ELIMINATING THE DISTORSIONS ON THE RENEWABLE ENERGY MARKET

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Abstract: *In Romania, energy transactions are carried out on two markets, the regulated and competitive market, the last one being divided into the wholesale market, retail market and green certificates market.*
Operation of the electricity market in normal conditions was a particular concern in recent years for Romania, who has made notable progress on achieving market liberalization. However, there are certain aspects which show market distortions particularly in renewable energy. To point out how these market distortions behave, the domain of energy in general and renewable energy in particular must point out that they are related to externalities and socio-economic costs connected to alternative technologies.
A paradox in national renewable energy system is that Romania granted substantial subsidies to investors in this area, but most of the time, renewable energy projects do not have funding to be completed. In the following we will emphasize market distorsions in renewable energy in Romania related to the energy market and its specific externalities.

Key words: *energy market, renewable energy market, externalities, market distorsions, measures.*

JEL classification: D4, H23, Q42.

INTRODUCTION

Energy systems have become increasingly important at global level especially in the second half of the twentieth century. Exhaustible resources and dependence on fossil fuels is becoming increasingly aware, from individual consumers to the domestic industry and public authorities and private. There are several issues related to this problem, the most important of which refers to the impact of energy systems on the environment.

Basically, the energy market in general has sought to eliminate barriers to the natural monopoly until recently so that consumers can have the option to choose the buying or supplying energy.

Locally, in Romania, following the model of other states, the relationship with vigorous market can be summarized as follows:

SO ⟷ **PE**

where SO, system operator
and PE is power exchange.

Basically, these two entities are the main players on the energy market especially in trade field. Besides these two main actors, there are also other categories such as TO and DO (transmission/distribution operators), P (producers), C or CS (consumers, which can be domestic, industrial) and Pv (providers) .

In Romania, energy transactions are carried out on two markets, the regulated and competitive market, the last one is divided into the wholesale, retail and green certificates market. Taking into account existing renewables in Romania, the rules mentioned above apply equally to energy from renewable sources.

Operation of the electricity market in normal conditions was a particular concern in recent years to Romania, who has made notable progress on achieving market liberalization. However, there are certain aspects which show market distortions particularly in renewable energy. To point out how these market distortions behave, the domain of energy in general and renewable energy in particular must point out that they are related to externalities and socio-economic costs connected to alternative technologies.

To remove market distortions in renewable energy is necessary the internalization of externalities affecting the economic viability of green energy. Externalities are defined as benefits or costs caused from a product without intention through an economic activity which is not influenced by any interested party and after which no compensation is paid to the problem created.

Regarding renewable energy market distortions in Romania there can be point out failures in the financing of the sector, subsidies allocated improperly, losses from mismanagement of renewable prices inversely proportional to consumer income evolution.

COMPETITIVE ELECTRICITY MARKET MECHANISMS

Energy market consists of: power generators, transmission and distribution network, retailers and consumers. Transmission and distribution forms a regulated monopoly, introducing governmental and social policies.

Manufacturers are more numerous, they are more competitive, and so the energy market tends to be oligopolistic; individual companies can influence the price. Energy must be available on demand, but supply and demand varies continuously; usually it can not be stored and it must be within the parameters required, but a discrepancy between supply and demand induced frequency variations.

Therefore a control agency must manage energy supply and transport routes. If, for example, hydropower plants cannot provide the required amount of energy, the control agency has to buy a more expensive generator to avoid a blackout. In addition, the appearance on the market of intermittent energy sources like wind or solar energy modifies the prices.

They induce excessive volatility in the price and trade substantial risks. The risk associated with trading volume arises when participants cannot estimate the quantities produced and consumed; the manufacturer cannot predict when its production capacity will be exceeded, and the seller can not estimate energy demand. Price tends to have strong oscillations, averages and dispersion variables present seasonal "calendar effect" increased volatility, unusual developments.

From an economic perspective, energy market aims organizational models of energy markets by several criteria such as free market access and competition. Competitive aspect governing energy market mainly defines the following market models:

Table no. 1 - *Competition criterion models of market*

Market models/patterns	**Type model**	**Number of actors involved**	**Competition**
The absolute monopoly	Classic	1 producer, 1 distribution operator	Does not exist
The single buyer	The new Classic	More producers	Only between producers
		1 distribution operator	
The competitive wholesale market	Modern	Lots of producers	Only between producers
		More distribution operators that control several areas	
The retailer's competitive market	Ultra-Modern	Lots of producers, distribution operators	Intense

Source: Author's own contribution according to the classification of market models[1]

In Romania, the liberalization of the energy market has become increasingly important in the last 15 years, considering July 2007, when the market opened fully[2]. In addition to achieving market liberalization, it also took place the activity of licensing electricity suppliers, suppliers that represent the link between producers and consumers.

Even if a consumer has the right to choose his energy supplier, we have to consider other issues such as supplier's ability to provide energy and related services necessary for a consumer. In practice, even today there are not enough electricity providers accredited and interested to sell their product to households. Basically, although domestic consumer has the right to choose his own electricity supplier, this one is not easy to find in the current conditions in Romania. Industrial consumers are targeted by electricity suppliers, they are working in difficult conditions with households because of bureaucratic or procedural reasons.

A very interesting topic related to energy market competition is the criterion that determines the main types of existing markets. The transactions that occur in this area determine two main types of markets:

- The regulated market;
- The competitive market[3].

If agreements that establish the amount of energy supplied and charges are specific for regulated markets, on the competitive market they are established in line with demand and supply. In turn, the competitive market is divided into three sub-markets, the wholesale, retail and green certificates market.

The wholesale market is characterized by the fact that electricity is purchased from manufacturers or suppliers from other vendors for personal use or resale, and network operators to cover their own technological consumption. Wholesale market is divided into four sub-squares, as follows:

- ✓ Bilateral contracts market;
- ✓ Market the next day;
- ✓ Balancing market;
- ✓ Market Ancillary Services[4].

The retail market is characterized by the fact that electricity is purchased by end users or aggregate for their own consumption.

The green certificates market handles the trading of green certificates acts to promote renewable energy that has the mandatory quota system.

SOCIAL ECONOMIC COSTS OF THE RENEWABLE ENERGY MARKET IN ROMANIA

Energy market distortions are related to social economic costs of renewable technologies, such as externalities that affect the functioning of the market to some extent.

In order to observe fluctuations on the energy market, economic theory argues that social and private benefits and social costs or private are not different. Thus, energy consumers would benefit from certain advantages, by extrapolation these benefits would be beneficial to the whole society and the profit energy providers could profit all individuals, whether translate theory mentioned above. Basically, for economic growth and development of the community, it is necessary to light energy market operation

[1] Faculty of Electrical Engineering and Applied Informatics, M. Gabriel, 2009, *Course: Introduction to electricity market*, accessed at http://iota.ee.tuiasi.ro/ ~ mgavril / Pemra / Market% 20and% 20energie % 20electrica.pdf, on April 2nd 2014, pp. 2.

[2] ANRE, HG638 / 2007, *Full market opening of electricity and gas*, accessed at http://www.anre.ro/documente.php?id=274, on April 3rd, 2014.

[3] *Energy and Natural Gas Law*. 123/2012, accessed at http://www.anre.ro/documente.php?id=332, on April 4th, 2014.

[4] Ministry of Economy, 2011, *Elements of energy strategy for 2011-2015*, Bucharest, pp. 12-14.

mechanism, as an example, as the sum of all benefits assessed as consumer and producer surplus.

Price must actually measure the social value of a product, in this case the energy of any kind. If electricity market system in general and renewable energy in particular would be based on perfect competition, the product price would be a result of efficient use of energy resources. But this would be the ideal solution in economic theory.

As a definition, *externalities are costs and benefits that occur when social or economic activities of one group of people have impact over another, when the first group fails to respond at 100 % for impact*[1].

Market mechanism can be influenced dramatically if a good price does not take into account the social economic costs. In the electricity market, although prices are heavily regulated, they do not show the actual social economic costs for goods traded. If the price effect is the benefit, it is a positive externality, but if it is a cost, then it will be called a negative externality.

The energy market in general, the most commonly - encountered are environmental externalities, but the main problem is that they cannot be quantified so as to have estimates of their effects. Although the governments desire to quantify externalities so they can charge through various financial instruments, this is very difficult to implement.

Globally, energy policy is particularly important to integrate externalities especially in terms of renewable energy technologies. The problem of externalities is that they affect energy markets and their distortion. If governments would bear the cost of externalities for conventional electricity, the products should be subsidized in full and it would be an inefficient allocation of resources. Final consumer price would be too low and the cost of pollution would be very large relative to the subsidy. Thus, governments have decided to subsidize renewable energy, but it seems that this measure does not solve seemingly cost of pollution and the consumers who suffer especially because of the energy prices.

As a solution for eliminating distorsions on the energy market, it is considered useful to internalize externalities affecting the economic viability of green energy. Environmental externalities are costs or benefits standalone acting through changes in the environment.

To the extent that the ultimate consumer of these energy products does not pay these environmental costs, it means that the final price of the product is not complete, and the energy resources are not allocated efficiently. The theory supports the need for some form of correction called tax that reflects the social costs charged by the generator externality in question.

Before any action, it is necessary to compare externalities resulting from the exploitation of conventional energy sources with renewable ones for situations that may occur when the externality effect is negative or when renewable sources and technologies leading to high social economic costs are quantified. As steps to assess some energy products in terms of socio-economic costs, we can include:

1. Identifying the products in technical and geographical position to observe the environment and how it can be affected or how the product can help to exploit;
2. Identification of environmental emissions and how they can affect whether or not the parties involved;
3. Identify positive and negative effects and their quantification in real values.

Although social economic costs have quite high values in the classical sources of energy, they are favored at the expense of alternative energy alternatives. If external costs of conventional sources of energy should be placed in the price/MWh produced,

[1] Costel Negrei, 2004, Economic and politics for environment, Chapter II, part 2.5.2., ASE, Bucharest, pp. 15.

renewable energy would certainly balance at payments level. In such situations, the theory says it should be used a form called a tax correction to reflect social costs charged by the generator externality in question.

If the government charges for external costs, these externalities are internalized and the market price of energy from renewable sources will be fair. It is important that the state's intervention has positive effects on consumers and producers/suppliers of energy so that the market remains competitive.

DISTORTIONS ON RENEWABLE ENERGY MARKET IN ROMANIA

Green certificates market distortion consists precisely in subsidizing energy price changes affecting energy producers and suppliers together with final consumers are the ones that are paying the cost.

Renewable energy producers are the beneficiaries of grants in the form of Green certificates, the cost is borne by industrial and household in the monthly electricity bill.

In the following, we shall describe the distorsions on renewable energy market:

1. Financing renewable energy sector is a public decision, borne by all consummers money, which affects attracting private funding and prevent the actual investment in this area. Lack of stability in the political climate and energy legislation does not attract investment in renewable energy and it cannot be permanently supported by the state, especially given the desired liberalization.
2. Environmental externalities and lack of assessment of social economic cost for these externalities create price distortion, preventing its formation as supply-demand ratio.
3. Energy losses are close to one third of consumption, largely because old technologies, building modernized and inefficient transport systems.
4. Electricity prices are considered small compared to the European average, but reflects consumers' monthly bills rather large values especially because markets are not properly regulated, nor liberalized. Another problem with prices is that they grow very quickly and in relation to household income, which hinders their support on medium and long term.
5. Capacity building energy production from renewable sources is only apparent, because the approval documentation for the construction of wind or photovoltaic parks often remain at the paper or feasibility studies, potential investors do not find sources of financing for investment projects. Thus, many potential investors have developed documents which contained connection to the NPS (National Power System), but have not started the actual construction itself. They traded parks as project relying on the connection contract already achieved, while projects that were also built cannot obtain the contract of connection in the NPS.
6. Green energy subsidies are capitalized only through mandatory quota of green certificates. Thus, many investors have been able to benefit from recovering their investments by issuing and selling Green certificates, and they do not want to continue the energy market as operators. In these circumstances, investors who produced green energy and were able to recover the money invested are no longer loyal players in the market, leaving activity and withdrawing money from Romania. Basically, these earnings obtained twice, once by the fact that selling investments at market price and once they got the money invested and received subsidies. They should not receive any grants without certain criteria, such as a commitment to long-term participation in the energy market.
7. Renewable energy market may be effectively developed through the mechanisms of functioning of the electricity market. Thus, although the 2007 witnessing the liberalization of the electricity at 100%, this is not reflected in

reality. This is because long-term contracts negotiated bilaterally outside the exchange at prices below market contracts representing approximately 16TWh, meaning one third from the total transactions[1]. These contracts represent 80% of long-term contracts, which indicates that the electricity market is about 20-25% liberalized.

8. Although the national potential of renewable energy is among the highest in Europe and supported the development of green energy, energy prices did not decrease as expected in relation to the EU average. In 2012, the average price for a MWh is higher by 21% since 2011, the company's average electricity cost of 80 USD / MWh, compared to the EU average of $ 65[2]. This is explained by the fact that in Romania about 35% of the price of electricity is composed of grants, eco-taxes, tariffs and transport infrastructure.

Table no. 7 *Measures to eliminate market distortions for renewable electricity in Romania*

Market distorsions	Corrective measures
Energy price distorted	- Establish a fair price compared to the EU average - Actual liberalization of the market and the price of renewable energy
Faulty market information	- Measures to inform consumers about electricity prices - Informing suppliers about energy related tax changes
Inappropriate subsidies	- Special Conditions and criteria for awarding grants - Determination of investors to have a real, long-term commitment to the investment made
Uncontrolled investment	- Checking the grants and opinions of connection to NPS - Monitoring of investments for a period of at least 5 years after their completion by independent
Bureaucracy	- Removing bureaucratic barriers on renewable energy and related investments
Corruption at the level of authorities	- Prevention and Punishment of corruption at the level of authorities
Social economic costs-Externalities	- Estimate of real external costs and their integration in the final price of traded energy
Mismanagement	- Reorganization of the national energy system - Establish an independent management of existing political structures
Consumer losses	- The investment in technology and modernization of existing equipment - Verification and remedies of consumer losses

Source: Author's own contribution

For Romania, a country with so much potential in terms of renewable resources is important to create an efficient organization to help the national energy system and the actors involved, even the consumers, manufacturers and suppliers. Romania has a

[1]OPCOM, *Reports*, accessed at http://www.opcom.ro/tranzactii_produse/tranzactii_produse.php?lang=ro&id=104, on April 6th 2014.
[2]ANRE, *ANRE Report on the determination of prices and tariffs*, accessed at file:///C:/Users/windows/Downloads/RAP_AN_Tarife&Pret%202012.pdf, on April 6th, 2014.

well established energy infrastructure, but needs upgrading at all levels, after which it could export more energy produced.

Renewable energy market distortions can be corrected so as to assist and create a stable system to benefit from the potential of renewable energy sources available. Application fees relating to externalities and hence their internalization will have positive effects on energy prices and energy market players.

CONCLUSIONS

Energy is a competitive field and increasingly present in the individual consumer, household, industrial, public and private authorities. There are several issues related to this problem from which the most important refers to the impact of energy systems on the environment.

Although social economic costs have quite high values in the classical sources of energy, they are favored at the expense of alternative energy alternatives. Alternative technologies, although they have reduced external costs remain rare on the energy market due to high operating costs. In such situations, the theory says it should be used a form of tax correction to reflect social costs charged by the generator externality in question.

If the government will charge for external costs, these externalities shall be internalized and the market price of energy from renewable sources will be fair.

To remove market distortions in renewable energy it is necessary to crate an internalization of externalities affecting the economic viability of green energy. Externalities are defined as benefits or costs from a product without intention through an economic activity that is not influenced by any interested party and after which no compensation is paid to the problem created.

Romania has a well established energy infrastructure, but needs upgrading related, after which it could export more energy.

Renewable energy market distortions can be corrected so as to assist and create a stable system to benefit from the potential of renewable energy sources available.

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