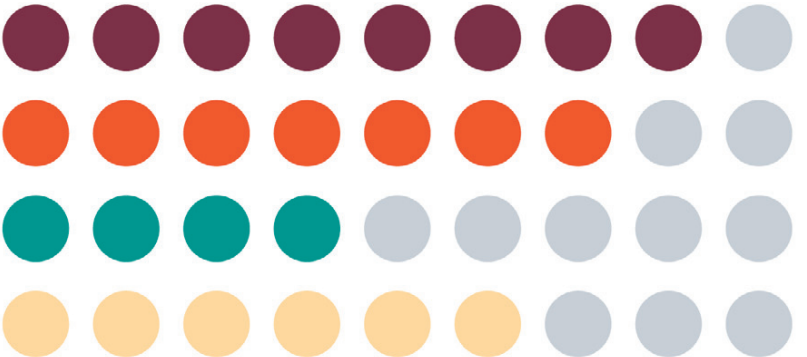
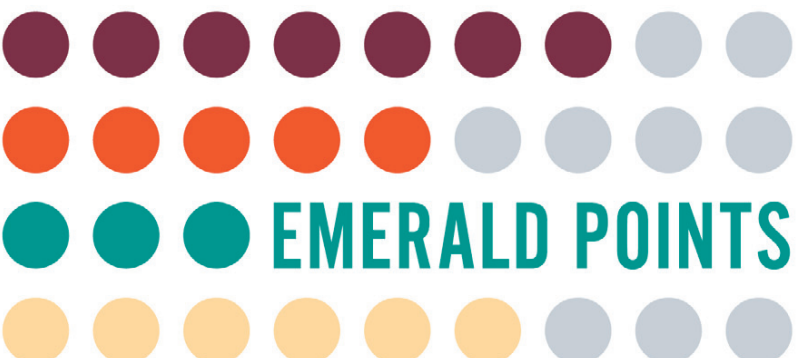


CHANGES IN EUROPEAN ENERGY MARKETS

What the Evidence Tells Us

Felicetta Iovino and Nicholas Tsitsianis



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1

THE EUROPEAN ENERGY MARKETS: THE LIBERALIZATION PROCESSES*

1.1 INTRODUCTION

The European Union (EU) was a project that started after the end of World War II and the forerunners at that time had one simple goal in their minds: to reinforce the co-operation amongst European States and consolidate this co-operation in different aspects of economic, social and political fields. The starting point for achieving this goal was the economic integration and the latter subsequently would lead to political integration. The foundations were laid in 1951 when the

* The chapter is a result of a collaborative work. Nevertheless, it's possible to attribute to Felicetta Iovino the following paragraphs: First Package; Second Package; Fourth Package; United Kingdom; France; Spain; Characteristics of European retail markets; Electricity and gas companies in the main European countries; the other paragraphs: Introduction; Third Package; The liberalization processes in the European countries; Germany; Electricity companies in the European countries: an overview; Gas companies in the European countries: an overview, are of Nicholas Tsitsianis.

European Coal and Steel Community (ECSC) was established. The latter is seen as the foundational pillar of the European integration. The ECSC objectives were clear and it was hailed as the stepping stone which could progressively lead towards a '*European Federation*'. Steadily, every industry was integrated into the common market and at the 1990s, it was natural gas and electricity's turn to join the common market. Hence, state monopolies have started to compete with private enterprises across the EU in a process which is known as liberalization. The aim of liberalization is straightforward: contributing to ensuring co-operation across Europe by establishing a common European market for electricity and natural gas that would enable any consumer to buy electricity and gas from any producer, wherever they are within the EU (Iovino, 2012; Iovino, 2015). This premise is grounded on microeconomic theory which postulates that competition and the profit promote internal (production) and external (market) efficiency, and the efficiency is transferred to customers and the economy in the form of lower prices and costs. The European electricity and gas market liberalization represents the world's most extensive cross-jurisdiction reform of the electricity and gas sector involving integration of distinct state-level or national markets (Jamasb & Pollitt, 2005).

The first European directives had the merit of setting themselves ambitious goals by radically transforming a sector that in most European countries was linked to a single national operator. In fact, the majority of these countries had state-owned companies, such as Italy and France, others like Spain and Germany mainly public, and others like the UK with private operators before the advent of the first directive. The objective was the complete restructuring of the sector by intervening on all phases of the energy supply chain.

The greatest transformation was certainly the complete opening of the phases of generation and sale of energy, both

on the demand and on the supply side. In fact, a majority of new operators has been able to access these phases by operating in a regime of free competition between them. On the demand side, the complete freedom of choice has progressively been realized for consumers, both households and companies of their energy supplier. The declared objectives of these main interventions were the improvement of the service for the customers and a progressive reduction of the prices of the energy service. All this is made possible precisely by virtue of the competition among the many and diverse new operators present in the market.

The opening of the generation and sales phases was possible as these phases have technical-economic characteristics that allow the presence of more operators. In fact, these are phases not characterized by natural monopoly unlike the distribution and transmission phases. The distribution and transmission phases are best and efficiently served by a single operator which takes advantage of the economies of scales. Furthermore, a fragmented and privatized grid system may not be willing to undertake the significant sunk costs involved in the process of distribution and transmission phases and to an extent has not been recommended by the directives of the EU given its strategic and integral importance of such system for each member state. The transmission network also has another dimension, the so-called network externalities. Network externalities can be described as investments benefit all the stakeholders and parties with vested interests by increasing reliability and security and reducing the cost of generation. Network externalities may result in the additional value of investments in grid augmentation being reduced by successive investments. This may discourage investment if the grid was operated privately. Hence, it comes as a no surprise the spirit of the *Third Energy Package* which postulated the segregation of energy supply and generation from the

operation of transmission networks (unbundling), the establishment and the independence of national energy regulators, and retail markets. The *Third Energy Package* also established the Agency for the Cooperation of Energy Regulators (ACER) to help national regulators work together. As a matter of fact, the presence of a single state organization operating under monopoly structure with vertical lineage of operations for all the phases of the energy supply chain is lost.

In fact, the spirit of reforming the energy markets (unbundling) dictated the introduction of newcomers into the market alongside the incumbent. It was always the case that the former monopolist was the first entity to be privatized followed by the unbundling of the energy supply chain.

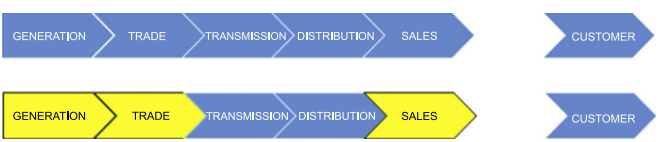
As Table 1.1 shows, the governments have stopped exercising direct control over the industry which is now privatized and at the same time, it has exercised more indirect control by designing a new market structure, implementing it through the law and installing a regulator with a far-reaching authority to intervene in the privatized electricity and gas industry. Companies that combined different functions were unbundled where possible, so that each function would have to be performed by an independent company and made available to all other companies on the market. Entry of new companies was stimulated, which means the different functions in the supply chain are now performed by more than one company at the same time.

The energy sector reform or the liberalization of the electricity market entail the unbundling of the Vertically Integrated Entity as shown in the top panel of Fig. 1.1. Liberalization means the unbundling of the value chain into independent entities, distinguishing between competitive parts (such as production, trade and sales) and network-related activities (transmission and distribution), which are natural monopolies, subject to sector-specific regulation.

Table 1.1. Main Phases of the Energy Sector Reform.

Restructuring	• Vertical unbundling of generation, transmission, distribution and supply activities • Horizontal splitting of generation and supply
Competition and markets	• Wholesale market and retail competition • Allowing new entry into generation and supply • Allowed the entry of final consumers in the markets, for the generation, distribution, storage and supply of electricity
Regulatory	• Establishing independent European, regional and national regulators • Provision of third-party network access • Incentive regulation of transmission/distribution networks
Property	• Allowing new private actors • Privatizing the existing publicly owned businesses

Source: Our elaboration from Jamasb and Pollitt (2006).



Source: Our elaboration.

Fig. 1.1. Electricity Value Chain before and after Liberalization.

The individual elements of the value chain can be described as follows: Electricity ***generation*** refers to the conversion of primary energy, such as fossil fuels or solar energy, to electric power. The generated electricity is then being ***traded*** in the wholesale market, which comprises electricity producers,

Source: Our elaboration.

Fig. 1.2. Natural Gas Value Chain before and after Liberalization.

retailers and financial intermediaries, but also large industrial consumers. In this market, retailers buy electricity from producers in order to resell it to final consumers. The next step is transport of electricity via ***transmission*** and ***distribution*** networks. Transmission refers to long-distance transmission of high voltage power, connecting generation facilities to points of consumption, whereas distribution networks supply electricity to final consumers.

The gas market followed the same pattern. The changes implemented by European governments changed the industry from a supply chain run by a single authority into a complex system of multiple autonomous decision makers. The gas market, however, entails a fundamental difference compared to the electricity market. Unlike electricity, the gas is not generated in the EU, but imported and stored. Hence the value chain is somewhat different but from the point and storage and beyond the gas follows the same pathway as the electricity one (Fig. 1.2).

1.1.1 First Energy Package

The EU formally adopted a Directive on the internal market for electricity (**EC 96/92**) on 19 December 1996. EU member states, with some exceptions (Ireland, Belgium and Greece were given up to two years extension), incorporated the

Directive into their national laws by 19 February 1999. The EU Gas Directive (**EC 98/30**) formally issued by the EU on 22 June 1998 and subsequently became part of the national laws for each member state (as early as 10 August 1998). The member states were given a period of two years (up to 10 August 2000) to comply with the essence of the Ga Directive and align their respective laws, regulations and administration processes accordingly.

Both directives postulated that increasing shares of electricity and gas markets must be opened to competition, based on size of user. The effect of directives had a profound effect on the large markets at least. The effects, however, were more pronounced for the electricity sector: For example, in 1999, the group of largest users, accounting for at least 26% of the electricity market had a choice of supplier (IEA, 2001). In other words, the largest customers representing about 1/3 of demand could choose their retail supplier (Table 1.2).

Table 1.2. Eligible Electricity Consumers during First Package.

Date	% of the National Market Open to Competition (Consumption of Eligible Consumers Relative to National Electricity Consumption)	Minimum Size of Eligible Consumers (EU Average) GWh per Year
Feb-99	26	40
Feb-00	30	20
Feb-03	35	9

Source: International Energy Agency (2001).

Note that not all the countries have opened their energy market at once. Initially (August 1999), there was a considerable market opening in Finland, Germany, Sweden and the UK. The First Energy Package has made profound provisions regarding the access of the companies to the grid. Access to the grid is via a Transmission System Operator (TSO). TSO must be legally separated and must be in the form of a separate legal entity from both generation and distribution of energy. The TSO must be solely responsible for the management, maintenance and development of the network. Furthermore, it must be independent of other activities, such as generation and distribution at least with an accounting type unbundling. Usually the TSO remains under the control and ownership of the incumbent utility. Furthermore, this operator must guarantee the access of all producers and retailers under non-discriminatory conditions. This is the TPA (Third Party Access) system. Under regulated TPA, tariffs are regulated, published and available to all parties. In this sense, the directive provided for three possible options: (1) regulated TPA, in which access took place at public prices defined by the TSO; (2) negotiated TPA, in which customers can negotiate the relative price of access; (3) the Single Buyer, in which the electricity is purchased by the system operator. The EC 96/92 directive offered a number of options as a means of encouraging reluctant states (such as France) to enact their liberalization process. Individual EU member states were free to adopt the more competitive arrangements more quickly and indeed to go further than the minimum required by the directive (such as giving all customers free choice of retail supplier which happened in the UK in 1999).

Although both Directives entail important requirements (security of supply, fair pricing, regulation consumer and environmental protection) that may delay or affect the development of open markets, their objective is the creation of