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# The Spanish Electricity Sector in 2004

## 1. Introduction

Energy is a key input in every economy, both for the productive sector and for final consumers. Energy is at the heart of a country's economy and the welfare of its citizens. There is a close relationship between a society's energy consumption and its welfare.

Energy must be extracted from some resource or substance where it is stored, either directly or though a chemical of physical reaction. These stored reserves are called energy sources, and their utilization depends on technological and economic criteria. Energy sources can be renewable (provided by nature in unlimited quantities) or non-renewable (found in nature in limited quantities).

Electricity is the most widely used form of energy. As opposed to other forms of energy (for example, energy from combustion motors in vehicles) it can be transported and used in a different place from where the extraction process took place. It can be produced using different technologies[1]. In Spain, the most widely used sources in 2004 were coal, oil



[1] Electricity is produced when the combustion of fossil fuels, the heat from nuclear reactions, or natural forces produce movement inside a magnetic field. The electricity can then be transported for use anywhere else. Geothermal power plants use the steam generated when water enters high temperature zones underground to move turbines that produce electricity. Coal and nuclear power plants use the heat from chemical or nuclear reactions to turn water into steam that moves turbines. Gas turbines use gas combustion directly without the need to produce steam; combined cycle gas turbines (CCGT) use both systems, direct combustion of gas and movement from hot steam. Wind plants use wind to move the turbines, and hydroelectric plants use energy from stored water to move turbines.

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derivatives, gas and uranium, as well as hydroelectricity, and renewable sources such as wind, the sun and biomass (**Exhibits 1** and **2**).

## 2. Activities Within the Sector

In 2004, the Spanish electricity sector included generation, transmission, distribution and commercialization activities.

Since electricity cannot be stored, companies needed to plan their investments and operations to match supply and demand at any point in time. That implied large investments, making the sector very capital intensive. In addition, the technical and economic characteristics of the industry, as well as the social role of energy in an economy, made it a regulated environment.

### 2.1. Generation

Generation is the process through which an energy source is transformed by a specific technology into electricity. Generation companies had to build, operate and maintain generation plants while competing in a market that was being progressively liberalized. Some companies operated under a special regime designed to improve environmental quality that offered advantages to renewable energy sources. Entry to the industry was complicated by the market power of incumbents and the huge investments needed to produce electricity economically. The size of the investment as well as the payback period depended on the type of energy being used.

### 2.2. Transmission

Transmission refers to the transportation of electricity from production centers through a high-tension distribution network. This function also encompasses building, maintenance and operation of the network facilities. In Spain in 2004, transmission was done by a state-owned company, Red Eléctrica de España, REE. REE operated the system coordinating generation and final transmission, guaranteeing continuity and safety of supply. In addition, it managed the regulatory traffic with non-Spanish systems (France, Portugal and Morocco).

### 2.3. Distribution

Distribution companies owned and operated low, medium and high tension networks, with activity and revenues regulated. They could only buy or sell electricity to their customers in the regulated market, rather than the free market. Those companies were responsible for the planning, construction, maintenance and management of the networks. They took electricity to the end consumers and operated all other aspects of the sale. Tariffs were regulated for distributors' customers.

### 2.4. Commercialization

Commercialization companies sold energy to customers for which tariffs were not regulated. They operated in a framework of free competition and their activity was independent of distribution. Their main functions included the purchase of electricity from producers or other qualified agents, the negotiation of supply agreements with eligible customers and the fulfillment process.

## 3. Key Players

The sector was composed of regulators, system operators, generation, transmission, distribution and commercialization companies and professional associations.

### 3.1. Regulators

The Spanish State Administration set the guidelines for the electricity sector and regulated the production market. In addition it established the basic legal framework for generation, transmission, distribution and commercialization, determining the minimum quality and supply requisites.

### 3.2. Operators

REE was the system operator, responsible for the technical management of the system and guaranteeing the continuity and safety of the supply. It also coordinated the production and transmission systems.

The Operadora del Mercado Español de Electricidad (OMEL) was the market operator, responsible for the economic management of the electrical system. It managed the market where electricity was bought and sold and performed the fulfillment of the purchase agreements.

### 3.3. Endesa

Endesa was the largest electricity company in Spain, with international activities in Italy, other European countries and Latin America. In addition to traditional generation activities, it also had a strong presence in natural gas, renewable energies and telecommunications. Its operational subsidiaries included generation, distribution and commercialization activities.

Endesa's generation business had a 37 per cent share of the installed capacity in Spain. It used mainly nuclear, coal and hydroelectric energy sources. It had a mere 16 per cent of the market share of renewable energies. Its distribution activities covered most of Spain, with over ten million customers. Endesa had a market share of 44 per cent in clients with regulated tariffs and 36 per cent in clients with liberalized tariffs (mainly in the automotive and chemicals sectors).