certain product meet freely, in this case electricity. Reduced storage possibilities of this product determines the fact that besides producers and consumers, there is a whole chain of other market participants, transporters, traders, operators of ancillary services.



- Retail price regulation in electricity
- No regulation of retail price.

Figure 1: Level of price regulation

(Source: Report "Challenges of the energy and energy policy - Contribution Committee meeting of European Council in May 2014)

Another challenges for the European electricity market are the investments. The goals of the European Union regarding the reduction of greenhouse gases occurs on the one hand by investing in green technologies, on the other hand by retrofitting of existing production units. Covering electrical energy needs through renewable sources is yet only a utopia. This is why EU recourses to investments in new technologies, able to capture and store carbon dioxide. In this respect, there are different points of view. On the one hand, it is obvious that, once implemented, these technologies would produce a significant reduction in harmful emissions in the atmosphere, on the other hand it is considered that investments in the development of this technology deflects attention from the search for new renewable resources. Another argument sustains the insecurity of carbon dioxide resources storages in depleted fuel tanks. Until 2015, carbon capture and storage has not been implemented on an industrial scale, but there were several pilot projects. Through the European Economic Recovery Program, the European Commission decided to finance several projects for the development of this new technology. Particularly strict requirements made as a single project - "White Rose" in the UK - to remain viable. Moreover, most of the funding for carbon capture and storage remained unused, European Union taking the decision to not re-allocate funds for this purpose. For now, CCS is in testing stage and needs more investments and studies within a period of time, in which specialist can mark the behavior of CO₂ deposits.

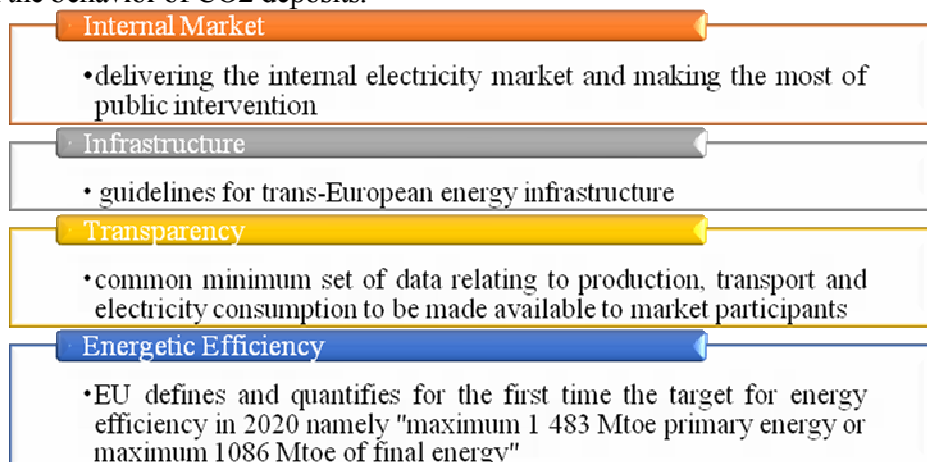


Figure 2: Measures initiated by the European Union in 2014 *(Source: own processing of the information available in the annual report of the National Regulatory Authority Energy 2015 available at <http://www.anre.ro/ro/despre-anre/rapoarte-aniuale> accessed at September 15, 2016)*

As legislative perspectives of development, both economically, but also from a technical standpoint, it can be observed an increasingly punctuality of terms. If the initial draft legislation provided just indicative guidelines, the more closer the deadline for completion of certain projects in the electricity is, the more the terms are punctual and inflexible, or slightly mobile in good margins specified in the regulations of the European Commission.

3. ROMANIAN ELECTRIC ENERGY MARKET

Romania has a wide, but quantitatively reduced amount of primary energy resources, fossils and minerals: oil, gas, coal and uranium, as well as a potentially important renewable resource capitalized. Romania has an energy intensive economy, despite the downward trend manifested globally in recent years. EU legislation in this field is not found in all national legislation and part of the applicable requirements are not fully implemented and enforced. Developing energy services market, especially ESCO (Energy Service Company) and alternative financing mechanisms such as loans at below-market interest, public subsidies, commercial debt financing, are some elements that require development to improve energy efficiency. However, assessing the possibilities of covering the needs of primary energy resources must be based on the current situation of proven reserves, coupled with realistic estimation of potential resources and in close connection with forecasts of resource consumption determined for all users - domestic and industrial.

Dependent in a proportion of 18.60% on external energy resources, Romania is based on the production of electricity mainly on power plants (coal), joined by hydropower, nuclear power plants, hydrocarbon plants and wind farms. Exceeded in terms of energy dependence in the European Union only by Estonia and Denmark Romania uses successfully along with fossil fuel, hydro and nuclear resources to obtain electricity. Hydrological and nuclear resources are also the least expensive in terms of the final price charged for sales. Electricity production varies depending on weather conditions (wind for windfarms, sun for photovoltaic, rainfall and snow for hydro) and depending on the applicable technical standards (eg. the month May of each year is designated alternatively for overhaul of one unit of Cernavoda NPP), consumption also varies depending on the time of year - it is demonstrated that August and December recorded the highest electricity consumption of Romania in a calendar year.

Legal separation of generation, transmission, distribution and supply of electrical activity in Romania was set up by law since 2000. Transelectrica took over all activities of transmission system services and became TSO (Transmission System Operator) of Romania. The company Transelectrica is the Romanian National Transmission System which deals and operates the electricity transmission system and provides electricity exchanges between Romania and its neighbors as part of ENTSO - E (European Network of Transmission and System Operators for Electricity). Transelectrica is part of the largest network area, Continental Europe. This means that the electrical system in Romania is interconnected and operates on the same frequency with more than 20 European countries, with whom Romania can coordinate and collaborate. This is a special interest to us because new national electricity producers, given that Romania ranks third in the EU in terms of energy independence, will target the export of electricity. (Government Decision no. 627 of 13 July 2000)

The electricity market was regulated in Romania in 2000, establishing the trading company Electricity Market Operator - OPCOM, under Government Decision no. 627/2000. OPCOM Company is a subsidiary of National Power Grid - Transelectrica and is totally owned by it. "OPCOM acts as administrator of the electricity market, providing an organized, fair and efficient place to conduct commercial transactions in the wholesale electricity market in terms of consistency, objectivity, independence, fairness, transparency and non-discrimination." OPCOM is a similar market to Bucharest Stock Exchange or to

Sibiu Commodity Exchange, the difference being represented by the object of trading. Electricity Law no. 13/2007 establishes the legal regulations for carrying out activities in the electric field, including power production. The legislative framework establishes the creation of a competitive market. Article 26 of the Act requires that the electricity market to become fully competitive. This article establishes two types of electricity markets regulated and competitive market.

The regulated market will operate up to full liberalization of the electricity market - which did not occur until the year 2015. On regulated market, ANRE (National Regulatory Authority for Energy) will determine all contract prices and quantities associated with transactions between producers and transporters of electricity to final consumers. Electricity is supplied to consumers at regulated prices set by regulated tariffs and according to contracts covered. These regulated prices and contracts consist of a "basket" price for electricity at which there are added the transmission and distribution tariffs. ANRE regulates the amount by which each producer prices should contribute to each such "basket". The electricity market will be gradually liberalized through an increase in the percentage of market competitiveness. Starting with 2010, the Romanian Government approved a fully competitive market. However, in practice, the market remains partly regulated because regulated consumers chose not to change suppliers as higher electricity prices remain in competitive market. Regulated component of the overall market (regulated bilateral contracts market) provides electricity at regulated tariffs for households and non-households who have not used the right to change their providers. Regulated tariff is applied to participants in the centralized electricity markets and seeks proper allocation of costs for the activities of the electricity market operator. The method for establishing regulated tariffs for services provided by the operator is "cost+", regulated revenue representing the sum of total justified costs and reasonable profit share, calculated as a percentage of these costs.

Trading mechanisms on the electricity market are relatively simple. Applications and product offerings can always be recorded (Z-n), here are included all regulated contracts. In Z-1 DAM is situated, when contracts for sale of electricity are concluded, delivery being made the following day Z. Also in Z-1 but later than DAM is situated IDM, the supply and demand unsatisfied in DAM have a new opportunity in IDM (low volume of transactions). In day Z, TSO (transmission system operator) starts to operate, in the case of Romania - Transelectrica, which makes the adjustments of energy required in order to compensate different deviations from the planned production or consumption.

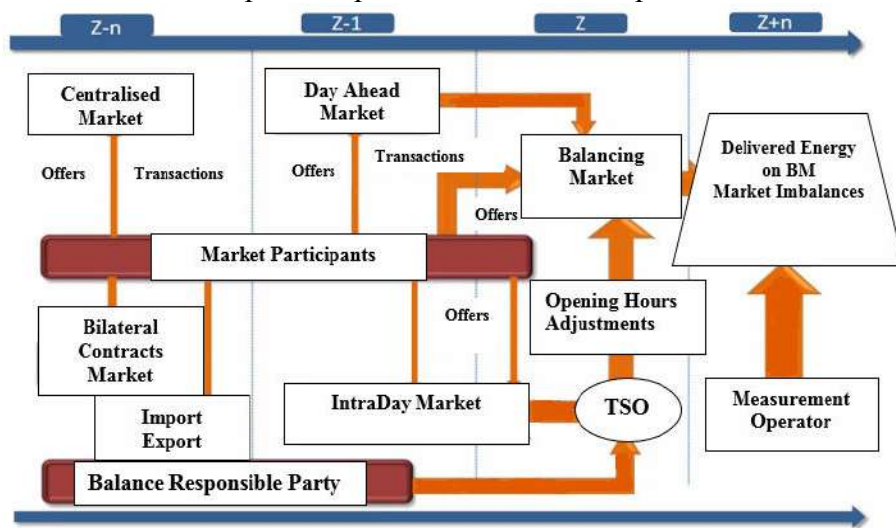


Figure 3: Components of the electricity market in Romania (Source: own processing of the information available at <http://www.anre.ro/en/about-ANRE/annual-reports>, accessed on April 16, 2015)

An important goal in Romanian energy sector is progressive elimination of tariffs based on the fact that, although they are in accordance with the pricing mechanisms in competitive markets, the calculation errors and different price levels, so slippery depending on a number of variables, reduce the fairness and transparency of the correct price of electricity - regulated prices are generally lower. Thus, as of January 2014, based on the schedule to eliminate tariffs, the percentage of purchasing electricity from the competitive market for non-domestic end customers who have spent eligibility is 100% of their consumption and for domestic customers who have not used the eligibility, 20% of their consumption. It is estimated that all consumers will benefit from competitive market prices in 2018.

4. CONCLUSIONS

Electric energy market is simple in terms of mechanisms, but when it comes to development, it becomes complex. Different coloring of the electricity markets of EU member states determine a relative difficulty for the European Commission to adopt legislative measures relating to the use or not of certain fuels or sizing production or consumption from certain types of energy sources. Major guidelines set by the objective 20-20-20 by 2020 draws clear tasks for each member state, these tasks being of utmost generality, leaving a certain degree of discretion for member states. Regardless of the energy mix, increasing energy efficiency, increased production of renewable energy and low carbon dioxide emissions in 2020 compared to 1990 were considered feasible objectives unanimously by all member states.

Considering the fact that the energy system is a strategic branch of national importance and that financial pressure needed to implement these objectives could not be fully supported neither by final consumers nor by private enterprises, the state was practically forced to get involved by taking measures to ensure their fulfillment gradually. Moreover, the European Commission regulations treat convergent all aspects of the electricity market, the main purpose of all being to ensure a near-perfect market, like stock exchanges. High Representatives of the European Union plans to unify member states after the model of US states, is held by small steps, while pursuing a range of issues, in which each of them has economic implications.

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