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THE IMPACT OF THE CHANGES IN THE ROMANIAN ELECTRICITY MARKETS ON THE HOUSEHOLD CONSUMER

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Abstract: *Romania's electricity sector has undergone significant reforms as a result of the country's accession to the EU. The aim of this paper is to assess how the recent changes in the Romanian electricity markets are impacting the household consumer segment. We first provide a brief description of the various modifications observed within the industry over the last few years and then assess, from an energy marketing perspective, how they affect household consumers of electricity. The study is based on secondary research. We conclude that a new and more complex pricing mechanism has emerged and that household consumers have a constrained freedom on the liberalized market.*

Keywords: *Electricity sector, Household consumers, Liberalization*

JEL Classification: *M31, Q41*

INTRODUCTION

Electricity generation capacity is so tightly connected to economic growth that the latter can be used as a proxy to estimate the future growth of the energy sector as a whole and the former can be used to indicate the overall level of development of a country or region (Breeze, 2005). This relationship tends to be universally valid, regardless of the structure of the economy (e.g. mostly agrarian or industrial), since the standard of living is correlated with domestic electricity consumption and this, in turn, represents a significant part of the electricity demand at the national level (Eurostat, 2013). Thus, studying the relationship between the electricity sector and household consumers is useful in understanding some of the

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underlying trends affecting economic growth and the improvement of living standards.

As with all major utilities, during the four and a half decades of communist rule, the electricity sector in Romania functioned as a state run monopoly. The status quo continued until 1998, when the first steps towards reforming the industry were taken. Most energy policies and reforms in Romania were implemented as a result of the country's negotiations to join the EU. Thus, the overall direction of the changes has been to open up the sector to private investors and to liberalize the electricity markets.

The complete liberalization of the industry follows the principles put forth by liberal economists such as Smith, Hayek and Schumpeter, and is generally intended to encourage innovation and, ultimately, benefit the consumers. However, a minimization of state influence over such a strategically significant sector can create security risks. In addition, certain electricity value chain components require prohibitively high investment costs, meaning that only a limited number of companies will be able to enter the market.

Percebois (2008) concludes that market liberalization and interconnections between national electricity grids within Europe has led to an overall increase of retail prices and argues that this may be partly due to the consolidation of European energy companies through mergers and acquisitions across the EU electricity market. Farré et al. (2010) argue that small and medium sized companies are finding it difficult to survive in the presence of large international enterprises. They conclude that the declining number of entities raises serious questions regarding the long term survival of a competitive electricity market in Europe.

Research papers reviewed by Pittman et al. (2008) assess various issues which may arise from applying the same EU model of energy regulation, as seen in the developed economies of Western Europe, in the developing economies of South East Europe. One of the issues discussed is the expected increase in electricity prices, which would be unpopular among household consumers and could even result in "fuel poverty". It is generally concluded that a "one size fits all" approach should be avoided. Instead, great care should be taken in tailoring country specific approaches to liberalization.

Academic research concerning the Romanian electricity sector is limited. The topic of liberalization, privatization and reorganization of certain state owned

energy companies has been addressed by several studies (Diaconu et al., 2009; Haar and Marinescu, 2011; Popovici, 2011). However, the assessment of Romanian household consumers from an energy marketing perspective seems to represent a gap in current research. This is likely due to the low incidence of supplier switching by residential customers up to date. However, it is likely that the combination of changes taking place in the Romanian electricity sector is going to generate more active household customer behavior in the years to come.

The aim of this paper is to assess the impact of the changes in the Romanian electricity markets on the household consumers from an energy marketing perspective. We will first provide a brief description of the various modifications observed within the industry over the last few years and then assess how they affect household consumers of electricity. The study is based on secondary research.

2. CHANGES IN THE ROMANIAN ELECTRICITY SECTOR

Two distinct electricity markets exist in Romania: wholesale and retail. The core purpose of the wholesale market is to provide the context for large electricity transactions, most of which take place between generators, various intermediaries and suppliers. It also includes transactions concerned with the balancing of the national grid and the sale of electricity to certain large scale industrial consumers. The retail market only includes transactions between suppliers and electricity end users, both industrial (commercial) and residential (households).

The aim of this research means that we will focus our analysis mainly on the retail market, looking at the energy mix, the legislative context and the suppliers.

2.1. The evolution of the energy mix

The first change that we will address refers to the energy mix of the Romanian electricity sector. For the purpose of our study, the energy mix refers to the share of various energy sources that are used for electricity production at the national level. In other circumstances, the energy mix could also refer, for example, to the share of primary energy sources used for electricity, transportation and heating within a region.

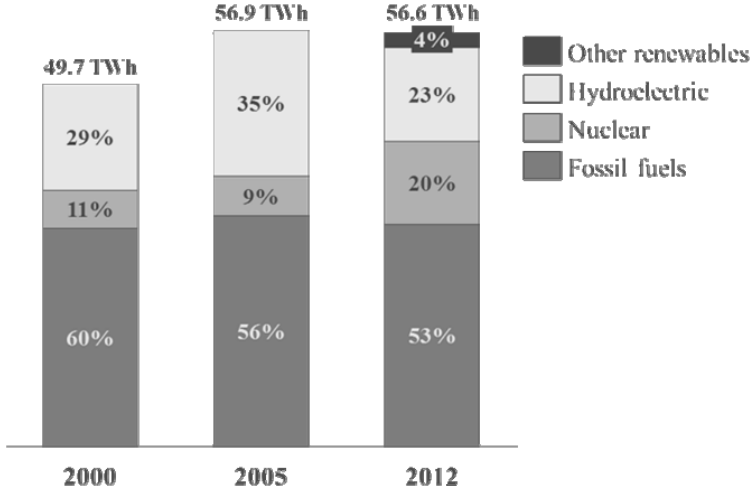

Figure 1 *The energy mix of the Romanian electricity sector*

Sources: calculations based on various data obtained from (ANRE, 2013f; EIA, 2013)

The electricity sector in Romania has evolved over the years to become less carbon intensive and more sustainable. The share of fossil fuels (coal, natural gas and oil) used for electricity generation has been constantly decreasing since 2000. The share of nuclear energy has doubled since the inauguration of the second reactor at the Cernavodă power plant in the second half of 2007. The production of electricity from hydroelectric units has averaged ~25% of the energy mix over the last decade, with fluctuations depending on factors such as drought or fossil fuel prices.

The most significant change in the Romanian energy mix from the perspective of household consumers is the rapid increase over the last few years in renewable energy production from sources other than hydroelectric (see Figure 1). This trend is relevant due to the higher generation cost associated with sources such as solar, wind and biomass. In addition to the rise in the production costs and, implicitly, the retail price of electricity, end users also have to support the costs of the green certificates issued to generators for the production of renewable energy.

It should be noted that small and micro hydroelectric projects also benefit from the green certificate system, but the vast majority of hydro generation capacity in Romania consists of large hydroelectric plants (above 10 MW).

2.2. The new legislative context

As stated in the introduction, the Romanian legislative framework in the field of energy has been significantly revised in order to comply with the standards established at the EU level. There are three key changes that have already had or will soon have an impact on household consumers: industry liberalization, price deregulation and the implementation of support mechanisms for renewable energy.

The liberalization of the energy industry was the most significant reform that the sector has seen since the fall of communism. In 1998 and 2000, a series of laws and governmental decisions signaled the start of the liberalization process. Overall, the reform produced substantial changes within the production-supply value chain and also changed the way in which end users can interact with electricity retailers (ANRE, 2013f).

The first steps in implementing the reform involved the vertically integrated state run monopoly in the electricity sector. The company was first broken up into several companies which were no longer vertically integrated. Most of these entities later went through consolidations, reorganizations and even liquidations and several of them were fully or partially privatized.

The liberalization process also created a legal framework that allowed private investors to set up electricity generation or supply companies (both wholesale and retail). This led to a rapid increase in the number of sellers active on the Romanian electricity markets, a topic which we will discuss in more detail in section 2.3.

Finally, the most significant change from the perspective of the end users was that, starting with June 2007, any entity is allowed to establish an electricity supply contract with the retailer of their choice, as opposed to being a captive customer of a predetermined or default supplier. This process is called supplier switching and it creates new opportunities both for the sellers of electricity and the customers.

Price deregulation is a more recent development among Romanian energy policies and it directly impacts end users. Before it started being implemented, any consumer who had not switched suppliers (thus being served by their default supplier) would purchase electricity at a fixed tariff set by the National Authority for Energy Regulation (ANRE). In the case of households, starting with July 2013, this tariff will be gradually phased out and replaced by a market based tariff, which

is calculated using the average price at which suppliers purchase electricity on the market, to which several standardized costs are added, plus a 2.5% margin over the acquisition price (ANRE, 2012c). The same change also affects commercial and industrial customers, but in their case the phase out process began in September 2012 and will be completed much faster than for households.

Price deregulation is a complementary measure, meant to function in conjunction with the liberalization of the electricity industry. The primary purpose of this change is to create a more competitive market. Regulated tariffs can represent a barrier for supplier switching, due to the risk of market prices rising above the regulated price level. Having a market based tariff means that customers will be able to assess the efficiency of their own supplier and opt for a retailer who offers a more advantageous tariff. Because the new mechanism sets a fixed margin which is calculated based on their cost structure, deregulation also benefits suppliers through the reduction of financial risk (ANRE, 2013e).

The last legislative change which we will discuss is the implementation of a support mechanism for renewable energy, which is based on a tradable green certificate (TGC) system. The legislation which established this mechanism was drafted in 2008, but its implementation was postponed until close to 2012 (ANRE, 2013a) due to objections brought up by the European Commission regarding the potential overcompensation of beneficiaries (ANRE, 2012b).

The system works by awarding a specific number of TGCs to renewable energy generators for every unit of electricity produced and delivered into the grid. These certificates then have to be purchased by suppliers on the TGC market. The acquisition cost is then passed on to the end users. The market price of the TGCs was initially allowed to fluctuate between 27 EUR and 55 EUR. The upper and lower cap of the interval will be adjusted yearly using the Eurozone inflation rate (ANRE, 2012b).

The number of certificates and the time period during which they are awarded is illustrated in Table 1. However, according to a recent report published by ANRE, the number of certificates to be awarded to generators may be reduced by up to 50% in the case of solar energy and between 25% - 35% for small hydro and wind energy (ANRE, 2012b). This is due to estimated overcompensation in spite of the adjustments made according to the recommendations of the European Commission during the drafting stages of the legislation.

Table 1 *The number of green certificates awarded to Romanian generators*

RE source category	***Unit type***	***TGCs awarded per MWh***	***Period (yrs.)***
Hydroelectric (installed capacity ≤ 10 MW)	new (operational after Jan-04)	3 TGCs	15
	restored/upgraded	2 TGCs	10
	other (operating before Jan-04)	0.5 TGCs	3
Wind	*new*	2 TGCs until 2017 1 TGC from 2018	15
	reutilized	2 TGCs until 2017 1 TGC from 2018	7
Geothermal	*new*	2 TGCs	15
Biomass	*new* (all types of bio waste)	2 TGCs	15
	new (from energy crops)	3 TGCs	15
	high efficiency cogeneration	1 extra TGC	15
Fermentation gas (waste /water processing mud)	new	1 TGC	15
Solar	new	6 TGCs	15

Adapted from: (ANRE, 2012b)

The significant impact of TGCs on the retail price of electricity was publicly acknowledged by the Romanian Government, who announced their intention to suspend ~50% of the TGC payments until the beginning of 2017 (Popescu, 2013). Although these measures are likely to discourage investors, they are also expected to limit the electricity price pressure on household consumers.

2.3. The diversification of suppliers

The last change affecting the Romanian electricity markets that we will include in our assessment is the diversification of suppliers. As mentioned in section 2.2, liberalization had a significant impact on the Romanian electricity sector, especially with regard to the entities functioning on the wholesale and retail market. The breakup of the monopoly that RENEL (the vertically integrated state owned electricity utility) had over the industry was only the first stage of the reform. A series of laws and governmental decisions (which also have a normative power in Romania) have created an electricity sector which now also includes entities such as private start-up companies, subsidiaries of large international corporations and former state owned companies which have been partially or completely privatized or publicly listed.

Figure 2 is intended to briefly illustrate the evolution of the Romanian electricity sector from the monopoly which existed up to 1998 to its current structure. As one of the key requirements of liberalization was to eliminate vertical integration, the figure is split according to the four main components of the electricity value chain: generation (or production), transmission (high voltage transportation of electricity), distribution (medium and low voltage transportation of electricity) and supply (wholesale or retail selling of electricity).

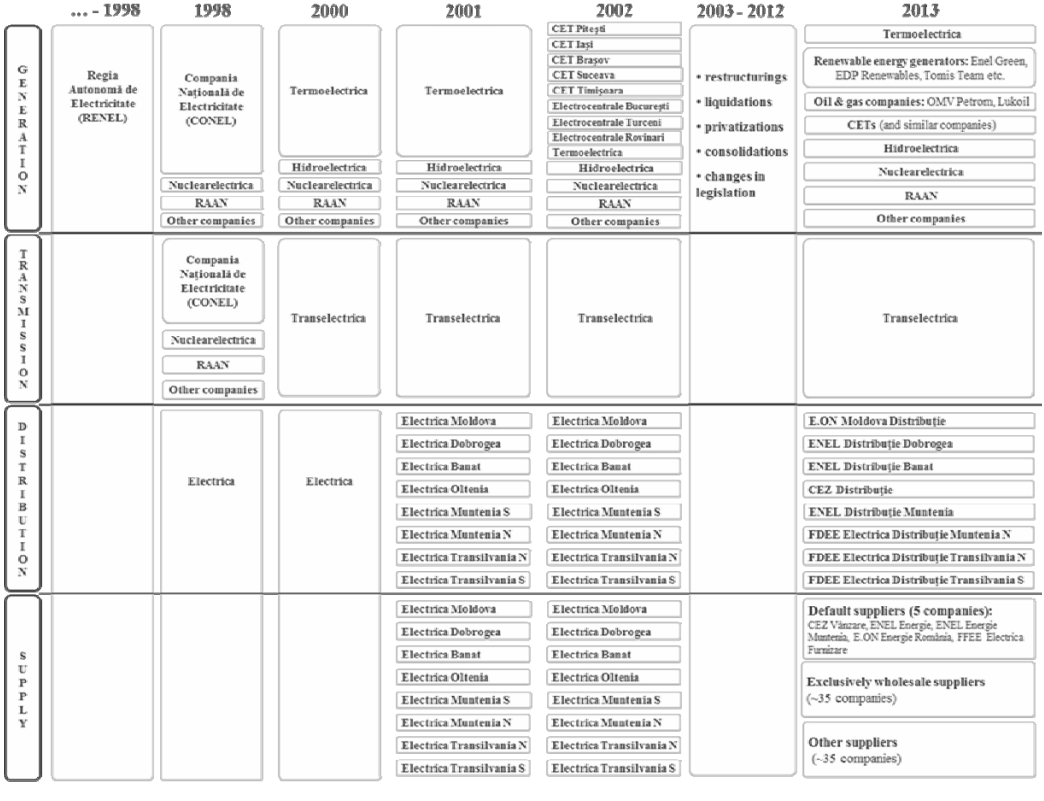

Figure 2 *The breakup of the state monopoly in the Romanian electricity sector*

Sources: (Romanian Government, 1998; 2000; 2001; 2002a; 2002b; 2002c; ANRE, 2013f)

After going through some transitional stages, by 2002 the industry already had a structure similar to the one we see today: several generation companies grouped mainly around the type of fuel they used or the purpose they served (e.g. CETs produce electricity and municipal heating), a single state owned Transmission and System Operator which supervises all electricity transactions and

manages the national grid and eight distribution and supply companies split based on geographical coverage.

By 2013, several private generation companies had also become active on the market. Five of the distribution and supply companies had been privatized. Subsequently, all eight were split into sister entities which covered only one of the two components of the value chain, forming the five default suppliers.

By the end of 2012, the supply component attracted ~70 other private companies, some of which are owned by the international corporations involved in the privatization of the five distribution and supply companies mentioned above. This component of the value chain, with its relatively low investment costs and potential for high gains, now has the largest number of active entities.

The diversification of electricity sellers directly impacts end users by offering them a larger variety of options when choosing to switch suppliers. However, most of these entities will either prefer or will be obligated to serve only the larger commercial and industrial consumers and not residential customers. This issue will be discussed in more detail in section 3.2.

3. IMPACT ON THE HOUSEHOLD CONSUMERS

After documenting and discussing the various changes through which both the Romanian electricity markets and the rest of the industry went, we will attempt to assess the impact that these modifications have or will have on the household consumers (HC). HCs are entities that purchase electricity for residential or domestic use, not for professional, commercial or industrial purposes. All other entities are called Non-household consumers (Non-HC).

3.1. A new pricing paradigm

The first and most visible impact of the documented market changes is the creation of a new and more complex pricing mechanism. Electricity is no longer being retailed at a price level set and occasionally updated by the ANRE. The cost of electricity paid by the end user now depends on a series of factors, such as market prices, the production of renewable energy and the direct negotiation with the retailer. We expect that the direct control that the regulator has over the market will gradually decrease over the following decade up to the point where we will see a fully liberalized retail market with the ANRE serving as its referee.

Regulated electricity tariffs will continue to be relevant for household consumers until the beginning of 2018, when they will have been phased out completely. For this reason, our discussion should take into consideration the number of HCs and Non-HCs who have switched suppliers and thus opted out of the regulated tariff.

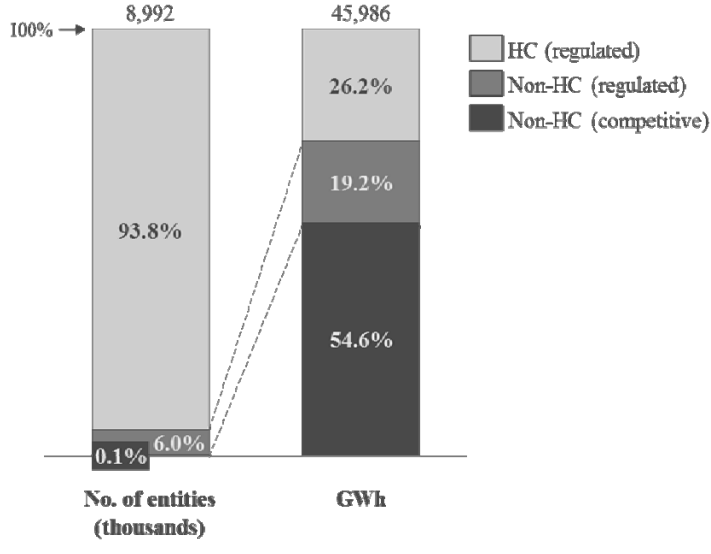

Figure 3 *Regulated tariffs and competitive prices on the retail electricity market*

Source: calculations based on various data obtained from (ANRE, 2013d)

Figure 3 shows that, by the end of 2012, out of the approximately 8.4 million HCs, none had made a supplier switch and were still being sold electricity at regulated tariffs. Only a small percentage of the 0.6 million Non-HCs had switched suppliers and were now buying electricity at competitive pricing levels. However, considering the data illustrated in Figure 3, these Non-HCs, which represent 0.1% of all customers, generate nearly half of the entire retail electricity demand. This means that many of them are likely to be very large industrial customers that were highly interested in negotiating a better price for the electricity they used.

Given that none of the HCs had switched suppliers by the end of 2012 and that a large number of Non-HCs were in a similar position, regulated prices remain relevant for the vast majority (99.9%) of electricity consumers, particularly the HCs. Thus, we sought to assess the evolution of the regulated and competitive prices applicable to households over the last few years.

Given that no HCs are being sold electricity at competitive prices, our comparison uses the price of electricity purchased by small Non-HCs (<20 MWh/year) as a reference point. This category was deemed adequate, considering the estimated annual energy use of a household (OFGEM, 2011). The regulated tariff figure is calculated using the standard monotonous tariff for HCs that was in effect at the start of the year. For 2012 and 2013 we included the cost associated with the renewable energy support mechanism. This was calculated using the methodology and data provided by the regulator (ANRE, 2013g) and the electricity market operator (OPCOM, 2013).

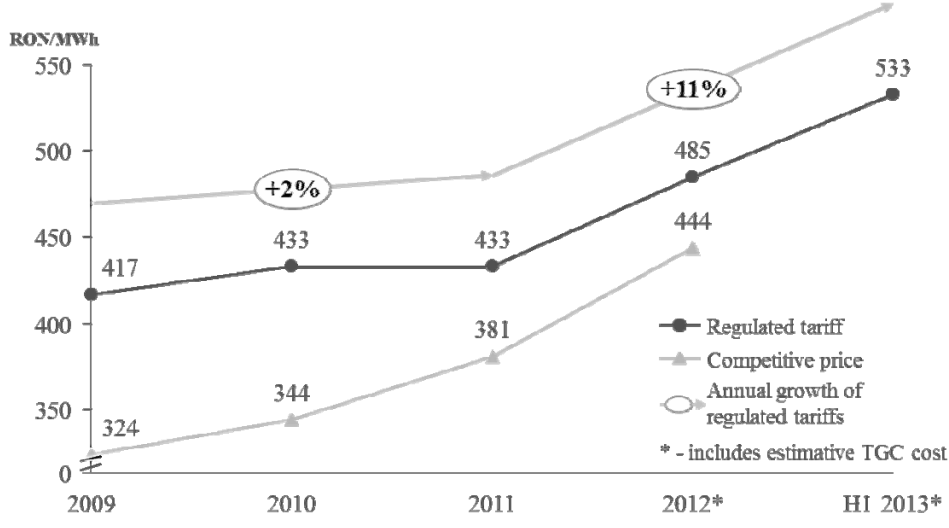

Figure 4 *The evolution of regulated and competitive electricity prices (RON/MWh)*

Sources: calculations based on various data obtained from (ANRE, 2013g; 2013b; 2013c; OPCOM, 2013)

Figure 4 shows that the TGC cost has led to a compound annual growth rate in regulated electricity tariffs of 11%, as opposed to the 2% observed during the period 2009 – 2011. If the cost of green energy were not included in the calculation, the increase would have been ~4% during 2011 – 2013. This translates to a significant impact of TGCs in the household electricity bills.

Over the next few years, as the amount of green electricity produced by Romanian generators increases, so will the overall cost of TGCs. Additional price pressure will result from the deregulation of gas prices and, as we come closer to the establishment of a Single European Energy Market (European Commission,

2013), the alignment tendency between Romanian and EU energy prices. The recently announced rejection of the Nabucco West project is likely to also influence electricity prices indirectly (OMV, 2013).

Thus, the medium to long term forecast shows a continuous increase in electricity prices. A trend in which electricity and gas bills will represent an increasing share of the household budget is likely to have a significant social impact, generating public frustration towards the government and, in some cases, civil unrest (Euronews, 2013). The Romanian Government seems to have taken preemptive actions against such events through planned adjustments of the green energy support mechanism (see section 2.2), planned informational campaigns regarding the liberalization and deregulation of the electricity market (ANRE, 2012a) and, based on personal observations, an increased frequency of public appearances and statements by the minister in charge of energy.

According to consumer behavior models in the field of energy, such as the one proposed by Gamble et al. (2009), the combination of price increases, informational campaigns and price variation among suppliers (as a result of deregulation), is expected to lead to an increase in supplier switching intention of household consumers. However, the fact that the switching intention exists does not necessarily mean that the HC is also able to act on it – an aspect that is discussed in section 3.2.

3.2. The constrained freedom of the liberalized electricity market

Theoretically, the liberalization of the electricity markets, which was completed in 2007, means that all consumers are able to choose the retailer that supplies them with electricity. As seen in Figure 3, by the end of 2012 none of the 8.4 million HCs in Romania had switched electricity suppliers. There is no official statement from the ANRE or the Government that attempts to explain this situation. However, secondary data regarding the Romanian electricity sector and the results of research conducted in other European countries do provide some insights into why HCs seem to lack freedom in the liberalized market.

One issue raised by Salmela and Varho (2006) and von der Fehr and Hansen (2010) is that the limited availability of information, especially with regard to tariff comparison across suppliers acts as a barrier for supplier switching. In addition, the supplier switching procedure is somewhat cumbersome and many HCs are likely

not aware of it (ANRE, 2009; 2011). The bureaucracy involved in switching suppliers may also mean that those HCs who are aware of the procedure, may not be willing to pursue it. These issues could be mitigated through information campaigns and the implementation of a tariff normalization or comparison system.

The more complex issues regarding HC freedom on the market are related to the practical realities of the industry. The regulations regarding the activity of electricity suppliers state that these companies are obligated to read the meters of all customers on a regular basis and report the registered consumption to the distribution companies. However, not all suppliers may have the resources to perform such activities across large numbers of HCs or wide geographical areas.

In order to gain a sense of how the 35 competitive retailers compare to the default electricity suppliers, we performed an assessment of their revenue and number of employees in the year 2011. The revenue is expected to give us a sense of the scale of the company, while the number of employees would suggest the logistical and administrative capacity of the business. The default suppliers will be used as a benchmark for the competitive retailers. The analysis looked at all companies that were primarily classified as retail suppliers of electricity (e.g. large industrial companies that are involved primarily in metallurgy or the supply of natural gas, but also act as electricity suppliers, were excluded from the analysis) – this means that one of the five default suppliers was not included in the analysis because its primary stated activity is the supply of natural gas.

Figure 5 illustrates the top 12 electricity retailers in Romania sorted based on their 2011 revenue. Only supplier S1 had a revenue level comparable to that of default suppliers D1 – D4. S1, S2 and S9 were the only entities that had an employee figure similar to that of D4. Based on this information, we hypothesize that only three retailers out of the 35 currently active on the market could have the capability to compete with the default suppliers in the HC segment.

Figure 3 shows that, on average, Non-HCs purchase over 40 times more electricity than HCs. This means that, even if more retailers would be able to compete with the default suppliers in the HC segment, they would likely not be interested to extend their portfolio with a very large number of low profitability customers. Such a drastic increase in the number of clients would have a significant effect on the company's administrative costs. This would ultimately lead to an increase in sales price to keep up profitability. But the higher prices may cause

customers to opt for a different supplier and the company would stand to lose more than it gained.

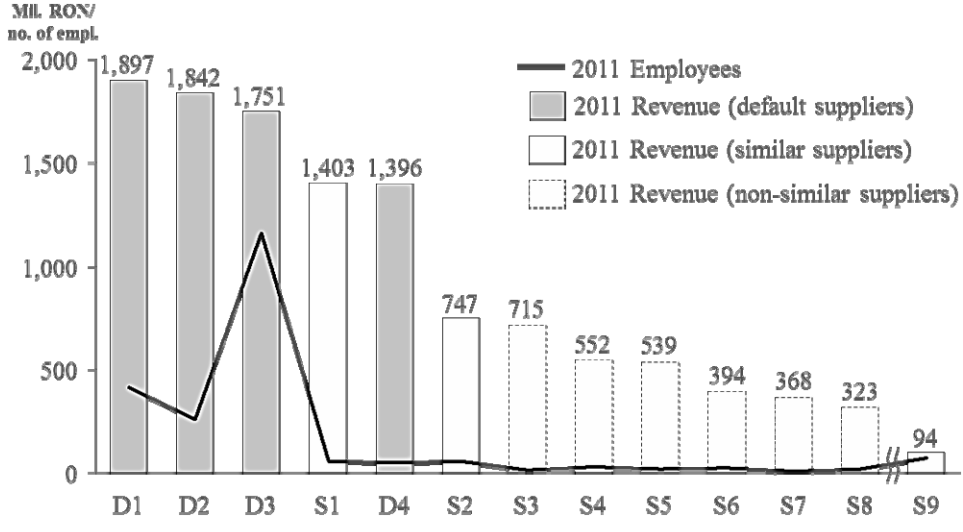

Figure 5 *Comparison of the default and competitive suppliers of electricity*

Source: calculations based on various data obtained from (Ministry of Public Finances, 2013)

The prospect of attracting HCs from different regions of the country may also prove unappealing for large entities such as the default suppliers. This is also due to an increase in administrative and logistical costs (e.g. renting offices and hiring customer support personnel in several new cities, revision or expansion of ERP systems, increased logistical costs due to a wider geographical coverage).

We conclude that the legislative changes regarding the Romanian electricity sector only offer complete freedom of choice to HCs at a theoretical level. The reality on the market shows that, in the future, the main competition in the HC segment will likely be among the five already established default suppliers. If we take into consideration the fact that the same international company has a majority stake in two of them and that another one remains state owned, we expect that the true competition on the HC segment may consist of only three entities. As suggested by Percebois (2008) and Farré et al. (2010) this would reduce the competitiveness of the market and lead to price increases specific to oligopolies.

4. CONCLUSION

This research represents a first attempt to strategically assess the household consumer segment of the Romanian retail electricity market from an energy marketing perspective. Considering that we did not find any similar work during our secondary research and literature review, this study is one of the few or even the first to address the topic of Romanian household consumers in the liberalized market. Given that some of the market changes discussed in the paper have occurred only recently, we believe that this is an emerging research topic that will gain more interest as household consumers will become more active on the retail market.

Our findings can be useful from the perspective of the suppliers, the Government and the consumers. Suppliers can use this type of research to harmonize their own strategies with those used by successful retailers in liberalized markets other than Romania. Governmental decision makers can use the findings in order to create energy policies which are based on the EU guidelines, but are more compatible with the specific context of the Romanian market. Consumers can also benefit from such research by gaining a better understanding of the market mechanisms and of their supplier switching options.

The findings of the research would be better supported and could also be expanded if the study included primary data from interviews with household consumers and representatives of the default and the largest non-default retail suppliers. However, such an approach may be unrealistic, given that the research addresses future business strategies, the details of which are confidential, especially in the context of a market with a relatively low number of competitors.

The potential marketing strategies of the electricity suppliers can constitute a subject of interest for new studies. However, our future research on this topic will also aim to provide a more in-depth understanding of the motivations and the behavior of household consumers.

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