

Analiza španskega trga z električno energijo in predlogi za nadaljnji razvoj

ESTER GETINO, EMILIO GARCÍA & KLEMEN DEŽELAK

Povzetek Električna energija ima dandanes pomembno vlogo pri zagotavljanju varnosti in stabilnosti posameznih držav tako na ekonomskem, kakor tudi na socialnem področju. Na področju energetske liberalizacije je vloga uvedbe trga z električno energijo ključnega pomena. V članku so obravnavani določeni problemi trga z električno energijo v Španiji ter cilji v bližnji prihodnosti. Podobno kot vse članice Evropske Unije se tudi Španija sooča s priporočili in zahtevami s strani Evropske komisije.

Ključne besede: • trg z električno energijo • liberalizacija • Španija • proizvodnja • prenos • razdeljevanje•

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Analysis of the Spanish Electricity Market and Proposals for Future Development

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Abstract Nowadays the electricity is found in any daily activity, while a state can not develop its economic and social potential without a consolidated electricity system. In sense of the liberalized electrical systems, the figure of an electric market becomes fundamental. This paper shows an overview of the Spanish electricity market, involving its problems and future objectives. Spain as a member of the European Union faces the demands proposed by the European Commission. The European challenge is not an individual challenge for individual member but requires the cooperation of all member states, moving towards an energetically integrated European Union.

Keywords: • electricity market • liberalization • Spain • generation • transportation • distribution •

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1 Introduction

The supply of electric energy constitutes a service of general economic interest because economic and human activity can not be understood today without its existence [1]. That is why, the electric sector can be understood as a tool for the economic and social development of a country. This can be seen by analyzing the variation of electricity consumption in the years before and after the economic crisis, as reflected in data on electricity consumption in Spain in 2009, which are 4.7 % lower than the previous years [2].

Since the liberalization of the electricity sector in 1997, this is structured into four major activities: generation, transportation, distribution and commercialization. Of which, generation and retail are carried out under free competition, and transportation and distribution under a natural monopoly. In short, the customer is entitled to a free contract.

One of the factors that has limited economic development in Spain is the scarcity of energy resources and therefore the high foreign dependency from energy, being, according to data of the European Statistical Agency Eurostat, like the second great country of the European Union (EU) with more primary energy dependence from abroad with a total import in the year 2014 of 72.9 % of the energy resources used this year [3].

This fact explains the nature of the Spanish energy mix, composed mostly of nuclear plants (21.8 %) and coal (20.3 %) power plants, as reflected in Fig. 1 [4] conforming an installed power capacity of 101,027 MW.

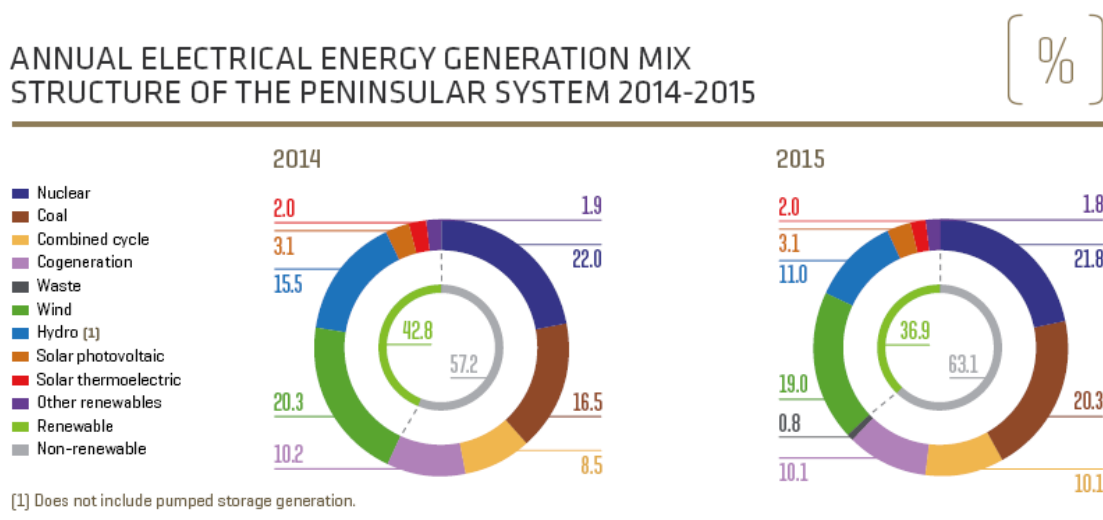


Figure 5.1: Spanish energy mix of the electrical energy generation [4]

In view of Figure 5.1, it is observed that renewable technologies, especially wind and hydro, represent 36.9 % of total energy generation by 2015.

In 2015, electricity demand in Spain reached 262,931 GWh, an increase of 1.9 % over the previous year, with an instantaneous maximum demand of 40,726 MW. This demand came from 63.1 % of the industry, 27.2 % from the services sector and 9.7 % from others such as mining, construction and the primary sector [4].

Due to its geographical location, Spain has interconnections with France, Portugal and Morocco. Figure 5.2 shows the scheduled energy exchanges by interconnection of the year 2015 [4].

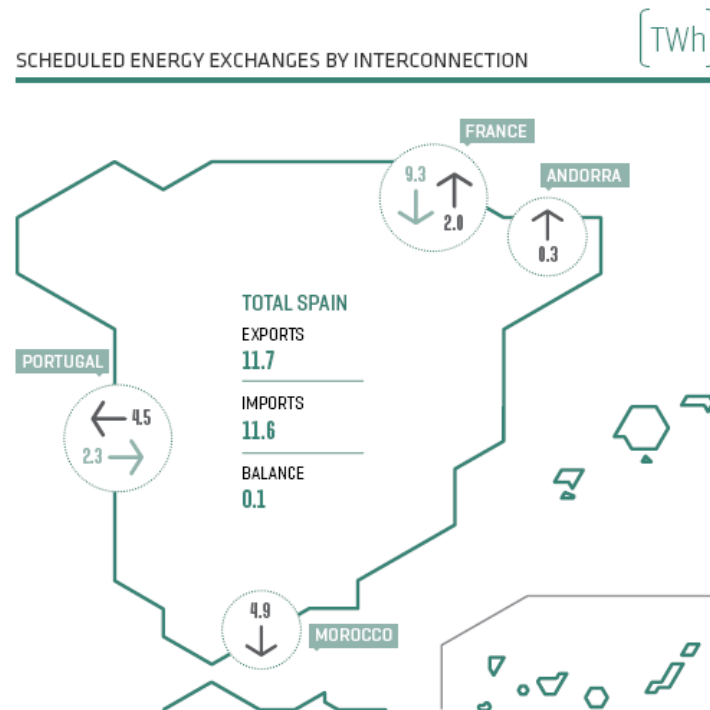


Figure 5.2: International connections of Spanish power system [4]

2 Historical review of the electricity market in Spain

Until 1997, the electricity sector in Spain was a sector regulated by the State, creating in 1944, during the dictatorship, the UNESA Association as a group of 18 electrical companies that represented 80 % of the total production of the sector. This meant the beginning of the unified exploitation, so that the facilities of each company were put at the service of supplying the country's demand, as if it were a single company. In 1951, the Unified Top Rates were approved, which established the unification of electricity prices for the entire Spanish territory. In 1985, Red Eléctrica de España (REE) was created, which involves the nationalization of the transport network [5].

In 1997, Law 54/1997 of the electricity sector was approved, whose basic purpose is to establish the regulation of the electricity sector, differentiating itself with previous laws in which this law is based on the conviction that guaranteeing the electricity supply, its quality and its cost does not require more state intervention than the specific regulation itself supposes [1].

This law therefore implies the liberalization of the sector and the creation of an Electricity Market, giving rise to the current structure of the Spanish electricity sector. This law also creates the figures of the National Energy Commission, the System Operator and the transport network manager (REE) and the Electricity Market Operator (OMEL) .

In Spain, final energy prices in 2011 reached one of the highest levels in the EU, so, final prices for residential domestic consumers reached high values in comparison with neighboring

countries, such as France and Portugal, in the European ranking with a price of electricity 0.195 €/kWh, according to EU statistics, as reflected in the Table 5.1 [6].

Table 5.1: Electricity prices in Euro area in the year 2011 [6]

EU-27 Euro area	Households 2011 [€/kWh]
Belgium	0.214
Bulgaria	0.083
Czech Republic	0.150
Denmark	0.291
Germany	0.253
Estonia	0.097
Ireland	0.190
Greece	0.125
Spain	0.195
France	0.138
Italy	0.201
Cyprus	0.205
Latvia	0.117
Lithuania	0.121
Luxembourg	0.168
Hungary	0.168
Malta	0.170
Netherlands	0.174
Austria	0.199
Poland	0.147
Portugal	0.165
Romania	0.108
Slovenia	0.144
Slovakia	0.168
Finland	0.154
Sweden	0.209
United Kingdom	0.143

The tariff deficit arose; the government recognized fixed costs associated with electric energy, and what was entered in did not cover these fixed expenses. A debt of 10.000 million euros per year is reached, putting in danger of bankruptcy to the electrical system in the year 2013, reason why it publishes the Royal Decree 9/2013 by which urgent measures are adopted to guarantee the financial stability of the electrical system [7]. In this law, the most harmed technologies are those under the special regime (state program of economic incentives to renewable generation proposed in Sapin in the year 1998 in order that renewable energy could compete on equal terms with other technologies), being no longer primacy and adapting to a regime of free competition.

To date, the Spanish electricity system continues to face the tariff deficit, with impact on the final price of electricity for customers.

3 Current situation and operation of the electricity market in Spain

As mentioned above, the Spanish electricity system was liberalized in 1997 giving rise to a regime of free competition both in generation activity and in the commercialization activity. So, we should speak of the Electric Market as a competition free and unregulated market, differentiated into the wholesale and retail markets.

The wholesale market consists of the set of transactions derived from the participation of the market agents in the forward, daily and short-term market sessions. The liberalization of the electricity market establishes the right of free installation of electricity generation, opening the door to any private investor that wants to compete in the generation activity. This activity stopped being compensated by technology, with the elimination of the special regime established for renewable energies, to compete in price in the wholesale market [8]. The Spanish electricity market integrates with the Portuguese electricity market the Iberian Electricity Market (MIBEL) since 2008. Within this group, the Spanish daily market operators (OMIE) and Portuguese (OMIP) are integrated into the forward markets, and the Operators of the system, REE in the Spanish case and REN in Portugal. Within the wholesale market three markets are distinguished:

a) Forward Market

This group belongs to all those markets in which the contract has a delivery time greater than 24 hours.

b) Daily market

It is carried out by OMEL and consists of matching the generation offers with the demand for each of the 24 hours of the following day. This market is characterized by being a marginal market [8], in which all matched generators perceive the same price. This price is determined by the crossing point between the supply and demand curve and reflects the opportunity cost, that is, the revenues that generators give up for not producing, as shown in Figure 5.3 [8].

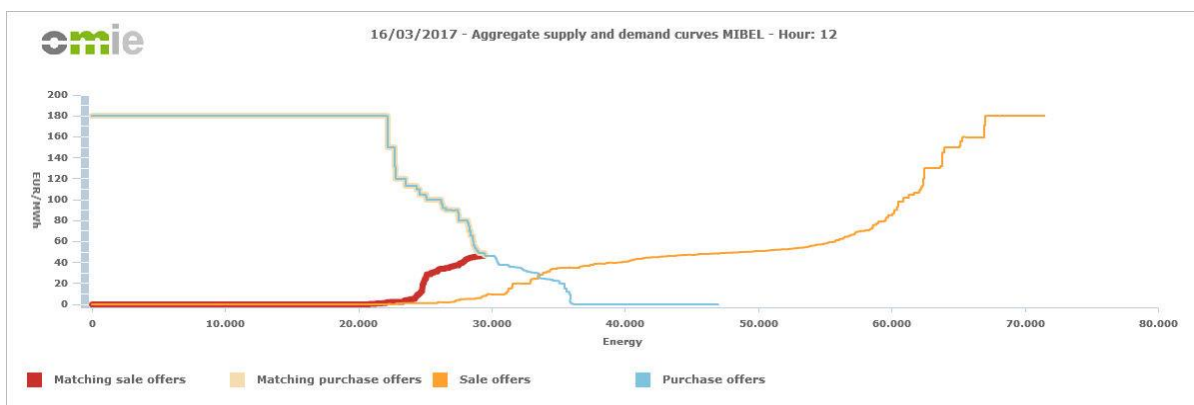


Figure 5.3: Aggregate supply and demand curves for a random day [8]

c) Short term markets

They are characterized to take place during the day of the dispatch.

Within the retail market is the sales activity, which consists of the delivery of energy to the final customers in exchange for an economic consideration. In Spain, this activity is exercised by mercantile companies under a competition regime. These companies acquire energy in the wholesale market and deliver it to the final consumer by hiring and paying tolls for access to the transmission and distribution networks, which subsequently have an impact on the consumer's electric bill. These grid fees are regulated by the Ministry of Industry, Energy and Tourism [5].

4 Problems and proposals for the electricity market in Spain

The main problem currently facing the Spanish electricity sector is the eradication of the tariff deficit, which as mentioned above has placed Spain in the highest positions in the ranking of EU electricity prices [6], [9].

Currently, thanks to measures taken by the government, such as the application of a stable, objective and transparent remuneration to regulated activities, resulting from a valuation of standard projects applied to generation through renewable energy sources, cogeneration and waste; transport and distribution and operation of the system, as well as measures to reduce the cost of generation in non-mainland electric systems and the revision of energy planning, have allowed the tariff deficit to be (consequently) reduced for the first time in 2015 [10].

In this situation, although to a lesser extent, other EU countries especially affected by the economic crises such as Portugal, France, Greece, Bulgaria, Malta and Romania are facing to the same problem [11]; (countries with a delicate economic situation could suffer the higher tariff deficit as explained in the reference [10], [11].).

The European Commission (EC) says in its technical reports that a high percentage of renewables increases the probability of a tariff deficit, because their support, in the majority of cases, have shown to be (very) expensive [10]. Despite these results, Spain faces compliance with the EU Horizon 2020 strategic plan, which is based on increasing renewable generation in member countries. In a country like Spain where more than 38 % of national energy coverage comes from non-renewable sources and with the weight of the economic crisis behind them, the Spanish electricity system faces a new challenge in which to achieve the objectives of the European program with the improvement of the current financial situation [12].

The possible future development facing both Spain and the EU is the integration of a single European electricity market. This is a complex task since each member state is part of a different situation and with different rules for its electricity market. However, this may be the solution to be able to incorporate non-manageable renewable energy into European electricity systems, due to the variability in renewable generation and the difficulty to predict their availability [13].

5 Conclusions

The liberalization of the electricity sector in Spain led to the creation of the electricity market and the benefits of an unregulated free competition regime. However, despite being one of the major advances in the sector, some research has shown a sharp change in the liberalization process as an influential factor in the financial instability of the current system. Spain must continue betting on renewable energy generation together with the incorporation of measures that allow the reduction of the tariff deficit, approaching the European objectives of Horizon

2020. The increase in research and development investments in the sector is one of the greatest challenges facing Spain in the future years.

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