

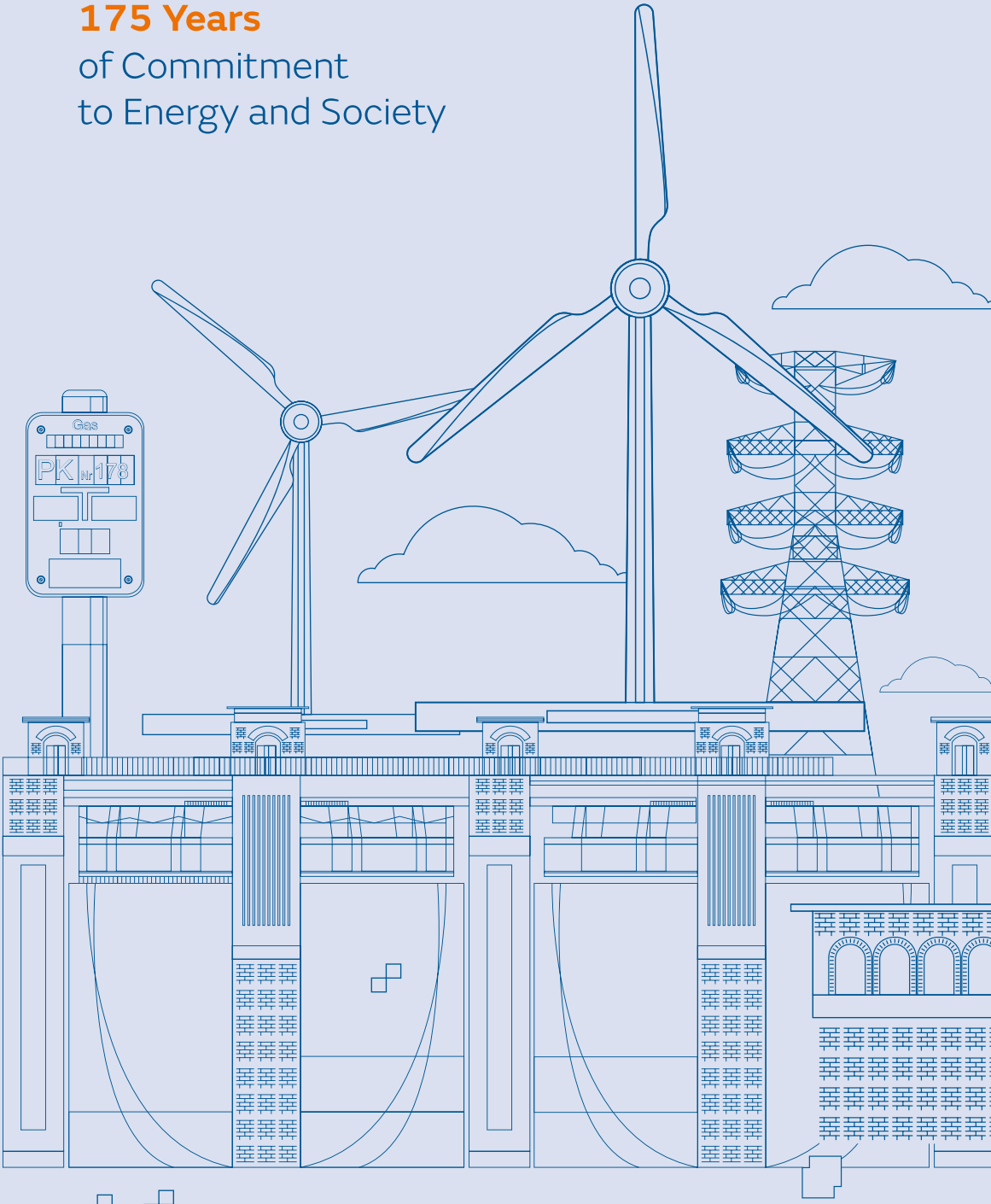
175

1843
2018

years full of history
and energy

Naturgy 

175 Years
of Commitment
to Energy and Society



Naturgy

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of Commitment
to Energy
and Society

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Production: Editorial Planeta, 2018
Legal deposit: B-20.519-2018
Printed by: Liberdúplex

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to Energy
and Society

Pere-A. Fàbregas

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Foreword

The year 1843. A call from the Barcelona City Council to modernize urban lighting and reduce its cost. A group of enterprising people. And six million *reales de vellón* (about nine thousand euros). Thus was born the Sociedad Catalana para el Alumbrado por Gas, with an expectation of 20 years of life and which this year, 2018, has reached its 175th anniversary.

Naturgy's story is the story of a "character," in the words of the author of this business biography. Our company is one of the main protagonists of the evolution of energy not only in Spain, but also in many other countries where we have brought technological advances that have improved the lives of millions of people, have contributed to the competitiveness of thousands of companies, and have fostered the well-being and economic growth of diverse societies on the five continents.

Perhaps because it was born competing to win a contest, the company has grown with the Darwinian perspective imprinted on its character. It has evolved and has been transformed throughout its vital trajectory to respond to what its clients, and society in general, have demanded of it. It has diversified its energy technologies, its businesses, its presence in the world, in order to compete successfully in each new environment. And all this, in order to adapt to each moment, to each country in which it has left its mark. In short, to meet the requirements and needs of people, who are the ones who truly give meaning to any business organization.

And I am not just referring to the people to whom we offer our energy and services, but to all those who have made it possible for Naturgy to be what it is today: from its first promoter, Charles Lebon, and the first capitalist partners, the Gil family; through the imprint of Pere Duran Farell, the visionary engineer who contributed to modernizing Spanish industry and gave definitive impetus to the

company during his presidency; to the thousands of employees who, coming from the dozens of companies that have been integrated into our group, have made it into one of the world's important organizations in the current global energy scene.

Our world is evolving at a rapid pace and energy, just as it was in the industrial revolution that preceded our company, continues to play a major role in the changes we are experiencing.

In 1843, the world population reached 1.2 billion people and by 2050 the world will be home to more than 10 billion people. They will all need and want energy, and it will play a fundamental role in the way we relate to each other and how we organize society.

In this scenario, the innovative spirit that gave rise to Naturgy remains intact in the face of future challenges related to renewable energies and sustainable mobility, precisely at a time of transformation for the company, which this year has launched a new brand and has presented a new Strategic Plan whose main objective is to remain a relevant and lasting player.

For all of these reasons, and at this point in our history, it is important that we remember how we have managed to be this "character", in what context we have grown, what our achievements have been and how we have contributed, in a responsible and sustainable manner, to the development of our society.

Aristotle stated that "thanks to memory, men are given what is known as experience". With this book, we not only want to celebrate the 175th anniversary of the company, but also to contribute to keeping Naturgy's memory alive, as a legacy of an inimitable experience and as an incentive to continue building a great company, a better society and a hopeful future.

Francisco Reynés Massanet

Chairman and CEO of Naturgy

Introduction

A company's history is not solely economic history, nor strictly contemporary history. It is the history of a vision developed by people with a clear capacity for leadership, which becomes an effective strategy and makes possible the orientation of an organization and the use of certain structures towards the construction of a future in which society is transformed towards new realities.¹ This requires teams, technologies and markets, but also the provision of policy frameworks and cultural parameters for different environments.

It is important not to limit one's focus on quantitative aspects, despite their undoubted significance; the spirit is that of people who, at certain times, along with selected teams, and because the conditions of different environments allow them, are able to move forward, build, find solutions. Knowing these people, these moments, these environments and these dynamics will enable us to explain and understand the results achieved. In short, special emphasis must be placed on contextualizing what has happened over the years.

When Alfred Chandler created the world's first chair in business history at Harvard Business School in 1971, he began the journey of assessing the life of companies in society; his famous quandary over which should come first, strategy or structure, was simply fundamental. The reflection involved choosing whether companies should do what they could with the structures available, which was the current option at the time, or whether they should think freely, within their strategic vision, deploying all their possibilities, and then build the necessary structures to achieve the desired results. In sum, it was the same approach that Bernard Shaw expressed in another way: "You look at things and say, 'Why?' And I already dream of things that have never existed and say: 'Why not?'".

The history of the first 175 years of Naturgy has elements of all kinds; the road has been long, with moments full of joy and future and others that are harder, difficult to bear. Whatever the case, however, it is truly remarkable for a company to have such a long and intense history, and furthermore as a listed company from the outset. And it is even more extraordinary for the company to have been among the top ten industrial companies in Spain at the beginning of the 20th century, and for it to remain at the same level and in the same position at the beginning of the 21st century.

The history of Naturgy is one of anticipation, of being a pioneer, of arriving before the others, perhaps because of its important position in the energy context,

1. Fàbregas (2009b), pp. 4-12.

perhaps because of its age, but certainly because of its entrepreneurial spirit. For this reason, it was the company that introduced gas lighting into Spain through Barcelona (1842); started up the first electricity transmission line, Seira-Barcelona, at 130,000 volts, in Europe (1922); the nuclear energy sector began with the José Cabrera plant (1968), and introduced the era of natural gas (1969) through the port of Barcelona. It also commissioned Spain's first combined cycle power plant in San Roque to produce electricity from natural gas (2002).

It is also a history of adapting, perhaps in a Darwinian sense, to changes in the political and social environment and forms of competition: beginning in 1843, the flexibility to develop activities in the turbulent political periods of the 19th century; to weather various confrontations with powerful multinationals — French in terms of gas, German and Canadian in terms of electricity —; adapting to face the competition of electricity entering its own market; the development of new uses of gas; cogeneration; the political environments of dictatorship and democracy, monarchy and republic; and different and complex regulatory frameworks. The progressive internationalization of activities has led to the need for effective and realistic adaptation to different cultural and political environments.

Finally, from the very beginning, it is the history of the transformation of reality; without the company's contribution, the society around it would be different; without the first gas lights it would not have been possible to read at night or go out onto the street after dark. Industry would be less efficient and more polluting. The constructive dialogue between gas and electricity perhaps would not have advanced to its full potential. The company has always had an early, timely concern for future issues, which undoubtedly help to transform society: computer systems, transparency, the environment and corporate social responsibility, in a clear desire to listen to different interest groups and the weak signals of the surroundings.

The capacity for change is evident if we remember that the company was created to exist for 20 years, dedicated to gas lighting in Barcelona, using coal as a raw material in its gasworks. With the passing of time, nothing now remains of that initial purpose; the local sphere has been outgrown, first by the national, and later by progressive internationalization. The gas lighting market no longer exists: gas is no longer produced, it is now natural gas. Electricity, which did not exist, is one of the company's important activities with a strong presence in the markets, along with renewable energies. In sum, it is a broad-spectrum multinational energy company of the highest level in the global context.

One may recall those words by Lewis Carroll, the professor of mathematical logic who wrote *Alice in Wonderland*: “What a slow country they have! said the Queen. Here, as you can see, you have to run as fast as you can to stay in the same place. And if you want to go somewhere else, you have to run at least twice as fast”. Unquestionably, Naturgy has been running twice as fast for 175 years, led by its teams and shareholders, achieving a smooth mix of business figures and cultures from the companies that have been merged to form the current company.

This publication presents the results of many years of work and research on the history of Naturgy, and has been made possible by my continued vital interest in the subject, by the preservation of historical archives, and by respect for the history itself of its protagonist. The orientation of this book is more academic than that of previous works, with the aim of making it, as far as possible, a mandatory reference publication. Throughout the course of the journey, different histories are continuously intertwined to illustrate the long journey and the impact on society of an old and important company that is at the same time clearly oriented towards the global future. One of my great satisfactions during these years has been to see how, from an initial lack of interest in the history of gas, thanks to the work and initiatives currently being carried out, a solid group of researchers now exists in this field who will ensure a continuous flow of knowledge creation and publications in the future.

This publication is the seventh of my books to have been published, always in the context of the history of companies, entrepreneurs and institutions. It is my humble contribution to the consideration that companies are living figures, and their teams and their leaders are one of the basic elements in the construction of society. I sincerely thank Naturgy for the commission and the opportunity to publish this work of research. I must express my gratitude for the support and constant encouragement of my large and beloved family, my wife, children and grandchildren — Carme, Mireia, Jordi, Pere, Arabella, Ignasi, Anna, Aina, Judit, Elisabet, Martina, Ton, Ona, Valentina and Ma. Camila — without their incredible understanding, interest and closeness, it would not have been possible to complete this work.

Pere-A. Fàbregas

www.fabregaspere.com

Sitges, June 2018

1826-1842

Gas Lighting in Barcelona:
The Beginning

The history of the gas industry in Spain begins in the first decades of the 19th century, when scientists and technicians began their tests and experiments to try to introduce the technological advances occurring at that time in Europe into a complex nation, marked by Napoleonic invasions and constant political vicissitudes on the long journey towards modernity and a country of more liberal design.

The Spain of Ferdinand VII

The first half of the 19th century was not an easy period for the country. Within a short span, it went from being highly traditional Spain to enduring the Napoleonic invasion (1808-1814). It then made a clear return to absolutism (1814-1820), followed by a three-year period of liberal tendencies (1820-1823), only to then finally return to a decidedly absolutist period in the following decade (1823-1833), all with the same king: Ferdinand VII.

There were military confrontations with the French, but there was also the first sense of overcoming the Ancien Régime with a new liberalism, a process that culminated with the first Spanish Constitution, approved by the so-called Cortes of Cadiz (1812) even if the meetings themselves were held in San Fernando.

The return to power of Ferdinand VII in 1814 produced a period of clear involution towards absolutism with the immediate repeal of all the legislation of the Cortes of Cadiz, a process seasoned by the uprising in the American colonies, and which ended with Riego's pronouncement in 1820.

The new stage called the Liberal Triennium (1820-1823) began with the controversial image of Ferdinand VII swearing in the Constitution of Cadiz and adopting a more liberal policy, of which the promulgation of the General Rules of Public Instruction in 1821 could be an example. However, the triennium soon ended with the entry into Spain of the One Hundred Thousand Sons of St. Louis.

The third period was the Absolutist Decade (1823-1833), in which all the legislation of the previous triennium was repealed and the most absolutist line was recovered, lasting until the death of the monarch in 1833. From this phase, only the creation of the first Spanish bank, the Banco de San Fernando (1829), may be recalled.

A symbol of these times, of oscillating situations and thought, is perhaps the following line from a missive sent by the professors of the Universidad de Cervera

to the king in 1827, telling him: “Far from us the dangerous novelty of drifting that has for so long undermined...”² An example of the intellectual servility of some academic institutions at the time.

Later, in the regency of Maria Christina (1833-1841), a clear effort was made to modernize the country, with provisions to eliminate the privileges of the medieval guilds, abolish the Inquisition and ensure that those who exercised arts and crafts could be worthy of honor and esteem. The Mesta was also abolished and freedom of industry was established. The eight years of the regency removed many of the limitations, obstacles and difficulties of the Ancien Régime, and allowed for gradual progress in the development of companies and commercial activities. However, the first law on joint-stock companies had to wait until 1848, after the stock market crisis of those years and as a prelude to the laws on railways and credit companies that definitively moved the country towards incipient industrialization.

The end of this period was marked by the seizure of power by General Espartero in September of 1840, which led in a few months to the abdication of Maria Christina as regent, who was replaced by Espartero himself as the new regent of the kingdom. In this context Barcelona rose up against Espartero in November of 1842, the city was bombed and remained under siege until February of 1843. During these difficult months, the Sociedad Catalana para el Alumbrado por Gas was set up, which marked the beginning of the history of gas companies in Spain. But in the 19th century, realities were fleeting, and in a few months the scenario changed again: Espartero was forced to step down and leave the country, and Queen Isabella II came of age in July 1843.

The Beginning: José Roura Estrada

The industry to produce gas appeared in the first half of the 19th century, when coal or other raw materials were distilled to produce, when ignited, an intense light that illuminated public spaces, streets and squares, as well as private spaces, private homes, shops and industries. Until then, public lighting was practically non-existent, and in the few places where it was normally available it was produced using oil, which meant that the tanks of the lamps had to be filled every night, an obligation that often corresponded to the local residents themselves. In

2. Exhibition directed to H.M. (*Gaceta de Madrid*, May 3, 1827).

homes, the oil lamp or tallow candle was lit when it was clearly indispensable. In short, at nightfall activity stopped until sunrise in most places and towns. The so-called gas lighting was to change this situation, although its introduction was long and complex: technological advances were needed, as well as social planning and changes in personal habits.

As in many other areas, gas lighting had practically its own particular inventor in each country; this is understood as the person who carried out the first experiments and developed the practical application of the new emerging technology. The story began in the United Kingdom, when William Murdoch managed to light his house in Redruth with the gas obtained from the distillation of coal as early as 1792. Murdoch (1754-1839) was a Scottish technician at Boulton and Watt, the company of the well-known inventor James Watt. His son, James Watt Junior, stopped Murdoch from investigating further the subject of lighting to have him focus instead on the steam engine, until he received a letter from his brother in Paris telling him: "If we intend to do something with Mr. Murdoch's light, we should not waste time, because I have heard that a Frenchman by the name of Lebon is in this same period trying to apply the gas obtained from the distillation of wood for similar purposes".³ A clear case of industrial espionage between Paris and London as early as 1801.

In fact, the Frenchman Philippe Le Bon had developed his first invention in 1799: he had obtained gas for lighting from the distillation of wood and then patented his famous thermolamp. In Germany, a professor of chemistry and metallurgy at the Freiberg Academy of Mines, named Lampadius, lit up the street where he lived (1811); in the United States, meanwhile, the American inventor was Daniel Melville, who lit up his home in Newport, Rhode Island (1812).

In Spain, there are indirect references to some demonstrations and experiments, in Alcoy and Granada, also in the case of the Real Sociedad Económica de Cadiz (Royal Economic Society of Cadiz) in 1817.⁴ But Pascual Madoz explained the first practical use with these words: "...despite the praiseworthy efforts of the enlightened people who tried to introduce such a precious invention during the French invasion, no progress was made until the Real Junta de Comercio de Cataluña (Royal Board of Trade of Catalonia) adopted it to light the rooms of its drawing schools".⁵

3. Hunt (1907), p. 49.

4. García de la Fuente (1990), pp. 1-15.

5. Madoz (1848), p. 185.

Barcelona's first encounter with gas occurred on June 24, 1826, when the chemist José Roura Estrada⁶, a professor at the schools of the Junta de Comercio, popularly known as *Escoles de Llotja*⁷, illuminated a lantern with gas from coal distillation.⁸ That first lantern is still preserved in the building of *La Llotja*, with a plaque that states: "The first tests in Spain of lighting by means of gas were carried out in this building on June 24, 1826 by Mr. José Roura, professor at the School of Chemistry created and supported by the Real Junta Particular de Comercio (Royal Private Trade Board)". These experiments were continued and from then on the drawing rooms, and later on the different rooms of the building, were illuminated with the new and modern lighting obtained through the distillation of coal.

The results of the experiment were not accidental. José Roura, born in Sant Feliu de Guíxols (Girona), PhD in Science from the Université de Montpellier and professor at the School of Chemistry of the Real Junta Particular de Comercio de Catalunya, had been researching the subject for two years and had travelled abroad, subsidized by the Board of Trade, to adopt technology and innovations developed in Europe, and introduce them among manufacturers in Catalonia to help the country advance.

Roura was lucky enough to be able to show his progress to Ferdinand VII during the monarch's visit to the *Llotja* of Barcelona in 1827. On December 18, the king inaugurated the gas lighting of the *Escuela de Nobles Artes* and the courtyard of the *Llotja* building; this was Ferdinand VII's first contact with gas lighting and with José Roura.

Later, as we will see, he was also able to show the new lighting to the future Queen Maria Christina of Bourbon, daughter of the monarchs of the Two Sicilies, when she passed through Barcelona on her way to Madrid in 1829. And perhaps because of these visits, when the birth of the second daughter of the monarchs, Infanta María Luisa Fernanda, was due to take place in 1832, Roura was called to Madrid to produce gas lighting to commemorate the event, which would obviously be a temporary installation.

José Roura's prestige continued to grow over the years. He dedicated himself to finding solutions, necessary for the industry, to countless matters, such as dyes, wines and explosives, among others, and also to his classes at the School

6. See the biography of José Roura Estrada, Fàbregas (1993).

7. Schools of the *Llotja* ("Exchange").

8. "The device with which the gas was obtained for lighting the schools consisted of an oven with four cast iron retorts, a condenser with its accessories, three purifiers and two gasometers." Pi i Arimon (1854) p. 290.

of Chemistry of the Junta de Comercio. The Junta de Comercio lost many of its powers and funding in 1847, which led to the transfer of its schools to the new Escuela Industrial de Barcelona (Industrial School of Barcelona), of which Roura was appointed first director, and which would become the basis for the Escuela Superior de Ingenieros Industriales de Barcelona (Advanced School of Industrial Engineering of Barcelona).⁹

Thus Barcelona, which, as we shall see, has always been a pioneer in the gas industry in Spain, began the first gas lighting at the Escuelas de Llotja, produced in an almost experimental way by José Roura, in what will be the beginning of a history and a relationship lasting almost 200 years. The city, grateful, dedicated a street to him on June 26, 1946, located in the district of Sarrià-Sant Gervasi.

Madrid: The Concession and the Palace Gasworks

The introduction of gas lighting in Madrid was also related, although indirectly, to a visit to the Llotja in Barcelona and Roura's endeavors, but likewise to the Kingdom of the Two Sicilies, as we shall see.

In 1829, the threads of history began to weave themselves again when, after the death of Ferdinand VII's third wife, it was decided that he should formalize a new marriage. Maria Christina of Naples, daughter of the King of the Two Sicilies, was chosen as the future consort.

The nuptials were to be held in Aranjuez on December 9, and on their journey from Naples to Aranjuez, Ferdinand VII, Maria Christina and the monarchs of the Two Sicilies stopped in Barcelona in November of 1829, where they were given a reception in the building of the commodities exchange. The main attraction was the bright illuminations built to display the building's gas lighting. In this case, the gas-lit setting brought together: the interests of the King of the Two Sicilies, who had granted a concession for gas lighting in Naples in 1817¹⁰; Ferdinand VII, who thus within a short span visited the gas lighting of the building for the second time, now accompanied by Maria Christina of Naples; and of course, José Roura Estrada.

All these events must have impressed Ferdinand VII who, upon his arrival in Madrid, immediately ordered José Luis Casaseca, head of the chair of Chemistry

9. Freixa (1986), pp. 26, 28 and 33.

10. Compagnia Napoletana Gas (1962), pp. 41-44.

applied to the Arts at the Real Conservatorio de Madrid (Royal Conservatory of Madrid), to go to Paris to “learn about various branches of industry, including the different methods of lighting with bi-carbonated hydrogen gas”.¹¹

In 1830, the Pragmatic Sanction was promulgated on March 31 and the future Isabella II was born on October 10. In 1831, the subject of gas regained its protagonism, intensely so in the following two years, appearing on three different fronts with multiple interrelations: the lighting of the city, special lighting and the palace gasworks.

The first move was made by the City Council, which called for a competition on March 3, 1831 for projects to illuminate the city by means of gas, a competition to which both Roura and Casaseca, among others, obviously applied. In 1832, the City Council awarded the contract to Manuel del Castillo, but in the meantime, there was a change in the qualifying jury, now joined by Manuel Gaviria — related to the house of Rothschild —, and the contract was finally awarded to José Galcerán, represented by José Viejo Medrano. Afterwards, the contract changed hands several times without anyone doing anything for a long time, until 14 years later, in 1846, the Englishmen Edward O. Manby and William Partington, together with the investment group of the Marquis of Salamanca, finally built the new lighting gasworks through the Sociedad Madrileña para el Alumbrado de Gas. In short, the first City Council that took the initiative to call for a competition to provide the municipality with gas street lighting in Spain was that of Madrid, but problems of all kinds meant the project was not completed until many years later. As we will see, the City Council of Barcelona started later, but achieved results earlier.

While the competition was in progress, the mayor of Madrid had the idea of celebrating the imminent delivery of the queen with gas lighting in the most central part of Madrid, the Puerta del Sol and the surrounding area. The second daughter of Ferdinand VII, Maria Luisa Fernanda, was born on January 30, 1832. Temporary illuminations were often carried out at that time to enhance special celebrations. The date of the luminaires must have been in May of 1832 and would have lasted nine days. When the king was consulted, he gave his approval, but specifically appointed José Roura to carry it out. For the temporary lighting, a gasworks was installed on Carrera de San Jerónimo. Roura achieved great success and later returned to his classes at the School of Chemistry of the Junta de Comercio in Barcelona.

11. Simón Palmer (2011), p. 20.

Also in the first months of 1832, the Minister of Finance, López Ballesteros, as Carmen Simón points out, “inclined the royal courage” to install a gasworks to provide exterior lighting of the Royal Palace; the matter was entrusted to José Luis Casaseca, who was confirmed in April as director of the future gasworks. It was built between 1832 and 1833, and the inauguration was celebrated on June 20, 1833, the day of the swearing in of Princess Isabella as heiress to Ferdinand VII. The king died on September 29 of the same year, marking the start of the regency of María Cristina. The palace gasworks first used oil as a raw material; from 1835 onwards, it switched to using *miera*¹², and finally coal. José Luis Casaseca remained as director until 1836, when he went to Havana to take up the chair of Chemistry he had been awarded there.

Thus, from 1833 onwards, two small gasworks existed in Spain and both were used to illuminate singular buildings: the Lotja for commodity traders in Barcelona and the Royal Palace in Madrid. The lighting of the cities, with its important impact on their inhabitants, arrived later; the gasworks were much larger, no longer designed for a building but for a city, and pipelines had to be installed in the streets. The big customers were the town and city councils, but citizens also had to be convinced to install the new lighting in their homes. In short, a different world with other dimensions and other complexities, which in Spain began in Barcelona in the 1840s.

Gas Lighting in the World

After the era of experiences and laboratories, the popularization of gas lighting in Europe and the world usually responded to the drive and initiative of entrepreneurs of various types. What all of them possessed, however, was the necessary determination to master technology, obtain the necessary financial resources and, at the same time, win over local institutions, which were not always ready to change and evolve in the new times.

This history began in London, where the German Frederick Winsor managed in 1812 to start the world’s first gas company: The London and Westminster Gas Light and Coke Co. The process continued with Rembrandt Peale, who in 1817 promoted

12. The use of *miera* (juniper tar) was a peculiar characteristic of the first palace gasworks. *Miera* was a thick, very bitter, dark oil, obtained from the distillation of juniper berries and branches.

Table 1. Introduction of gas lighting in the world (1812-1872)

Year	Country	Year	Country	Year	Country
1812	United Kingdom	1842	Spain	1860	Romania
1817	United States	1843	Switzerland	1861	Malta
1819	Belgium	1844	Cuba	1862	China
1819	France	1846	Sweden	1862	Hong Kong
1822	Ireland	1847	Czech Republic	1864	Egypt
1825	Germany	1848	Norway	1864	Venezuela
1825	Netherlands	1852	Argentina	1865	Brazil
1833	Austria	1853	India	1865	New Zealand
1835	Russia	1855	Mexico	1867	Peru
1836	Canada	1856	Poland	1868	Sri Lanka
1838	Hungary	1857	Chile	1870	Ecuador
1841	Australia	1857	Denmark	1872	Japan

Source: Petroleum Economist (1996), *World Gas Yearbook 1996*. London, pp. 39-50.

The Gas Light Co. of Baltimore in the United States, while Brussels and Paris joined the ranks in 1819 with, respectively, the Société Meeus and the Société Royale, the latter encouraged by Louis XVIII (Table 1).

Spain was the 13th country in the world to implement gas lighting, through the activity in Barcelona of the Sociedad Catalana para el Alumbrado por Gas, the first historical antecedent of the current Naturgy. Valencia, Cadiz and Bilbao followed and later, in 1847, Madrid. These became cities where the darkness of night no longer was an obstacle to going out onto the street, working, reading or enjoying leisure, and thus spaces for activities, contact and relationship were increased in these cities.

Gas was globalization *avant la lettre*: the first gasworks in England was promoted by a German, while the first gasworks in Germany, specifically in Hanover, was set up by an English company: the Imperial Continental Gas Association. The promoters of gas in Amsterdam, Oslo and Calcutta were also English.¹³

The French took the initiative in Spain, Switzerland, Egypt and Algeria, and also in certain areas of Italy. In Japan, the first city to introduce gas was Yokohama, led by Kaemon Takashima and the French technician Henri Auguste Pelegrin, who later became director of the Malaga gasworks. In Prague the promoter of the gasworks was the City Council. A curious case is that of Cuba, where gas was

13. Fàbregas (2003), pp. 81-114.

introduced into Havana through a company owned by the American financier James Robb and the queen mother of Spain.

Of the companies that introduced gas into their respective countries, only two still exist today: Naturgy (1843) and Hong Kong & China Gas Co. (1862)¹⁴, both with more than 150 years of history.

The Barcelona Lighting Auction

Around 1843 the city of Barcelona was the most dynamic in Spain, permanently at a boil due to the nascent process of industrialization, with a population of around 150,000 inhabitants. The pace of its development had accelerated after Charles III had granted the city permission to trade with the American colonies at the end of the 18th century; a new commercial bourgeoisie was thus created, basically dedicated to maritime trade, which sparked a new mood in the city through the Real Junta Particular de Comercio (1760).

At that time the Universidad de Barcelona was still confined to Cervera, where it had been relocated by Philip V after the events of 1714, and was still a Literary University, meaning that mathematics could only be studied within Philosophy, as a subject entitled Sublime Calculus.¹⁵ This education was very distant from what was required by industry, commerce and, in general, the economy.

The university's lack of suitability to social needs was evident, and civil society through the commercial bourgeoisie corrected the problem by creating the schools of the Junta de Comercio, where at the end of the 18th century it was possible to study physics, chemistry, navigation, bookkeeping, languages, shorthand and fine arts, among other subjects. It was this knowledge that would enable society to clearly advance in the growth and development of its processes of industrialization and international trade. As already mentioned, the Escuela de Ingenieros Industriales de Barcelona was created from the schools of the Junta de Comercio in 1850, among other modern institutions.

14. Hong Kong & China Gas Company Limited (Towngas) was founded in 1862 as Hong Kong's first utility company. It started operating in Mainland China in 1994 and is currently active in 26 provinces, municipalities and autonomous regions of the country. It supplies gas to 1.9 million customers. See www.towngas.com [accessed 22-10-2017].

15. It was not until 1845, with the reform of Pedro José Pidal, that the faculties of Philosophy were created, which included mathematics, physics, chemistry and natural sciences as specialties. To get a doctorate in science, one had to study Series and sublime calculus — the doctor of science and letters could become a doctor of philosophy. Sánchez Ron (1988), pp. 119-120.

Since the end of the 18th century, textile workshops had begun appearing in Catalonia, but it was not until 1832 that the first steam-powered textile factory in Spain was set up and the first automatic loom was used, the factory of José Bonaplata in Barcelona. Workers burned down this factory in 1835 because they believed the machines were taking jobs away from them. Bonaplata received an indemnity from the government and with the money he built a foundry, but located in Madrid, which was managed by his brother Ramon.¹⁶ The other brother, Narcís, settled in Seville, where he would be one of the creators of an important cattle fair, later known as the Feria de Abril.¹⁷

The situation in the 1840s was one of high dynamism and the creation of institutions; the Sociedad Catalana para el Alumbrado por Gas appeared in 1843, but this was only the beginning. The following year, the Caja de Ahorros y Monte de Piedad of Barcelona and the Banco de Barcelona of Manuel Girona were set up. In 1847 the largest textile factory in the country was created, La España Industrial; while in 1848 the first railway line in Spain was inaugurated (Barcelona-Mataró), and in 1855 La Maquinista Terrestre y Marítima was established, dedicated to the construction of large machines.

On September 1, 1840, General Espartero pronounced himself against the regent María Cristina, seized power and began a progressive period, although obviously with the ups and downs typical of the society of the time. Coincidentally or not, on September 16, 1840, only a fortnight later, the Frenchmen P. Emorine and André Coulon¹⁸ presented a proposal to the Barcelona City Council to install public lighting by means of gas on its streets; the mayor at that time was José Maluquer Montardit. The proposal was unsuccessful, but it led the City Council to publicly call for tenders for the city's gas lighting in December of the same year, and it additionally informed the mayors of London, Paris and Marseilles, requesting them to disseminate this competition in their respective municipalities.

The constant instability in Spain during the 19th century led to a political change in the Barcelona City Council that began in 1841, precisely on January 1. The new mayor was Ramón Ferrer Garcés, professor of Legal Medicine at the Universidad de Barcelona, as well as president of the Ateneu Barcelonés.

16. Ramon Bonaplata was married to Josefina Roura Bonet, daughter of the scientist José Roura Estrada.

17. Nadal Oller (1983), pp. 6-19.

18. Fàbregas (1993), pp. 60-71.

The change of municipal government led to the annulment of the offers that had been presented and preparations were begun to convoke a new competition, but only after having studied the rules of the tender process, known as *tabas* at the time, previously approved by the Diputación Provincial (Provincial Council), which was the institution that ultimately had to sanction the actions of the City Council.

Section 2 of the City Council, after consultation with experts, prepared a report on the terms of the competition, which was approved by the City Council on March 6, 1841, and by the Diputación Provincial on March 18, 1841.¹⁹ The report, apart from the technical bases, explained the motivations of the City Council to promote the introduction of gas lighting, including the desire to provide an innovation that would allow the city to be among the leaders in Europe in this area, and also for economic reasons. The City Council expected a reduction of public lighting costs by almost half, while also improving the level of lighting. The precise quantification stated that: "...the existing 2,280 oil lamps represent an annual expenditure of 38,461 *duros*, 18 *reales* and 33 cents, and the new 652 lamps that will replace them will cost only 19,248 *duros*, 9 *reales* and 10 cents per year...".²⁰

The initiative immediately had its defenders and detractors, the former praising the modernity the project would bring, while the latter were indisposed to any change or had interests in the oil business that the gas would replace. The difficulties regarding the need to import from abroad the appropriate materials and facilities were likewise significant, a circumstance not always well regarded by the citizens, and with costly tariffs that those who obtained the award had to be willing to pay.

Two offers were presented, both of French origin — made by Charles Lebon and P. Emorine — and a period of debates, awards by the City Council, cancellations by the Diputación, and proposals for improvements began. Finally, a new competition was held, to which Charles Lebon and François Reynaud presented themselves; the final auction was held between the contestants, on May of 17, 1841, in the City Council's Salón de Ciento. After the appropriate reductions and improvement of conditions, Lebon managed to win the contract. The French

19. The approval by the Diputación and the bases of the tender were published in the press. *Diario de Barcelona*, March 22, 1841.

20. NFHA.SCAG. City Council of Barcelona, Section 2.: *Informe Alumbrado por Gas* [06-03-1841].

nationality of the two contestants suggests that there may have been some kind of prior relationship between them.²¹

But for the contract to be definitively granted, Lebon had to be able to provide the deposit of 25,000 *duros* required by the competition rules, and it is here that the Gil family appeared, led by Pedro Gil Babot²² accompanied by his children. They provided the requested guarantee and were associated with Lebon in the company, in which Lebon would be the industrial partner and the Gil family the financial partner. The contract between Charles Lebon and Barcelona City Council was finally signed on July 3, 1841 for a period of 15 years.²³

The local press at the time, when referring to the agreements to install the new gas lighting service, stated: "...we are particularly pleased to announce the proximity of this urban improvement, undoubtedly a precursor of the many in which the cultured and industrial Barcelona is destined to take the initiative".²⁴

In short, the forward thinking of the Barcelona City Council, the initiative of a French technician, Charles Lebon, and the financial and management support of the Gil family allowed progress to be made in the installation of the first gasworks for public lighting in the country.

The Figure of Charles Lebon

The career of Charles Lebon (Dieppe, 1799 - n.d., 1877) was that of an innate entrepreneur prepared to achieve whatever he set his mind to. During his life he was incredibly active in creating gasworks, both in France and Spain, and likewise in Algeria and Egypt. He was said to have a strong, even violent and disorderly character. It is claimed that when his engineers and plant managers asked him for money for their work and investments, he would respond: "It is not difficult to work with money; I want you to work for me without money".²⁵

21. Falgueras (1969), pp. 49-50. La Compagnie Centrale d'Éclairage par le Gaz. Lebon et Cie. indicates in its history that Charles Lebon won the contract for Barcelona in 1841 in concert with Emorine and Reynaud, and also with Farrán, who would later be in the administration of the Barcelona company. Lebon et Cie. (1947), p. 105.

22. Pedro Gil Babot was the 33rd largest tax contributor to the province of Barcelona in 1852; Jaime Safont headed the list. *Boletín Oficial de la Provincia de Barcelona*, May 14, 1852.

23. Contract signed between the City Council of Barcelona and Mr. Carlos Lebon whose current assignee is the Sociedad Catalana para el Alumbrado por Gas, awarded before the Notary Public of S.E.D. Jaime Burguerol on July 3, 1841. Barcelona: Publication of the *Diario de Barcelona*, 1859.

24. *Diario de Barcelona*, July 12, 1841.

25. Lebon et Cie. (1947), pp. 13-18.

Table 2. Lebon et Cie. Gasworks built

France	Spain	Algeria	Egypt
Bernay	Alicante	Algiers	Alexandria
Chartres	Almería	Blida	Cairo
Dieppe	Barcelona	Orán	Port Said
Fecamp	Cadiz		
Granville	Cartagena		
Honfleur	Granada		
Morlaix	Murcia		
Nice	Puerto de Santa María		
Pont Audemer	Santander		
Quimper	Valencia		
Saint Brienc			
Saint Malo			
Yvetot			

Source: Lebon et Cie. (1947), p. 47 and by the author.

His crowning achievement was the limited partnership, *Compagnie Centrale d'Éclairage pour le Gaz, Lebon et Cie.*, founded in 1847 in Paris, and which eventually became involved in twenty-nine gasworks in four countries (Table 2).

In 1872 and as a consequence of the crisis produced by the Franco-Prussian war, his son Eugène Lebon, of a milder business spirit better suited to the already considerable size of the company, forced him to resign from the company, in yet another indication of the complexity of doing business directly with Charles Lebon. In 1910, the *Compagnie Centrale* was listed on the Paris Stock Exchange with a capital of 17.5 million francs; it was the largest limited partnership on the entire stock exchange. With the nationalization of the gas and electricity sectors in France after World War Two, the company's gas and electricity assets were integrated into the state-owned companies *Électricité de France* and *Gaz de France* in 1946 and 1947.²⁶

Charles Lebon's restless character led him to join the Imperial Volunteers in 1815, at the age of sixteen. Later, in 1830, he played a notable role in the advent of Louis Philip I of France, the new king proposed by General La Fayette and imposed by the barricades, where he was wounded twice. For these performances Lebon

26. Today, the company created by Charles Lebon in 1847, now called *Compagnie Lebon* and dedicated to the hotel, health, and capital-investment sectors, continues to exist. See compagnielebon.fr [consulted 07-11-2017].

received the Legion of Honor and the Order of the Cross of July, and maintained a personal relationship with La Fayette from then on.

Beginning in 1832, he worked in Dieppe, in commercial activities, where he was a town councilor and editor of the *Mémorial dieppois*. Finally, he reached an agreement with the Dieppe City Council to build his first gasworks, which he opened in 1838.

After that first experience, and only two years later, in 1840 he appeared in Barcelona, where he bid on the gas service auction that had been called by the City Council and was awarded the service in 1841. It should be noted that Barcelona was Charles Lebon's first venture outside his hometown of Dieppe, and also the first gas concession granted in Spain; it was also the first multinational investment in the country's public services sector.

The choice of Barcelona, at the time just beginning its period of dynamic industrialization, makes a lot of sense. But a more in-depth analysis should be made of the real motivations that brought Lebon to the city. The reality is that a great distance separates Dieppe from Barcelona and not only in physical terms.²⁷

The Gil Family Dynasty

The Gil family was mainly active in maritime trade since 1813. Over the years, it owned up to 12 ships outright, with another 30 in its service chartered from Tarragona, Palma de Mallorca or Barcelona, and with destinations mainly in Latin America, but also St. Petersburg²⁸ (Table 3).

The patriarch of the family, Pedro Gil Babot (Tarragona, 1783 - Barcelona, 1853), settled in Barcelona at the age of 31 at which time he was already the owner of the frigate *Merced*, which exported wine from Mallorca to Saint Petersburg. He was the progenitor of a dynasty of businessmen, proprietors and financiers who for many years were involved with gas in Barcelona. The relationship began with the presentation to the Barcelona City Council of the guarantee of the 25,000 *duros* that Lebon needed to start his activity. Gil Babot was a member of parliament for several legislatures, and fourth vice-president of the chamber in 1841. He moved his residence to Madrid, but created and maintained an efficient network of business,

27. Lebon's only experience was with the gasworks in Dieppe, a city that at that time had 16,820 inhabitants (1836), while Barcelona was almost 10 times larger, with 121,815 inhabitants (1842).

28. Fàbregas (2011a), p. 763; Rodrigo Alharilla (2010), pp. 24-41. García-Martín (1990), pp. 22-53.

Table 3. Pedro Gil Babot. Ships wholly or partly owned (1813-1864)

Year	Name	Tipo	Astillero	Valor
1813	<i>Merced</i>	frigate	—	—
1814	<i>Cristina</i>	frigate	Lloret	24,000 pounds
1816	<i>Constancia</i>	polacca	Lloret	13,800 pounds
1817	<i>Tellus</i>	brig	Barcelona	—
—	<i>Cristina</i>	brig	—	—
1824	<i>Romano</i>	brig	Lloret	5,000 pounds
1825	<i>Los Buenos Amigos</i>	ketch	Lloret	2,600 pounds
—	<i>Concepción</i>	schooner		1,800 <i>duros</i>
1830	<i>Cristina</i>	brig	Lloret	6,000 pounds
1831	<i>Leopoldo</i>	brig	—	3,000 <i>duros</i>
1836	<i>Merced</i>	brig	Blanes	6,000 <i>pesos fuertes</i>
—	<i>La Curra</i>	frigate	Arenys	16,000 <i>pesos fuertes</i>

Source: Rodrigo Alharilla (2010), p. 33.

information and management, with his wife in Barcelona, and children in Paris and London.

Pedro Gil was in the salt company of the Principality of Catalonia (1831) and in the Compañía General de Minas de Cataluña y Aragón (1842). He also acquired properties during the confiscation of Church properties (1840-1842), the main one being Riudabella, belonging to the monastery of Poblet, which is still in the family.

He also took advantage of his stay in Madrid to acquire an important art collection, one of the foremost in Spain. The collection started by Pedro Gil Babot and continued by his descendants, mainly Leopoldo Gil Serra and Leopoldo Gil Llopart, was very important both because it was one of the first such collections in Spain and because he was one of the few Catalan collectors of the time who did not focus only on local painting, but had a broader and more inclusive vision. After being left in deposit for more than twenty years in the museums of Barcelona, the collection was mostly ceded for a symbolic price in the period 1944-1946, and currently appears in the catalogues of the Museu Nacional d'Art de Catalunya (MNAC).²⁹

The prominence he achieved in Barcelona led to Gil Babot's appointment as a member of the city's Junta de Administración y Caudales Públicos (Administrative and Public Revenues Board) (1823), then of the Junta de Armamento y Recursos

29. Fontbona (2001), p. 134.

del Principado (Armaments and Resources of the Principate Board) (1835) and finally of the Junta de Sanidad (Health Board) (1847).

Gil Babot was elected as a representative to the Cortes in 1836, meaning he was one of the signatories of the Constitution of 1837; he was re-elected in 1839 and 1843, which made it necessary for him to repeatedly stay in Madrid during this period. In 1853, Queen Isabella II granted him the appointment of Knight of Grace of the Illustrious Military Order of St. John of Jerusalem, as well as that of Commander of the Royal Order of Isabella the Catholic. Apart from his fundamental role in the installation of gas in Barcelona, he also played a role in the Madrid gas issue.

Pedro Gil Babot married Josefa Serra y Cabañes and had eleven children, three of whom were founders of the Sociedad Catalana para el Alumbrado por Gas of Barcelona, Pedro, José and Pablo Gil Serra. The eldest, Pedro Gil Serra, was a financier; the second, José, an entrepreneur, with a remarkable activity in the gas industry; while the third, Pablo, became a financier to replace the eldest, Pedro, in the Paris banking house upon Pedro's untimely death. Claudio was an engineer and designed a railway for the company Carbonífera de Siero y Langreo (1852), and an innovative gasometer for gasworks (1868), recognized as an advance by English industry. Leopold was the brother who survived all the others of his generation, and who had to abandon his initial love of painting to become the manager of the family.

The family, although focused on its business activity, also devoted time and effort to issues such as the preservation of the monastery of Poblet, the construction of such jewels of modernism as the Hospital de Sant Pau in Barcelona by Lluís Domènech i Montaner, and the conservation of the archaeological ruins of Tarragona, the three sites declared World Heritage Sites by UNESCO, in 1991, 1997 and 2000, respectively.³⁰

The family's relationship with Barcelona was intense. On the occasion of the donation of an important collection for the future Museo Textil, an article published in 1967 stated: "With this donation, the affection of the illustrious Gil family for their city over the course of a century is once again demonstrated. Proof of this was the donation of the hospital of Sant Pau by the donor's uncle, Pablo Gil Serra; the introduction of gas in Barcelona by José Gil Serra; the donation of the Parque de Monterols by his sister Manuela Gil de Escolá, as well as many other participations in charitable and cultural activities that have been of great benefit to Barcelona".³¹

30. UNESCO: World Heritage List. See whc.unesco.org/en/list/ [accessed 8-11-2017].

31. *La Vanguardia*, February 10, 1967.

The Barceloneta Gasworks

The activity of the new concessionaire began with the search for land to build the gasworks in the already very densely populated Barcelona, which was still enclosed within its city walls; it was important that it should be close to the port, which was where the supply of coal, the raw material needed to produce the lighting gas, would arrive. It was finally decided to locate the new gasworks in the Barceloneta neighborhood, in a vineyard located outside the city walls and close to the port owned by the Gil family, who had been acquiring various plots of land in the area over the years.

The choice of locating in Barceloneta the first gasworks for public gas lighting in Spain was a significant one, and it remained there for more than a hundred years. Currently on the same land are the Parque de la Barceloneta and the new Naturgy building, where the group's headquarters at that time were moved in 2006.

The Barceloneta neighborhood where the first gasworks was built was designed by the military engineer Juan Martín Cermeño in 1749. It was conceived as a grid of fifteen streets parallel to the port crossed by three cross streets, in which ground floor and one-floor houses would be installed, with an orientation and heights that would allow for air circulation and adequate sunlight in the houses. In addition, the height of the buildings was limited so as not to interfere with the military uses of the area from the city walls.

The first stone of the district was laid on February 3, 1753. Initially it was a fishermen's quarter because of its proximity to the port, although its location outside the walls left it a little isolated from the urban fabric of Barcelona. But when the liberalization of industry was decreed (1836), its proximity to the port and the city placed Barceloneta in a good position to attract new factories and workshops, and thus, in those early years, the following industries installed themselves, among others: the Nuevo Vulcano shipbuilding yards, the gasworks of the Sociedad Catalana and the steam engine manufacturing workshops of the British Alexander Brothers.

Two additional elements helped Barceloneta to become an industrial district: the first was the prohibition, decreed by the City Council in 1846, of installing new industries with steam engines within the city walls; the second was the inauguration of the Mataró railway station (1848) in its area of influence, later known as the Estación de Francia.

Finally, when La Maquinista Terrestre y Marítima was installed in 1855, dedicated to the construction of steam engines and all types of heavy machinery,

the list of large factories in the area were now complete. Barceloneta, which had been born under military jurisdiction, managed, after more than a hundred years — in 1862 — to pass to governance by the City Council.

La Barceloneta has always had a strong personality as a neighborhood, with neighbors who have been proud of their district. Many generations have worked in its large factories over the years, in a neighborhood that was both seafaring and industrial, and a special relationship has been created between people and families.

One of the interesting features existing in the Barceloneta of the early days of gas was the bullring, called El Torín, at that time the only one in the city, which maintained a long historical relationship with the gas company. The construction was carried out in the context of the authorization granted by Ferdinand VII in the Royal Decree of March 3, 1827, which allowed the Casa de Caridad de Barcelona (Charity House of Barcelona) to carry out bullfights, in order to help support the asylees of this charitable institution with the income obtained.

The bullring was designed by the architect Josep Fontseré Domènech. The project faced numerous obstacles, given that, being outside the wall and in an area considered a military zone, no high, solid buildings were allowed. This meant construction on the building was carried out in a conventional way only up to the first floor, and the higher areas were built out of wood that could be dismantled, something necessary in case of war, to allow the firing of artillery from the city wall.

The inauguration of El Torín took place in 1834. The bullring got off to a bad start, because in 1835, the meekness of the bulls in a bullfight provoked the anger of the spectators who left the bullring and began for the first time in history to burn churches and convents in the city, which led to the governmental closure of the bullring for fifteen long years. Popular wisdom gathered the facts in the following verses:³²

*El dia de Sant Jaume, de l'any trenta-cinc,
varen fer gran festa a dintre el Torín.
Van sortir sis toros d'allò més dolents
i això va ser la causa de cremar els convents.*³³

32. Cortés y Esteve (2012), p. 167.

33. Translator's translation: "The day of Saint James, in the year of thirty-five, / a big celebration was held in El Torín. / Six very poor bulls were used / which was why the convents were burned."

With time, however, the love of bullfighting in Barcelona visibly increased. A second bullring, Las Arenas, was built in 1900, and a third in 1914, the Monumental, a unique case in the world. In recent years, conversely, bullfighting has clearly declined in the city, and in 2012 bullfighting was banned in Catalonia.

Early on, in order to install the gasworks next to the bullring, and therefore in the area subject to the firing of canon from the city walls during times of conflict, permission had to be sought from the military authorities, with the argument that if the construction of a leisure center had been authorized in the area, such as a bullring, an installation that would provide the city with such a service as important as lighting, both in its streets and in its factories, shops and homes, should also be authorized.

Obviously, in order to extend a pipeline from the gasworks to the city center, permission again had to be requested from the military authority to install it, drilling through the base of the city wall.

Once the gasworks was installed in the vicinity of El Torín, at various times in their history the bullring and the gasworks had a special relationship; for example, gas from the gasworks was used to fill the hot air balloons of famous aeronauts who exhibited their daring sport, ascending from the bullring. At least one Mr. Arhan was registered in 1840 and in 1866, the intrepid Madame Potievin. El Torín was the bullring of an era, and was immortalized in the paintings of important painters such as Pablo Picasso, Ramon Casas and Santiago Rusiñol.

Over time, the gas company took a stake in the company Sociedad Anónima Plaza de Toros de Barcelona, owner of El Torín. With the closure of the bullring in 1946, Catalana de Gas y Electricidad, S.A., the gas company's name at the time, came to control practically the whole of the company of the bullring, which led to its dissolution and to the expansion of the land area of the gasworks, which installed itself on the neighboring property.

Once the contract was won, Lebon began the construction of the gasworks and the first pipelines under the watchful eye of a changing City Council. On November 17, 1841, Tomás M^a de Quintana Badía was appointed mayor, and on January 1, 1842, José M^a de Freixes Borrás was appointed mayor. Volatility of positions of representation at all levels was a constant throughout the 19th century.

In order to commence activity, various difficulties had to be overcome, such as:

- Importing the necessary materials from France in some cases, and in others, having to teach local artisans how to produce the required elements.

- Resolving the processing of the corresponding permits from the military authority.
- Obtaining coal supply contracts with English suppliers.
- Negotiating with the City Council how the s would be installed in the subsoil of the streets, a work for which there was no precedent.

Finally, after thirteen months of intense work, on August 8, 1842, the first two gas lanterns were lit in front of the basilica of Santa María del Mar. On August 23, a text published in newspaper stated: “At this moment, at ten o’clock, a gas regulator is shining in the Plazuela de Santa María, which at five or seven feet high, with a diameter of nine points at the most, provides enough light for one to be able to read from forty feet away, and to walk down one of the streets on which it shines for more than two hundred. We congratulate the company”.³⁴ The exaggerated descriptions can only be understood from the deficiencies existing in the previous system of street and square lighting.

The official commencement of the new lighting system took place on September 5, 1842, the date from which the fifteen-year contract began, which was to expire on September 5, 1857. However, the public inauguration of gas street lighting took place on October 1 and that of private lighting on November 1, 1842.³⁵

To complete the implementation of gas in Barcelona, all that was needed was to set up a company to administer the contract won by Lebon and to ensure solid financing for the following years that would allow the progressive extension of the networks and pipelines around the city. This would also allow further development, both in public lighting and in the introduction of the new lighting system in the shops and homes of the citizens.

Gas Lighting and Social Change

Once the company was established and the service was inaugurated, Barcelona began to note the sociological and behavioral changes that the new service generated in a city that still did not have a drinking water service or any other type of network service. The gas lighting of the streets and later of the homes, shops and meeting centers made it possible, almost immediately, to begin to overcome the

34. *El Imparcial*, August 23, 1842.

35. Pi i Arimon (1854), p. 292. On gas in Barcelona, consult Arroyo (1996).

agricultural cycle, and to use nights — apart from for rest — for reading, leisure or work. In short, time came to be marked by the clock and social organization and not by the rays of the sun, as had been the case since ancient times.³⁶

When gas lighting appeared in Barcelona, the city had already been illuminated with oil lights since 1752. These projected a very dim light, with the added problem that the combustion itself dirtied the glass of the lanterns, which had to be refilled with oil every day. Oil street lighting had also been installed in Madrid in 1746.

In England, the introduction of gas lighting caused unexpected social effects, such as angry protests by whalers whose primary customers were factories that produced very popular candles from whale blubber, and who saw gas as a real and dangerous competition. The same phenomenon occurred when gas was introduced in Madrid: protests were staged by oil suppliers who felt that gas was a threat to domestic agriculture. The sectors that had controlled lighting until the introduction of gas tried their best to prevent the new lighting from prospering, but the technological advance was so significant, both in terms of the quality of the light and the continuity of supply, that they could do little to halt its progress.

In contrast, industrialists were happy because they believed that production would increase thanks to the fact that factories could continue functioning despite nightfall, with the consequent increase in production and productivity due to the clarity and constancy of gas lighting. Another beneficial effect for industry and commerce was the general reduction in fire insurance premiums, as insurance companies considered gas lighting to be much safer and less prone to fire than traditional oil or candle lighting, which caused countless, devastating fires in the early 19th century.

Thus, the first supply network appeared in Barcelona, which required new regulations, but which provided the invaluable feature of continuous service at the consumer's permanent disposal and in his own home.

36. Fàbregas (2013a), p. 15.

1843-1854

The Sociedad Catalana
para el Alumbrado por Gas

Politics regained its importance at the end of 1842. Private gas lighting was inaugurated on November 11, and only two days later, on November 13, the city of Barcelona rose up against the regent Espartero. The French consul, Ferdinand de Lesseps, described this situation as follows: “The Barcelona uprising has no other cause other than the irritation of the Catalans against the military rigors of General Zurbano and against the commercial negotiation projects attributed to the government of Madrid. The establishment of the Fifth or Recruitment Law has led to the uprising”.³⁷

The city was surrounded by General Van Halen’s army, while Espartero traveled quickly from Madrid to meet him. Negotiations between the municipality and Van Halen failed, and on December 3 it was decided to bomb the city. In twelve hours, 1,014 projectiles fell on Barcelona; evidently, the city surrendered and was taken over by the army. It is said that, after the bombing, Espartero spoke the phrase which has since become famous: “We must bomb Barcelona at least once every fifty years”.

The repression was significant; the city was forced to rebuild the military fortress of the Citadel and pay a compensation of 12 million *reales*. In addition, 13 people were executed and 74 sentenced to 10 years’ imprisonment. It was also decided to establish and maintain martial law until further notice. In January of 1843, the repression continued with the dissolution of the Asociación de Tejedores (Weaver’s Association) and the prohibition of all the press, with the exception of the *Diario de Barcelona*. Finally, on February 19, 1843, martial law was lifted and the city managed to recover its lost normalcy.

The Constitution of the Company

In those difficult moments, on 28th January 1843, with martial law still in force in Barcelona, some citizens left their homes to meet with the notaries José Manuel Planas Compte and Jaime Burguerol, and set up the Sociedad Catalana para el Alumbrado por Gas.³⁸ Special note should be made of the spirit and tenacity of those men who, amid such complicated circumstances in the city, had the

37. “Le mouvement de Barcelona n’a d’autre cause que l’irritation des catalans contre les rigueurs militaires du Gal. Zurbano et contre les projets de négociations commerciales attribuées au gouvernement de Madrid. L’établissement de la *Quinta* ou loi de recrutement a achevé de soulever les esprits.” Risques (1980), p. 95, n. 7.

38. Fàbregas (2009a), pp. 181-182.

courage to invest their capital in one of the first joint stock companies to be formalized in Spain.

The Sociedad Catalana para el Alumbrado por Gas was constituted with a capital of 6 million *reales de vellón*, represented by 1,500 shares of 4,000 *reales de vellón* each³⁹; a duration of 20 years was fixed for the company, and its headquarters was established in Barcelona, at Calle de la Merced 16 and Calle Serra 22, where it remained until 1895, when it moved to a new headquarters on the current Avenida del Portal de l'Àngel 22, then Plaza de Santa Ana.

At the time, the start-up of a company, at a financial level, normally had a promoter group that contributed rights or facilities, for which the group received the corresponding shares. Subsequently, and as resources were needed, new shares were issued and placed on the market, which were initially partly disbursed, in order to obtain the necessary flow of financing for the company through these two mechanisms, more shares or greater disbursement, as it developed its projects.

In the case of the Sociedad Catalana, the 1,215 shares awarded to Lebon were the counterpart of the assignment to the company of the “privilege and other acquired rights, having previously begun the construction of the gasworks and the works of the pipelines that were carried out with prodigious activity”.⁴⁰

In short, the two initial principal shareholders were Charles Lebon, the promoter and technician, with 81% of the shares, and the Gil family, represented by the three brothers, Pedro, José and Pablo Gil Serra, who were the company's financial and banking managers, who received 13% of the shares. The rest of the shareholders were basically in one or the other of these two groups, for example: Carlos Torrents Miralda was a partner in other Gil businesses, while Carlos Karsniki carried out other activities with Lebon (Table 4).

The 1,215 shares awarded to Lebon were to be placed among new investors, except 300 shares to be deposited in the social fund to guarantee that he would comply with his commitments to start up the gasworks and facilities, including the laying of 30,000 pipes, and other obligations arising from the contract with the City Council. Despite the significant presence of Lebon and the Gil family, special note should be made of the content of Article 17 of the company's bylaws, which stated

39. One peseta equaled four *reales de vellón*. NFHA.SCAG. *Escritura de Constitución de Sociedad ó Contrata social y Reglamento de la Sociedad Catalana para el Alumbrado por Gas* (28-01-1843). As in so many other cases of the time, the deed was published for its use and dissemination: *Contrata y Reglamento de la Compañía Anónima entitled Sociedad Catalana para el Alumbrado por Gas*. Barcelona: Printed by Agustín Gaspar, 1847.

40. Pi i Arimon (1854), p. 292.

Table 4. Sociedad Catalana para el Alumbrado por Gas. Founding partners (1843)

Shareholder	Number of shares	% shares
Charles Lebon	1,215	81.00
Pedro Gil Serra	100	6.67
José Gil Serra	50	3.33
Pablo Gil Serra	50	3.33
José Farrán	40	2.67
Carlos Torrents Miralda ⁴¹	10	0.67
Juan Vila	10	0.67
Carlos Karsniki	10	0.67
Antonio Tintó	5	0.33
Juan Font Riera	5	0.33
José Riera	5	0.33
TOTAL SHARES	1,500	100.00

Source: NFHA.SCAG. *Escritura de Constitución de Sociedad o Contrata social y Reglamento de la Sociedad Catalana para el Alumbrado por Gas* (28-01-1843).

that: “Each share shall give the right to one vote in general deliberations; however, no one under any pretext may have more than ten votes regardless of the number of shares he or she holds,” an example of incredible respect for minority stakeholders a century before the appearance of regulations on good corporate governance.

In order to attract new investors, in the articles of association Lebon guaranteed shareholders an interest rate of 6 % per annum and the possibility of an additional dividend of 2 %, which conditioned the payment of remuneration of the 300 shares left as collateral, “he left 300 shares, which were not to earn interest until the others had received what they were promised and a 2 % dividend”.⁴²

Note must be made of the special temperament of the founders of a company that was created to carry out intensive investment in industrial activity and with connotations of public service, in the Barcelona of the mid-19th century. It was not an industrial activity of light investment such as, for example, a textile factory, which was where industrialization processes had traditionally started in European countries.

41. Carlos Torrents Miralda was in 1852 the sixth largest taxpayer in the province of Barcelona. *Boletín Oficial de la Provincia de Barcelona* (14-05-1852).

42. Pi i Arimon (1854), p. 292.

At that time, in 1843, only seven years had passed since industry had been liberalized by decree and there were still no banks or savings banks, which did not appear until 1844. However, even if they had existed, they wouldn't have financed industrial investment, but rather working capital: a good example of this are the statutes of the Banco de Barcelona of 1844, the progressive bank of the time, which indicated that the entity would be responsible for: "...discounting bills of exchange, promissory notes and other negotiable bills of exchange, the term of which does not exceed four months, guaranteed by three well-known solvent firms", and recalls that "...the status of shareholder provides no right to the discount".⁴³

There was also no precedent for digging up streets to install a service, nor for a company to permanently occupy the subsoil with its installations. The distribution of water by piping would not arrive in Barcelona until twenty years later. In addition, the whole system of contracts and relations with the City Council had to be invented, and would later become a precedent for other municipalities. The legal framework for joint-stock companies was not clear either, the first law for public limited companies did not appear until 1848, after the excesses of 1846 and 1847 on the Madrid stock exchange.

Finally, the technical studies also faced delays: the necessary technicians did not exist, since the engineering career did not appear until 1850. However, when engineering as a course of study was established, it should be noted that the first official competence of the new graduates was the verification of gas meters. It was a time when mines still belonged to the Crown, not to the government, and when the iron and steel industries did not exist and wouldn't appear until 1852.

It was at this time and in this context that some citizens, despite all the difficulties and shortcomings mentioned above, left their homes to set up a gas company, which would be the first gas company in Spain, the Sociedad Catalana para el Alumbrado por Gas.

Founders and Shareholders

Among the first shareholders present at the founding of the company, apart from the previously mentioned Charles Lebon, were three of the sons of Pedro Gil Babot and six other people, whose profiles are presented below.

43. According to article 9.1 of the bank's articles of association of May 1, 1844. Banco de Barcelona (1894), p. 103.

Pedro Gil Serra

Pedro Gil (Tarragona, 1814 - Cannes, 1867) was married to Josefina Moreno de Mora and they had two children. He was primarily involved in the banking business, having established a bank in Paris (1846), was one of the founders of the Caja de Ahorros y Monte de Piedad de Barcelona (1844), and was a promoter of the Real Compañía de Canalización del Ebro (1852), and had relations with Eugenia de Montijo and Isabella II. He was one of the founders of the Sociedad Catalana para el Alumbrado por Gas (1843) of which he was appointed banker.

During 1842, he took the necessary steps to locate and recover the remains of the kings of Aragon, stolen in 1836 from the monastery of Poblet. He successfully achieved this in January of 1843, and made the timely transfer and return of the remains.

José Gil Serra

José Gil⁴⁴ (Barcelona, 1815-1877) was the son of Pedro Gil Babot who dedicated the most years and efforts to Barcelona gas. He studied at the Escuela de Náutica de la Junta de Comercio de Barcelona, and obtained his degree as a third commercial pilot at the age of 19. His career began as captain of the brigantine Cristina on the Barcelona-Havana route between 1835 and 1837. Later he completed his training working in the trading and banking house of Agurrisolarte and Murrieta in London (1837-1840).

In 1843 he was one of the founders of the Sociedad Catalana para el Alumbrado por Gas, where he served as manager until 1845, when he resigned from his post. In 1848 he was a member of the Board of Directors, but resigned to present to the General Meeting of Shareholders a proposal for mixed management of the company, in competition with Lebon; he was awarded the contract, and acted as managing director of the company until his death in 1877. José Gil was also responsible, as an expert, for the construction of the Sabadell gasworks in 1851, and the following year for that of Terrassa.

In search of new horizons, in 1866 he became a shareholder in the Sociedad Anónima para el Alumbrado de Gas in Seville, which was set up by the Swiss General Bank the previous year. This company was subsequently acquired by the Sociedad Catalana in 1871. He also built and operated the Córdoba gasworks⁴⁵ and acquired coal mines in Fuenteovejuna, Belmez and Espiel. In 1873, he also became

44. Fàbregas (2011b), p. 834

45. Fernández-Paradas (2009), pp. 36-40; Fàbregas (2013d), pp. 46-47.

a limited partner, together with his brother Claudio, of the Sociedad Federico Ciervo y Cía. de Barcelona (founded in 1865) and dedicated to the manufacture of gas meters, as well as of the Seville branch of the same company.

In 1855, he was appointed substitute consul of the Tribunal de Comercio de Barcelona, and in 1866, honorary member of the Ateneo Catalán de la Clase Obrera de Barcelona, an institution created in 1861 by a group of progressive liberals for the diffusion of culture in the working class. Finally, he was named director of Lloyd's Catalan maritime insurance company in 1872.

Pablo Gil Serra

Pablo Gil (Barcelona, 1816 - Paris, 1896) made his first trip to Paris in 1834, on his way to London, where he worked like his brother José in the offices of Agurrisolarte and Murrieta, a trading house and bank. He was one of the founders of the Sociedad Catalana para el Alumbrado por Gas in 1843 in Barcelona.

Pablo Gil Serra's main activity was to work with his brother Pedro in the banking house the latter had established in Paris in the mid-1840s. After Pedro's death in 1867, he headed the bank until his death in 1896.

Pablo Gil is remembered because he left it in his will that after his death the banking house in Paris should be liquidated, and that with the resources obtained several testamentary legacies should be made, including a very important one for the construction of a civil hospital in Barcelona, which gave rise to the well-known Hospital de Sant Pau⁴⁶, an incomparable work of Catalan modernism by the architect Lluís Domènech i Montaner.

José Farrán

He was appointed agent cashier in the first organization of the Sociedad Catalana. He was a member of the Board of Directors during 1845 and 1846. When he joined the mixed administration in 1849, he was appointed comptroller to supervise the performance of the director on behalf of the company.

Carlos Torrents Miralda

Carlos Torrents (Manresa, 1792 - Barcelona, 1860) was a partner with his brother Pablo of the firm Torrents Miralda, one of the most important firms in Catalonia in trade with the Americas, with an office in Mexico.

46. García Martín (1990), pp. 22-53.

Carlos was one of the founders of the Sociedad Catalana para el Alumbrado por Gas, while his brother Pablo was one of the founders of the Caja de Ahorros y Monte de Piedad de Barcelona, as well as a member of the Cortes in Madrid from 1836 to 1843.

The Torrents Miralda brothers were from the silk company Pau Miralda y Compañía de Manresa. In 1826, by the river Cardener on its passage through Manresa, this company built what is still known as the *fàbrica dels panyos*⁴⁷, a building that still exists, and which has been described as the oldest factory in Catalonia and Spain that has been essentially maintained with its original characteristics. It consists of several floors with symmetrically placed windows. Later, the now vanished Manresa gasworks was located on the neighboring plot of land.

Carlos Karsniki

He was a Polish employee of Lebon; as an engineer he was responsible for the first construction activities of the gas exploitation in Barcelona, together with another Polish engineer, F. Nabelak. The French engineer Léger Marchessaux replaced Karsniki at the Barcelona gasworks in 1843.⁴⁸

Karsniki was in the constitution in Perpignan of the Compañía General de Minas de Cataluña y Aragón, together with Charles Lebon, Pedro Gil, Lorenzo Garcias and others on March 30, 1842, of which he was appointed general engineer.

Finally, in 1846 he was in Seville carrying out negotiations on gas lighting⁴⁹ on behalf of the Englishmen Manby and Partington, who were the ones who definitively installed the Madrid gasworks.

Antonio Tintó

Landowner and consignee, resident at Calle Escudellers 75 in Barcelona, Tintó was secretary of the first Administrative Board of the Sociedad Catalana in 1843. He was reappointed in 1845 and 1846, by which time it was called the Board of Directors.

The attractiveness of the investment and the security of the type of business, as it was the first public service concession in Spain, roused great interest among the citizens of Barcelona, such that in February of 1845, just two years after its

47. Cloth factory.

48. Arroyo (2000), p. 56.

49. González García (1981), p. 9.

constitution, the number of shareholders had risen to 224, a very important figure for the period, and which shows the close links existing since its inception between the Sociedad Catalana and the surrounding civil society that embraced it.

It is curious to note that among the shareholders were fifteen women, representing approximately 7% of the total. In a period such as the mid-19th century, specifically in 1845, finding women as shareholders in a company is truly surprising, and is another indicator of the presence of Catalan women in the world of business, stimulated by the clearly progressive peculiarities of Catalonia's traditional civil law, which through the system of separation of assets in marriages granted equality in economic activities and in the administration of assets, regardless of gender.

On the other hand, the shareholders also included prominent people from society at the time, who were interested in the new company and its activities. Apart from the founders, already mentioned and commented on, among the investors were figures such as: Juan Güell, José Amell Carbonell, Joaquín Martí Codolar, José Clot Baradat, Esteban Gatell, Jayme Badía and Manuel de Compte, who at one time or another also appeared on the Board of Governors of the Bank de Barcelona. If we compare it with the Board of Governors of the Caja de Ahorros y Monte de Piedad de Barcelona in 1853, we also find figures who coincided, such as the Marquis of Quadras, the Marquis of Alfarrás⁵⁰ and again Manuel de Compte.

In sum, the social involvement of Barcelona and its surroundings accompanied the Sociedad Catalana from the very beginning, as a company rooted in a territory and providing a basic service to the community. Over the years, this sense of mutual identity developed and strengthened and made possible support in development and growth.

Attracting Customers

In Barcelona, after the City Council, the first customers of private lighting were the shopkeepers of the main shopping streets of the city at that time, who could thus keep their service open to the public for more hours, while at the same time enhancing the appearance of their establishments with the new light. They distinguished themselves in this way from the competition and improved their capacity

50. The Marquis of Alfarrás was the 16th largest taxpayer of the province of Barcelona. *Boletín Oficial de la Provincia de Barcelona* (14-05-1852).

Table 5. Sociedad Catalana para el Alumbrado por Gas. First customers of gas in Spain (1842-1843)

Number	Name	Profession	Street
1	City Council of Barcelona	—	—
2	Francisco Antich	Tailor	Escudellers
3	Buenaventura Roig	Shopkeeper	Call
4	Hotel 4 Naciones	Hotel	Rambla
5	Juan Doument	Hardware	Escudellers
6	Carlos Vicens	Tailor	Escudellers
7	Joaquín Monrás	Tailor	Escudellers
8	Gervasio Villalonga	Hardware	Escudellers
9	Joaquín Verdaguer	Bookseller	Rambla
10	Alba y Cía.	Confectioner	Call
11	Jayme Costa	Confectioner	Escudellers

Source: PFHA.SCAG. *Libro Registro Clientes, No. 1 (1842-1947)*.

to attract customers. Gas lighting was also soon installed in the houses of the bourgeoisie, as well as in shows of public entertainment, where it enhanced the splendor of these works and performances with new and unusual lighting possibilities (Table 5).

As one can see, the city's shopping center was on Calle Escudellers, which at that time connected Calle Ample with La Rambla, and was, as Víctor Balaguer said, "One of the busiest streets in Barcelona and unfortunately one of the narrowest". The Hotel 4 Naciones, the first hotel establishment on the list of gas customers, still exists on the lower section of Barcelona's Rambla.

The courage of the first customers of gas lighting deserves mention, even more so given that they were shopkeepers, in a society that was eminently conservative and little given to the mechanisms and dynamism of evolution, modernity and change in social customs.

Also significant, in addition to these innovative users, was the way and pace at which the new lighting penetrated the private homes of the bourgeoisie, as well as the different institutions of the city, both political and commercial, and in leisure establishments (Table 6).

Prominent people and important institutions of the city, but also theaters and the operahouse, and obviously the most advanced factories, quickly became clients of the Sociedad Catalana, as the installation of pipes overcame obstacles and

Table 6. Sociedad Catalana para el Alumbrado por Gas. Important customers (1843-1848)

Year	Name	Profession
1843	Nicolás Tous	Manufacturer, founder of La Maquinista
1844	José Plandolit	Property owner, founder of the Banco de Barcelona
1844	José Xifré Casas ⁵¹	Property owner, builder Porxos d'en Xifré
1844	Pedro Gil	Banker, founder of the Catalan Soc.
1844	Barón de Maldá	Property owner
1844	Muntadas Hermanos	Manufacturers, later La España Industrial
1844	Agustín Peyra Mach	Consul of Prussia
1844	Jefe político	[Civil Governor]
1844	Jaime Safont ⁵²	Banker
1845	Casa de la Llotja	—
1845	Cía. Barcelonesa	Manufacturers
1845	Café de las 7 Puertas	Restaurant
1846	Diligencias de Oriente	—
1846	Valentín Esparó	Manufacturer, founder of La Maquinista
1846	Francisco Bacigalupi	Property owner
1846	Marquis of Sentmenat ⁵³	Property owner
1846	Batló Hermanos	Manufacturers
1846	Capitanía General	—
1846	Gran Teatro del Liceu	—
1848	Teatro Principal	—

Source: PFHA.SCAG. *Libro Registro Clientes, No. 1* (1842-1947).

advanced through the complex network of Barcelona's streets of that day. Some of these initial clients still exist, such as the 7 Portes restaurant, the Llotja de Barcelona, the Liceu, the Teatro Principal, etc.

A more in-depth look can be made of one of the most distinctive establishments, the current 7 Portes restaurant in Barcelona⁵⁴, inaugurated in 1836 as the

51. José Xifré Casas was in 1852 the third largest taxpayer in the province of Barcelona. *Boletín Oficial de la Provincia de Barcelona* (14-05-1852).

52. Jaime Safont was in 1852 the largest taxpayer in the province of Barcelona. *Boletín Oficial de la Provincia de Barcelona* (14-05-1852).

53. The Marquis of Sentmenat was in 1852 the tenth largest taxpayer in the province of Barcelona. *Boletín Oficial de la Provincia de Barcelona* (14-05-1852).

54. Currently owned by Francisco Solé Parellada, whom we thank for the information. The name comes from the fact that it had seven doors for the entrance of customers, and an eighth for service. See <https://7portes.com> [consulted 11-02-2018].

Table 7. Café de las 7 Puertas. Lights for work days (1845)

	Circular		Split burners by number			
	12 holes	16 holes	2	3	4	5
Main dining hall	12					
Hall of Nations		2				
Corridor leading to the Hall of Nations		1				
Interior green hall		1				
Counter mezzanine		1				
Passageway	1					
Large mezzanine hall		3				
Commons, lower floor				1		
Passageway leading to the downstairs storage area					1	
Confectionery, lower floor						1
Main washroom, lower floor						1
Main kitchen, lower floor				1		1
Lower floor porcelain and glass tank			1			
Mezzanine staircase			1			
Porcelain tank, mezzanine floor						1
Common, mezzanine floor			1			
Piano					1	
Staircase leading from the living room to the mezzanine floor			1			
TOTAL	13	8	4	2	2	4

Source: Duran i Bas (1861), p. 151.

Café de las 7 Puertas, under the direction of Josep Cuyàs, in the impressive building known as the Porches de Xifré, built in the style of the Rue de Rivoli in Paris with porticoed facades. The location was ideal due to its proximity to the royal palace, the stock exchange and the grain exchange, the commercial center of the city at the time.

The gas contract for lighting was signed on October 2, 1845 between the administrator of the Sociedad Catalana, P. Farrán, and Josep Cuyàs.⁵⁵ This replaced a previous contract of the same year, such that instead of paying by volume with a meter, the gas was paid per hours of use with strict accounting of the lighters used, which are shown in the attached tables (Table 7).

55. Duran i Bas (1861), pp. 151-152.

Table 8. Café de las 7 Puertas. Additional lights for public holidays (1845)

	Circulares		Split burners by number			
	12 holes	16 holes	2	3	4	5
Skylight passageway	1					
Hall of Nations		2				
Interior green hall		3				
Counter mezzanine		2				
Green mezzanine hall		4				
Green hall washroom, lower floor						2
Room in front of the large storage space				2		
Yellow room, mezzanine					2	
TOTAL	1	11		2	2	2

Source: Duran i Bas (1861), p. 152.

It is curious to learn through a contract for gas lighting of all the rooms of a mid-19th century establishment, which still exists; moreover, according to the number and type of lights we can imagine the size and need for elegance of each room. In addition, on holidays, lights and spaces were added, as these were the days attracting the most customers (Table 8).

The company was contractually guaranteed free access to the facilities, as well as the sealing of all burners not listed in the contract. The agreed price for the related lights was fifty *duros* per month, with lighting from dusk to ten o'clock at night. The necessary additional lights, if any, would be charged according to the lighter: 12 holes (7 *maravedíes* per hour), 16 holes (8.5 mv/h), opening number 2 (5 mv/h), number 3 (7 mv/h), number 4 (9.5 mv/h), and number 5 (10 mv/h). It was a simple contract, but one with all the information and provisions necessary for the service.

The Governing Bodies

The company's Articles of Association stipulated that "during the work necessary to carry out the company", i.e. the construction of the gasworks, and compliance with the agreements with the City Council on the laying of pipes and the deployment of lanterns, the authority would be vested in the *businessman* (Charles

Table 9. Sociedad Catalana para el Alumbrado por Gas. Administrative Board (1843)

Name	Position
Félix Ribas	Chairman
Charles Lebon	Founder
Lorenzo Garcias	Principal assistant founder
Pedro Gil Serra	Banker
Ramón Ferrer Garcés	Member of the Board
Manuel José de Torres	Member of the Board
Antonio Tintó	Secretary

Source: NFHA.SCAG. *Escritura de Constitución de Sociedad o Contrata social y Reglamento de la Sociedad Catalana para el Alumbrado por Gas* (28-01-1843).

Lebon), who would be supervised by an Administrative Board (equivalent to the current Board of Directors); this Board would subsequently govern the company, whose composition and positions were defined in detail in the Articles of Association of the company (Table 9).

Shortly after, in the same year 1843, the Administrative Board became the Board of Directors, presided over by Félix Ribas. With this, the corporate organization assumed the form it would maintain for many years, with a Board of Directors that was the governing body that controlled the administrator or manager. Subsequently, a Supervisory Board appeared with functions of oversight of the Board of Directors, until finally, at the beginning of the 20th century, this entire organizational and representation scheme was replaced with a single Board of Directors, as the governing body, and a management, as the executive body.

The management structure was also defined in the Articles of Association, with a director, on whom depended an engineer whom Lebon reserved the right to appoint and a agent cashier who was necessarily a shareholder. Finally, it was

Table 10. Sociedad Catalana para el Alumbrado por Gas. Management structure (1843)

Name	Function
José Gil Serra	Administrator
Léger Marchessaux	Engineer
José Farrán	Agent cashier

Source: NFHA.SCAG. *Escritura de Constitución de Sociedad o Contrata social y Reglamento de la Sociedad Catalana para el Alumbrado por Gas* (28-01-1843); Arroyo (2000), p. 56.

established that all employees of the company had to be Spanish, although the engineer was French in the early years (Table 10).

Positions of influence were clearly maintained among the first managers of the company: Charles Lebon, appointed business owner with the right to appoint the engineer, and the Gil family, who appeared with Pedro Gil Serra as banker of the company, and his brother José as the first administrator. However, new figures also appeared, as mentioned below.

Félix Ribas Solá

He was the first chairman of the Administrative Board (1843) and chairman of the Board of Directors for many years (1843-1844, 1847-1864).

Ribas was an architect by profession and had his residence at Calle Baja de San Pedro 9. To put this in the proper context, it should be noted that in the city of Barcelona in 1849 there were only 23 registered architects.⁵⁶

Probably the first shareholders of the Sociedad Catalana believed that to oversee Lebon's pipe-laying activity, the best chairman would be a shareholder who also had knowledge of construction and who better, in this sense, than an architect.

Félix Ribas was a member of the Partido Progresista (Progressive Party), which elected him to its provincial deputy representation four times: twice for Vic (December 1840 - July 1843) (August 1854 - October 1856), and twice for Barcelona (March 1860 - March 1862) (November 1863 - until his death in January 1864).

At the first General Meeting of Shareholders of the Sociedad Catalana after his death, a heartfelt word of thanks was dedicated to him: "Mr. Félix Ribas. Chairman of this Board, almost since the creation of the company; and as such, also chairman of its assemblies, he always displayed the greatest zeal and the significant qualities that so distinguished him, with the aim of promoting social interests, which his conciliatory character always sought to harmonize with those of the public. In critical moments; in the complicated questions that had to be resolved, his evident talent and high standards soon led him to the most suitable solution, which, however, he would only propose after having tested it in the crucible of his unyielding conscience. In a word, he was for twenty years a laborious and just

56. One of the professional projects realized by Félix Ribas was the reconstruction of the university building, located in the convent of the Carmelites on Calle de los Ángeles, budgeted at 5,403,555 *reales de vellón*. Funding problems, however, prevented its implementation. Vergès (1872), p. 127.

administrator of the company, to whose prosperity he effectively contributed with his brightness".⁵⁷

Lorenzo Garcias

Garcias⁵⁸ was a French citizen, born near the Spanish border, who had established good relations with the Spanish exiles in Paris during the Moderate Decade of Ferdinand VII. He was awarded the Legion of Honor and the Order of Charles III, and was also a member of parliament in Paris.

He was the main promoter of the *Compañía General de Minas de Cataluña y Aragón*, founded in Perpignan on March 30, 1842, with the aim of developing mining operations in the area of Sant Joan de les Abadesses. Likewise involved in the partnership were the Gil family as bankers, and Charles Lebon, who was responsible for technical management, as well as Carlos Karsniki as general engineer. The company ended badly, with arguments and lawsuits between the partners, many of them also involved in the *Sociedad Catalana para el Alumbrado por Gas*.

Ramón Ferrer Garcés

Ramón Ferrer (Aitona, Lleida, 1803 - Barcelona, 1872) was a doctor and the first professor of legal medicine, toxicology and public hygiene at the Faculty of Medicine of the *Universidad de Barcelona*; he published various works in his specialty.

Politically he was a supporter of progressive liberalism, and thus during the first Carlist war he fought against the troops of the pretender Carlos María Isidro. He was deported to Havana for the acts of disturbance of public order that occurred in Barcelona on January 5, 1836, although he was almost immediately elected as a member of the *Cortes* for the province of Lleida (October 1836).

He served as mayor of Barcelona during the progressive period of 1841. He began his mandate on January 1, 1841 to replace José Maluquer Montardit, who had been appointed only a few months earlier, on June 11 1840; Ferrer was replaced a few months later, on November 17, 1841, by Tomás María de Quintana Badía. It should be noted that he was the mayor of Barcelona in July of 1841 when the City Council awarded the first gas street lighting contract to Charles Lebon.

Regarding his public career it should also be remembered that he was president of the *Ateneu Barcelonés* and vice-president of the *Academia de Medicina de*

57. NFHA.SCAG. *Asamblea general de accionistas* (04-06-1864).

58. Rodrigo Alharilla (2010), pp. 101-110.

Barcelona (Academy of Medicine of Barcelona), and representative member of the Congreso de los Diputados in the legislature of 1836-1837 and 1839.

On the occasion of his death, he was remembered at a solemn commencement ceremony of the academic year at the Universidad de Barcelona, the first such ceremony to be held in the university's new location on the Plaza de la Universidad: "D. Ramón Ferrer y Garcés, professor of toxicology, for many years in charge of the course of toxicology, which is so important, especially in the current state of our society, to discovering and preventing crimes whose perpetration could lead to the same advances in science, with the hope that they should remain hidden, by virtue of the secret with which they were consummated, the murderer feigning vigilance and care for the health of the victim. D. Ramón Ferrer y Garcés, who with noble ambition and without neglecting the duties of teaching, nor the exercise of his medical-surgical profession, had been honorably present in political life, either occupying a seat in the City Council of this city, or in the congress of deputies."⁵⁹

Manuel José de Torres

Manuel José de Torres (Barcelona, 1805-1873) was a lawyer, educated at the Universidad de Barcelona and Universidad de Alcalá. Later, he held the chair of Roman Law and was appointed consultant to the Tribunal de Comercio and the Batllia del Reial Patrimoni.

Regarding Manuel José de Torres, Duran Bas said: "The judicial counselor is not found in him, but rather he is the personification of the lawyer of the time of transition. Torres argues more strongly for the application of modern laws than for the issues raised by old legislation." He was elected dean of the Colegio de Abogados de Barcelona (Barcelona Bar Association) in 1864, a position to which he was reelected annually until 1873.

Geo-strategy in the 19th century

One might think that society in the mid-19th century was village-based and local and burdened with only minor responsibilities; clearly, most people fit into such a framework. However, a small section of society was made up of entrepreneurs who

59. Vergés (1872), p. 124.

undertook challenges that were not at all easy, who acted in global environments, who took advantage of the greatness and geostrategic easements of different countries, and who were immersed in a world of relationships that served as a support for achieving results. In our current history, an example of these behaviors can be found in the actions of Lebon, the Gil family, Ferdinand de Lesseps, Empress Eugenia de Montijo and Queen Isabella II, with activities carried out between Spain, France, Egypt and the Ottoman Empire, and with interlinked relations between the various protagonists.

The influence of the European powers on Spanish politics in the first half of the 19th century was significant, given that Spain no longer occupied a position of importance in international affairs and thus instead of conditioning was now conditioned by global approaches. The position of Austria, Prussia and Russia against the advance of liberal ideas lent support to Carlist ideas. The Isabelline view, meanwhile, was supported by France and England, countries more in favor of modernizing the state.⁶⁰

French and English attempts to influence Spanish politics were constant, including positioning the interests of these countries at different times. The Mendizábal and Espartero eras were clearly more favorable to British interests. Whereas, in contrast, the positions of the regent Maria Christina and Queen Isabella II in exile in Paris were more influenced by French concerns.

In the Mediterranean region, movements were constant, with a British position of support for the Ottoman Empire, and a French approach to increasing its influence by way of the occupation of Algeria in 1830, and mainly with the promotion of Mehmet Ali as viceroy of Egypt⁶¹, an operation carried out by the French representative in that country, the Frenchman Mathieu de Lesseps⁶², although Egypt in theory depended on the Sublime Porte.⁶³

On March 8, 1841, General Espartero was appointed the sole regent of Spain, and a few months later, in May, Charles Lebon presented his bid at the gas lighting auction in Barcelona called by the City Council. Lebon's only experience in the gas lighting business up to that time was in his native town of Dieppe, in Normandy,

60. Armario (1984), pp. 137-142.

61. Mehmet Ali was a Macedonian of Albanian origin who was a member of the Kavala volunteers sent by the Ottoman Empire to recover Egypt after Napoleon's departure. His dynasty ruled Egypt from 1805 until the abdication of King Faruq in 1952.

62. Mathieu de Lesseps was a French diplomat, father of Ferdinand de Lesseps, builder of the Suez Canal.

63. Name given in diplomatic circles to the government of the sultan of the Ottoman Empire located in Istanbul.

France, in 1838. All of a sudden, with no apparent continuity, without any greater knowledge of the trade, he appeared in Barcelona⁶⁴ with some French colleagues and a Polish engineer; it was clearly another country, another scale of city, another environment. Perhaps it should be brought up that Lebon had at one time helped to enthrone the King of France, Louis Philippe, and had received several decorations and pensions for it, and had also been accused of belonging to the French secret service.⁶⁵ Maintaining and increasing French influence in a city like Barcelona at the time May of have had its importance in the geostrategic context of influences in the Mediterranean and Spain.

As if that were not enough, in 1842 Ferdinand de Lesseps was appointed as the new French consul in Barcelona, with a long diplomatic career, including his time as consul or vice-consul in Alexandria and Cairo (1832-1839), when Viceroy Mehmet Ali, who had been enthroned by Lesseps' father, entrusted him with the education of his last son, Mehmet Said, future Viceroy of Egypt (1854-1863).

In the Barcelona uprising against Espartero in November of 1842, which ended with the bombing of the city by General Van Halen, Spanish diplomatic reports involved Lesseps, although this was later proved to be false.⁶⁶ Lesseps did play an exemplary role as a mediator in the defense of French citizens and likewise of Barcelona residents who had been arrested and imprisoned.⁶⁷ He continued his relationship with the city for years, was consul until 1848, then promoted to ambassador to Spain (1848-1849), and finally left the diplomatic career shortly after. However, in 1859 he returned to Barcelona, to found the current *École Française Ferdinand de Lesseps*, and thus helped to spread French culture and language in the city.⁶⁸

In short, from 1842, Charles Lebon and the Gil family coincided in Barcelona, in the *Sociedad Catalana para el Alumbrado por Gas*, while Ferdinand de Lesseps led

64. Barcelona is 1,200 kilometers from Dieppe.

65. In 1838, the newspaper of his city, the *Vigie de Dieppe*, insinuated that Charles Lebon was a spy paid by the French police, based on his constant trips to Paris, and some commercial and family advantages he seemed to have received from the authorities. Lebon filed a lawsuit in court and received a ruling in his favor, and against his opponents. See: *Compte-Rendu du Procès de M. Lebon contre MM. Levasseur, gérant, et Mermet, rédacteur en chef de la Vigie de Dieppe*. Dieppe: Levasseur, 1838. Strangely enough, the report of this process was republished and translated into Spanish in Barcelona in 1850 by publisher's Oliveres H.

66. Armario (1984), p. 161.

67. Which led to the grateful city dedicating an important public square to him in 1905.

68. This school, which is still in operation today, is the oldest French school on the Iberian Peninsula. At the beginning of the 20th century, part of the textile bourgeoisie of Barcelona still sent their children to this school, who then continued their studies directly in France, with the consequent approach and closeness to French culture.

an active life in the city, even attending a meeting of the Board of Directors of the gas company.

In the years immediately following, Isabella II (1843) was crowned queen of Spain, while the first-born of the Gil family, Pedro Gil Serra, opened a bank in Paris (1846).⁶⁹ Almost simultaneously, Europe found itself in the throes of the 1848 Revolution, which led to the overthrow of Louis Philippe in France and the proclamation of the Second Republic. Elections were then called in France, which, oddly, were won by Charles Louis Napoleon Bonaparte, the Emperor's nephew, leading to his appointment as president of the Republic.

Only two years later, in 1853, Charles Louis Napoleon Bonaparte created the Second Empire as Napoleon III and married the Spanish noblewoman Eugenia de Montijo. To sum up, Eugenia de Montijo was empress of France, she was a relative of Ferdinand de Lesseps⁷⁰, and had as a banker in Paris Pedro Gil Serra in 1851.⁷¹ The threads of history continued to weave their story.

At the same time, Isabella II, Queen of Spain, granted recognition in Madrid to Pedro Gil' father, Pedro Gil Babot, and named him Knight of Grace of the illustrious Military Order of Saint John of Jerusalem, as well as Commander of the Royal Order of Isabella the Catholic.

Matters accelerated with the death of the viceroy of Egypt on July 13, 1854, who was succeeded by Mehmet Said, Ferdinand de Lesseps' former student. The Frenchman moved quickly and was already in Egypt on November 7 to push forward his Suez Canal project. It took him only 23 days to obtain the concession from the new viceroy, specifically, on November 30, 1854. In a few months Lebon, always vigilant, contacted Lesseps and asked him to make arrangements on his behalf with Viceroy Mehmet Said to be granted gas lighting concessions in the main cities of Egypt. Lesseps followed through, although with no apparent

69. Rodrigo Alharilla (2010), pp. 113-114.

70. Ferdinand de Lesseps was Eugenia de Montijo's second uncle, more precisely, he was the cousin of Eugenia's mother: Maria Manuela Kirpatrick-Closebourn Grivegnée.

71. The closeness of the relationship can be deduced from the following paragraph of a letter from the Countess of Montijo to her sister, the Duchess of Alba, written in Paris on October 26, 1851: "I learned from the newspapers that James [the Count of Alba] had won the cup; I had seen it before it was sent. M. Gil, one of our friends, is the one who was in charge of having it made, and I will tell you that it can be used as a sauce pot, removing the lid; he instructs me to tell you". Llanos (1944), pp. 116-117.

short-term result, according to his letter of September 30, 1855; the circle, however, was closing.⁷²

Meanwhile, the Gil family's banking house continued to expand its influence in Paris, both with clients of the Spanish aristocracy, such as the Duchess of Sotomayor and the Marquis of Casa Valdés, and with its agency relations with the bourgeoisie of Barcelona. In 1857, in the diplomatic archives of the Spanish embassy, Pedro Gil Serra is referred to as the honorary consul of Her Gracious Majesty in Paris, in reference to Isabella II.⁷³

In December 1858, the *Compagnie Universelle du Canal Maritime de Suez* was created, and work began in April of the following year, which would take about ten years to complete. Viceroy Mehmet Ali died in 1863. He was succeeded by his heir, his nephew Ismail Pacha, who granted the gas lighting concessions for Alexandria and Cairo to Charles Lebon in 1865 after a ten-year wait.⁷⁴

In the following years, a number of circumstances changed: Pedro Gil Serra died and was replaced in the Paris banking house by his brother Pablo (1867); in Spain, the 1868 revolution, known as the Glorious, forced Isabella II to go into exile and she obviously chose to live in Paris.

Finally, on November 17, 1869, the Suez Canal was officially inaugurated and Empress Eugénie represented France at the ceremony. As Llanos states: "The Suez Canal, which was largely considered to be Eugénie's personal work, was to be inaugurated because of the determined and persevering protection she gave to the great project of her relative Lesseps from its very start".⁷⁵

The French debacle in the Franco-Prussian war, however, brought about the advent of the Third Republic in France and the exile to England of Napoleon III and Eugenie in 1870, and the death of the emperor in 1873. However, Eugenia's relations with Lesseps would continue, when the latter was already focused on the

72. Letter from Ferdinand de Lesseps to Charles Lebon dated September 30, 1855: "I received your letter on time telling me about gas lighting in Egypt. I spoke to the viceroy, whom I didn't find disposed. If there is any reason to take up the proposal again in the future, you can be sure that I will not let the opportunity pass and that I will inform you of what needs to be done. I will return to Paris on October 15 and I will be delighted to see you". Lebon et Cie. (1947), pp. 290-291.

73. Rodrigo Alharilla (2010), pp. 115 y 123.

74. The story goes that, in the case of Cairo, Lebon had forgotten about the subject until, with only one month to go before the deadline for starting the lighting, he remembered it, and appeared in Cairo and "in a few weeks he built an oven near the Palace, connected it with a mediocre gasometer, installed a small pipeline leading to a single gas burner placed on the stairs of the Palace of the Viceroy and... demonstrated the validity of his concession". Lebon et Cie. (1947), pp. 15-16.

75. Llanos (1944), p. 52. To celebrate the inauguration, Giuseppe Verdi's opera *Aida* was premiered on December 24, 1871 at the Khedive Opera House in Cairo.

Panama Canal.⁷⁶ Not much later, in 1882, Britain occupied Egypt to protect its main trade route, the one linking the mother country with India, through the Suez Canal.

As late as 1893, the Gil banking house in Paris granted a loan of 100,000 French francs to Isabella II in exile.⁷⁷ The banking house closed permanently in 1896 due to the death of Pablo Gil, who in his last wishes left a legacy to build a hospital in Barcelona. The desired hospital became a reality with the construction of the Hospital de Sant Pau, in the modernist style, by the architect Lluís Domènech i Muntaner.

The Creation of an Industry

Once the company was set up, work began at a good pace to complete the gas pipelines and gas streetlamps that had been committed to in the contract with the City Council. The commitment was to lay 30,000 pipes (equivalent to approximately 24,000 meters), the initial 22,000 of the bases, plus an additional 8,000 added in the auction.

Almost immediately, internal problems concerning the partnership with Charles Lebon began. The Board of Directors reprimanded him because it felt the *businessman* was spending too little time on the work needed to start up and develop the gas business in Barcelona, due to his constant trips to other cities in search of new businesses and new activities, and also for not agreeing to provide straightforward explanations about his actions. All of this led to delays in the implementation of business programs and, therefore, in the economic activity of the company and in the effective takeover of the shareholders, according to the provisions of the Articles of Association. Lebon justified the delays by blaming the consequences of the bombardment of the city by Espartero's army in late 1842.

However, Lebon wielded the powers granted to him by the Articles of Association, which stated that: "The management and administration of the company and the use of the corporate signature during the execution of the work necessary to

76. Letter from the Countess of Montijo to her mother, written in Camden Place on June 14, 1879: "Yesterday I saw Lesseps; he came to London with a commission, and he is leaving tomorrow. In December he will leave for the Isthmus of Panama. He has begun its opening, like the one in Suez. Will he have time to finish it? God only knows! Although he is very young, the climate is very unhealthy and very different from what he is accustomed to in Africa." Llanos (1944), p. 377.

77. Rodrigo Alharilla (2010), p. 123.

carry out the company and until they are fully completed, will be the responsibility of the partner Mr. Carlos Lebon, as sole person in charge of them".⁷⁸

The situation, with its ups and downs, remained within these parameters. There were clearly tensions and differences of approach, as can be seen in the 56-page document, published and presented by Lebon to the 1844 General Meeting, in which he set out his views and complained of interference by the rest of the shareholders in his work. He states, for example: "Some people, truly or supposedly interested in the gas company, mattering little in this case whether they really are or not, [...], meet in secret discussion, without attempting to establish any kind of relationship with the one who exercises all the authority, about whom they try to immerse in serious accusations under pretexts more or less founded, welcoming with a truly hostile eagerness all those voices that circulate attacks on his honor".⁷⁹

The growth in consumption was relatively slow; on June 30, 1844, almost eighteen months after the incorporation of the company, 1,258 lights had been contracted, of which 507 corresponded to public lighting, and only 751 to private lighting. The slowness of the progress can be attributed to different reasons: on the one hand, it was impossible to win customers if the pipelines that were slowly advancing along the streets of the city were not yet installed; on the other hand, Lebon, rather than being a businessman concerned about the growth of his business, was more of a go-getter of concessions which he then transferred to a company created ad hoc, which rewarded him with shares of the new company; nor was it easy to convince the people of Barcelona at the time to change their habits; and finally, Lebon's focus at this time on the project of Valencia did not help either.

In spite of all the problems and difficulties and internal disagreements, finally on July 1, 1846, the company fulfilled its commitments to the City Council by installing the prescribed amount of pipelines.

During these years the Board of Directors was renewed every year by election on the day of the General Shareholders' Meeting. However, the position of chairman was highly stable: Ramón Adzerias, a lawyer residing at Calle Avinyó

78. NFHA, SCAG. *Escritura de Constitución de Sociedad ó Contrata social y Reglamento de la Sociedad Catalana para el Alumbrado por Gas* (28-01-1843).

79. Lebon (1844), p. 19. The booklet began with the Latin quote: *Res, non verba*, which can be translated as: "Facts, not words", which clearly exhibits the mood and approach to reality of Charles Lebon.

Table 11. Sociedad Catalana para el Alumbrado por Gas. Chairmen of the Board of Directors (1843-1864)

Chairman	Period
Félix Ribas	1843-1844
Ramón Adzerias	1845-1846
Félix Ribas	1847-1864

Source: NFHA. SCAG. *Junta Directiva* (1843-1864).

16, replaced the architect Félix Ribas and later, in 1847, the latter returned to the chairmanship (Table 11).

On another note, and as a precursor to the events that would take place later, the Gil family, whatever the motivations, distanced themselves from the company in 1845, when José Gil Serra resigned from his position as administrator. He was replaced by the agent cashier Pedro Farrán, whose position as agent cashier was filled in turn by Juan de Pérez.

José Mansana Dordán, who from 1877 would be the managing director of the company for many years, began to work in the company at this time, specifically in 1845. His abilities must have been evident, for when the agent cashier went to another job in 1847, the administrator Farrán proposed to the Board of Directors the appointment of Mansana as agent cashier, but the Board considered that “his youth deprived him of the mature character that would suit an employee of his level in a company such as that of gas”⁸⁰, and appointed Ignacio Alabán. José Mansana’s time would come later, thirty years later.

80. NFHA.SCAG. *Junta Directiva* (15-06-1847).

Table 12. Sociedad Catalana para el Alumbrado por Gas. Contracted lights (1844-1849)

Type of lighting	Number of lights 30-06-1844	Number of lights 01-07-1849	Increase
Public lighting	507	698	191
Private lighting	751	7.027	6.276
TOTAL LIGHTS	1.258	7.725	6.467

Source: NFHA.SCAG. *Memoria leída en la Asamblea General de Accionistas* (1850 and 1857).

It has been pointed out that gas appeared in Barcelona before almost anything else. One example could be the establishment in Barcelona in 1847 of the Junta de Fábricas, a lobby of the already powerful Catalan industrial bourgeoisie, which would eventually become the Foment del Treball, the foremost body representing Catalan employers even today. Gas had already lit its first lamps five years earlier (Table 12).

Finally, growth arrived after the laying of the pipelines was completed and the gasworks was in good working order, as more and more citizens progressively adopted the new light, gas lighting. By the five-year period 1844-1849, the number of private lights had increased tenfold, while public lighting had also increased, but by only 37 per cent. The fact that Lebon had broken with his partners in Valencia in 1846 and abandoned that project surely had either a small or large impact on these results as well. Barcelona was a large city and still offered a lot of room to grow in gas lighting, mainly for private individuals, and with time this would become the primary income of the Sociedad Catalana.

Gil and Lebon in Madrid, Valencia and Cadiz

In the first years of the new Sociedad Catalana para el Alumbrado por Gas (1843-1846) significant actions were made in other cities to implement gas lighting, promoted in the beginning by the same people who had done so in Barcelona, although not always in the same combination of individuals.

Lebon and Gil in Madrid (1843)

In Madrid⁸¹, as we have seen, the gas lighting concession had been awarded to José Viejo Medrano on October 16, 1833, who was given an exclusive 25-year right and was granted a six-year term to complete the work; however, after signing the contract, José Viejo disappeared for five years, blocking the City Council's action with his exclusive right. He did not reappear until December 18, 1838, when, after giving the necessary explanations, he signed a new contract, through which the six-year term to carry out the work was renewed until 1844, and then he immediately disappeared again from the city.

81. Simón Palmer (1989), pp. 38-50.

Around 1842 Charles Lebon showed up in Madrid, after having already won the Barcelona contract the previous year, to propose a solution to the City Council to the problem of gas lighting. But the session decided not to challenge José Viejo's exclusive right. It was not until December 20, 1842 that Viejo Medrano reappeared, and this time he ceded the concession to Pablo Coll, who wanted to develop what he called the *Compañía de Alumbrado Público de Madrid por Gas*.

But Pablo Coll only kept the concession for a few months, since on March 6, 1843, he passed it on to Pedro Gil Serra, who represented his father Pedro Gil Babot, Jaime Ceriola⁸², and Charles Lebon. This occurred only forty days after the constitution of the *Sociedad Catalana* in Barcelona.⁸³

In the Madrid of that time, whose City Council had granted the concession ten years earlier, although no one had done anything to develop the project over such a long period, the appearance of the businessmen and technicians who had started up the lighting system in Barcelona, which had been inaugurated the previous year, was probably interpreted as meaning that the matter would finally advance.

One problem that had to be overcome was the fact that the *business owner* was not Spanish. Carmen Simón Palmer points out: "The memory of the violent arguments that years ago had pitted free traders and protectionists against each other led Pedro Gil to make a series of offers that would not be very explainable without the existence of a current opposed to whatever came from abroad. For the first time, a foreigner was acting as an entrepreneur and there were plans to bring in French engineers; for this reason they stated they would not carry out their work in secret and that they would be willing to instruct, free of charge, the City Council's technicians. They also guaranteed that Spanish devices would be given preference provided their cost did not exceed 10 or 15% of imported ones".⁸⁴

However, the vision lasted only about two years, since on December 12, 1845, Pedro Gil returned to Lebon the 63,185 *reales de vellón* he had given of the 200,000 he had committed to. He later informed the City Council that he had

82. Jaime Ceriola was a banker of Catalan origin based in Madrid, who did business with the group of José de Salamanca and the Duke of Riansares, themorganatic husband of María Cristina of Bourbon-Two Sicilies, mother of Isabella II. He was also the father-in-law of Nazario Carraquiri, one of the most significant members of the group.

83. The corresponding Article of Association was subscribed on June 26, 1843.

84. Simón Palmer (1989), p. 46.

reached an agreement to assign the contract, on behalf of his father and Jaime Ceriola, to Edward O. Manby and William Partington, representatives of a company of English, French and Spanish capitalists, which was finally signed on February 20, 1846.

The new owner would be the Sociedad Madrileña para el Alumbrado de Gas in Madrid, created with a capital of 12 million *reales de vellón*, twice that of the Sociedad Catalana, and with a Provisional Advisory Board of the company composed of: José de Salamanca, Pedro Surra Rull, Mariano Carsi, José Buschenthal and Nazario Carraquiri, who was the president.⁸⁵

Lebon and José Campo in Valencia (1843)

In the case of Valencia, Lebon acted alone. He tried to repeat the Barcelona model, but with other shareholders, and also had the French engineers who were theoretically working on the Barcelona operation displaced, a fact that caused tensions with the Board of the Sociedad Catalana, which was displeased with the constant trips of its business owner to Valencia. Lebon, who had a strong character and prone to a certain violence, reacted with bad manners to the criticisms, leading to a situation of personal confrontation that would last for years.

In this case, matters moved swiftly: by March 18, 1843, Charles Lebon and J. Lecocq had won the gas lighting contract with the City Council of Valencia. Just two months after the incorporation of the Barcelona company, Lebon was with Pedro Gil in Madrid and with other partners in Valencia. The work in Valencia began quickly and gas lighting was inaugurated on October 9, 1844. Clearly, the complaints of the Sociedad Catalana were more than justified.⁸⁶

The Sociedad Valenciana para el Alumbrado de Valencia was established on October 30, 1844 with a capital of 1,200,000 *reales de vellón*. José Campo was the company's banker⁸⁷ (Table 13).

All the participants were known: Lebon and Lecocq, were the ones who had obtained the concession; José Campo, the foremost local financier; Hipólito Flury, the French consul in Valencia; Antonio Tintó, shareholder in the constitution and

85. In short, one of the best possible representations of what Ángel Bahamonde once designated as *Madrid's speculative bourgeoisie*. Bahamonde and Toro (1978), pp. 27-38.

86. García de la Fuente (1984), pp. 78-88.

87. José Campo, was the mayor of Valencia, and the city's foremost financier with interests in commerce, the shipping industry, all public services and also in credit companies and savings banks; he received the title of Marquis of Campo.

Table 13. Sociedad Valenciana para el Alumbrado de Valencia. Initial shareholders (1844)

Shareholder	Participation (<i>reales de vellón</i>)
Charles Lebon	200,000
Julio Lecocq	200,000
José Campo	200,000
Hipólito Flury	100,000
Antonio Tintó	100,000
Carlos Karsniki	100,000
Léger Marchessaux	100,000
Emilio Lebon	100,000
Napoleón Lebon	100,000
TOTAL	1,200,000

Source: García de la Fuente (1984), pp. 84-85.

secretary of the Board of Directors of the Sociedad Catalana; Carlos Karsniki, the Polish engineer who participated in the constitution of the Sociedad Catalana and who was appointed by Lebon as the technical manager of Barcelona, who in a very short time moved to Valencia to perform the same function; Léger Marchessaux, the French engineer who replaced Karsniki in Barcelona, but who also happened to be in Valencia; and finally, Emilio and Napoleon Lebon, relatives of Charles Lebon.

An important fact for this history was the constitution in Madrid on June 20, 1846 of the Empresa General Peninsular para el Alumbrado por Gas, created in the euphoria of 1846-1847 that was sparked by the creation of countless companies on the Madrid stock exchange, few of which lasted more than 18 months before vanishing in the spiral of the speculative crisis. La Peninsular had size and presence, was created with a capital of 50 million *reales de vellón*, and its founding partners were: William Partington and Edward O. Manby, two English experts in the gas industry, along with José de Salamanca, Mariano Carsi, José Buschental and Nazario Carraquiri, a structure very close to that of the Madrid company, but the objective was precisely to do business elsewhere on the peninsula, outside the capital.⁸⁸

88. Fàbregas (2003), pp. 15-16.

The activity in Valencia soon met with problems related to the development of the work and the relationship between Charles Lebon and José Campo, due to which it was finally sold to La Peninsular. The operation was carried out on November 27, 1846, thus ending Lebon's first experience in Valencia. Later, after the death of José Campo at the end of the 19th century, he would return to the city.

Catalana and Lebon in Cadiz (1845)

As for Cadiz, activity began about two years later, in 1845. The City Council, after studies and considerations, announced a competition to award the contract for the city's gas lighting, which was held on April 30, 1845 and to which six bidders, mainly French and English⁸⁹, presented themselves. Curiously, one of the bidders was Charles Lebon representing the Sociedad Catalana. François Reynaud was also present, who had been Lebon's rival at the auction in Barcelona in 1841, although as has been explained they had joined forces. Also present was the British group of John Burnett Stears, active in the sector since 1837 and with a significant number of gasworks in France and Italy.⁹⁰ However, the winner of the competition was the Briton Diego Federico Gregory, who later became involved in the Seville gas business.

The exact movements are not known, but it is recorded that in 1846, a few months later, the owners of the Cadiz concession were Lebon, Grafton and Goldsmidt. In short, at some point the English winner of the contract transferred it, or perhaps he had entered the competition as a Lebon front man. Obviously the Sociedad Catalana had disappeared; Lebon represented mostly his own interests and not those of his partners in Barcelona. The new arrangement did not last long: in the same year of 1846 the concession was transferred again, this time to Water-ton & Cie, and was finally transferred in 1847 to the Empresa General Peninsular de Alumbrado por Gas.⁹¹

The End of a Period

Following a few years of frenetic activity by Charles Lebon in Spain (1841-1846), the results of his efforts were not very satisfactory. In Barcelona he was in conflict with the Gil family; and in terms of Madrid, Valencia and Cadiz, he had had to exit

89. Fernández-Paradas (2015), pp. 37-39.

90. Fábregas (2003), pp. 104-105.

91. Fernández-Paradas (2015), pp. 49-50.

for different reasons. During this period, Lebon had focused on Spain, and had not developed any activity in France other than the maintenance of his Dieppe gasworks. The only exception was winning the concession for public lighting in the city of Algiers in 1844⁹², although it operated with oil, and it would take several years before it could be converted to gas.

At that time, Lebon temporarily paused his busy schedule of new projects. Some elements can be indicated that undoubtedly had an impact on this change of direction⁹³:

- The economic and social crisis that had been unfolding in France since 1845, the antecedent of the 1848 revolutions: a fall in agricultural production, the closure of factories, an increase in the number of people without work, poverty and hunger.
- Political crisis concerning King Louis Philippe in France, which would end with his abdication and the proclamation of the Second Republic in 1848. We must remember the active participation of Charles Lebon in the proclamation of the monarch in 1830.
- The model applied by Lebon in Spain, in which he provided the concessions and management, and hoped that local investors would contribute the necessary money, had evolved into endless arguments about his management, compliance with deadlines, the quality of the facilities, etc. Perhaps it was necessary to stop and reflect in order to design a new business model.
- The emergence of large companies, of unprecedented size and power, capable of obtaining financing on the stock market, such as La Madrileña and La Peninsular, with a great capacity for political influence of their promoting group, in the circle of José de Salamanca, and with English technical teams trained to carry out their mission.
- The beginning of the financial crisis in Spain, with serious consequences for the financial and business markets, caused by a period of fervent speculation.

For a few years, Lebon's only activity in Spain was managing operations in Barcelona.

92. In administrative terms, Algeria was never considered a colony; it was a *department* of France like any other.

93. Fàbregas (1989a), pp. 5-6.

The Stock Exchange and the Spanish Companies Act

The Bolsa de Madrid (Madrid stock exchange) was officially created in 1831 and initially listed only public debt securities. Barcelona did not have an official stock exchange until 1915, fully in the 20th century. Nonetheless, during this period of industrialization, the center of the country's industrial and financial activity was in Barcelona; need led to the creation of the instrument that was lacking and an unofficial stock market was gradually established, with different denominations, eventually known as the Mercado Libre de Valores de Barcelona, which consolidated its presence when it published its listings, a fundamental characteristic of an organized market.

The Board of Governors of the Colegio de Corredores Reales de Cambios de Barcelona (College of Royal Change Brokers of Barcelona) published the *Registro de Cotizaciones de Precios y Cambios* (Register of Price and Exchange Rates), where equity securities appeared for the first time on February 17, 1846. Only eight companies were then present: Banco de Barcelona, Camino de Hierro de San Juan de las Abadesas, Compañía Catalana General de Seguros Marítimos, General de Crédito en España, Barcelonesa de Seguros Marítimos, Navegación e Industria, Sociedad Minera El Veterano and Alumbrado por el Gas de Barcelona. The last obviously corresponding to the Sociedad Catalana para el Alumbrado por Gas.

The public appearance of the first stock quotations took place on December 21, 1851 in the *Diario de Barcelona*; apart from the above-mentioned public debt securities, the shares of four companies were listed: Sociedad Catalana para el Alumbrado por Gas, Banco de Barcelona, La Maquinista Terrestre y Marítima and La España Industrial.

Thus, the Sociedad Catalana was one of the first eight companies to be listed on the Bolsa de Barclona (Barcelona stock exchange) when it began its activity in 1846 and is the only one to continue its business activity today; it is still dedicated to gas as well as to electricity, although not specifically to gas lighting for many, many years (Table 14).

In the following years, many small local companies dedicated to gas lighting in Catalonia appeared, but they did not have the size to be listed on the markets. Companies with a certain relevance and continuity such as La Propagadora del Gas or La Energía were listed, as well as some short-lived, opportunist companies,

Table 14. Mercado Libre de Valores de Barcelona (Barcelona Stock Exchange). Listed gas companies (1846-1913)

Company	Start of listing	Last listing	Situation 1913
Sociedad Catalana para el Alumbrado por Gas	1846	1912	—
Catalana de Gas y Electricidad, S.A.	1912	—	Listed
La Propagadora del Gas, S.A.	1854	1859	—
La Propagadora del Gas, S.A.	1876	1912	—
Alumbrado de Spain y Portugal	1882	1885	—
Gas Rico	1882	1882	—
Gas Aerógeno	1901	1901	—
General de Alumbrado por Acetileno	1901	1903	—
General de Alumbrado por Acetileno	1908	—	Listed
Alumbrado de Poblaciones	1903	1911	—
La Energía, alumbrado y calefacción de Sabadell	1907	—	Listed

Source: Hortalà (2004), p. 69 and by the author.

such as the Sociedad del Alumbrado de España y Portugal, as well as Gas Rico and Gas Aerógeno.⁹⁴

The Spanish Companies Act appeared in 1848 as a reaction to the severe financial crisis that had occurred in previous years, when speculators, the *agiotistas* in the jargon of the time, had discovered that, if a stock company was incorporated for any of the most varied social purposes, it was possible to create certificates called shares that could be sold on the market, promoting incredible returns in the company that was to be started. As long as investor confidence persisted the cycle could be continued, but when, after a time, the first companies created in this way, instead of generating some profit, showed only significant and continuous losses, market confidence vanished and all the other companies built on the same basis collapsed, and terror gripped the market. This is what happened in Madrid in 1846-1847.

Among the companies with problems was the Sociedad Madrileña para el Alumbrado de Gas in Madrid, which held a shareholders' meeting on April 11, 1848 where it was reported that the Marquis of Salamanca had fled Spain and that the company was practically bankrupt; the English managers had to be replaced by

94. Hortalà (2004), pp. 69-72.

Spanish experts: Melitón Martín de Bartolomé, and later Gregorio López Mollinedo, who managed to maintain the situation until the definitive acquisition years later in 1856 by the Spanish affiliate of the French *Crédit Mobilier*.⁹⁵

The *Empresa General Peninsular para el Alumbrado de Gas* also had problems. It had begun to decline in 1847, with the Valencia City Council's demand that it strictly comply with the terms of the contract, and subsequently suffered the preventive seizure of the Valencia gasworks by the shareholders of the former *Sociedad Valenciana* upon their failure to collect the agreed terms of its sale. Finally, *La Peninsular* entered into a process of liquidation, which ended in bankruptcy in 1855. The company sold the gasworks in Cadiz in 1852, the gasworks in Valencia in 1855, and then vanished.⁹⁶

On January 28, 1848, the Spanish Companies Act was published, the first law on joint stock companies in Spain, which considered this type of company to be clearly dangerous. The new legislation was a consequence of the excesses carried out mainly in the Madrid market in previous years, when stock companies were created by the hundreds, with a minimum capital paid up by their promoters, and with the most unprecedented corporate aims, appealing to public savings in a highly speculative climate. In a very short time, within a few months, a total debacle began to occur, with a very important number of accelerated liquidations and bankruptcies, as sold dreams began to clash with business realities. This is the period that some historians have called the time of the *speculative Madrid bourgeoisie*, the period of the Marquis of Salamanca.

As a consequence, and it should be remembered that the Moderate Decade had by now begun, a clearly restrictive Companies Act was passed in 1848, which required that each company that wished to be incorporated had to be approved by the Queen, by means of a Royal Decree published in the *Gaceta de Madrid*. In addition, the same procedure had to be carried out for existing companies if they wished to continue their activity. It also regulated that for better public visibility and control, all stock companies should necessarily be listed on stock exchanges (Table 15).

The government's solution to confer greater seriousness to the market was sufficient for limiting the actions of the *agiotistas*, but, as the figures indicate, it did not do much for the country's industrial development. The control of the new Act

95. Fábregas (2012d), pp. 46-47.

96. Fábregas (2003), pp. 15-18.

Table 15. Industrial companies by shares existing in Spain (1859-1866)

Head office	Number of companies		Nominal capital (millions of pesetas)	
	1859	1866	1859	1866
Barcelona	25	15	59.5	41.0
Madrid	11	8	35.0	13.8
Rest of Spain	11	16	5.3	11.7
TOTAL	47	39	99.8	66.5

Source: Tortella (1973), pp. 377-380 and by the author.

contributed little to the needed commercial and industrial dynamism; its only advantage was to make known, from its promulgation, the precise number of public limited companies existing in Spain at that time.

A country with some forty joint-stock companies from 1859 to 1866 meant that it was not particularly dynamic compared to more industrially advanced countries in the European context. It should be noted, however, that around 60% of the share capital of the existing stock companies in Spain was domiciled in Barcelona, the real industrial center of the nation at the time. In the country as a whole in 1859, one out of every five existing companies was a gas manufacturer, eight out of a total of forty-seven companies, two of which were in Barcelona.

The Sociedad Catalana para el Alumbrado por Gas, without the problems facing other companies, adapted to the new Act, and was authorized by a Royal Decree of June 22, 1849, allowing it to continue its operations.⁹⁷ It is worth noting the incredibly important position of the Sociedad Catalana in 1866, when, with 3 million pesetas of paid-in capital, it represented 5% of the total paid-in capital of all the public limited companies in the country.

The appearance of the gas companies among the stock companies in Spain, while the regulations of the Companies Act of 1848 were in force, totaled eight in number. These were the oldest, the most traditional, and the largest of the gas companies promoted in Spain at the time. All of them, except the companies of Oviedo and Palma de Mallorca, would eventually be acquired by the Sociedad Catalana under its different names up to its current one of Naturgy. Smaller

97. "Having heard the Royal Council, I have come to grant My Royal authorization to the company entitled 'Catalana del alumbrado de gas' so that it may continue in its operations according to its constitution." Royal Decree of June 22, 1849 (*Gaceta de Madrid*, June 29, 1849).

Table 16. Industrial companies in Spain. Gas companies (1859-1866)

Company	City	Date of Royal Authorization
Sociedad Catalana para el Alumbrado por Gas	Barcelona	22-06-1849
La Propagadora del Gas	Barcelona	03-05-1854
Gas Reusense	Reus	04-07-1856
Sociedad Tarraconense para el Alumbrado por Gas	Tarragona	22-03-1859
Sociedad del Alumbrado de Gas de Palma de Mallorca	Palma de Mallorca	13-04-1859
Sociedad Comanditaria González, Alegre, Polo y Cía.	Oviedo	21-09-1859
Madrileña del Alumbrado y Calefacción por Gas	Madrid	01-02-1865
Gas de Sevilla	Seville	20-05-1866

Source: Instituto Nacional de Estadística (1859-1866): *Anuarios*. Madrid: INE.

companies in the mid-19th century were usually limited partnerships and were not affected by the new regulations (Table 16).

In the industrial context of the country in 1859, the main industrial companies ranked by their nominal capital were the Compañía General de Minas de España, La España Industrial, La Fabril y Comercial de los Gremios de Madrid, La Maquinista Terrestre y Marítima and La Fabril Algodonera. In short, textiles, mines and guilds. In order to find gas companies in this classification, it was necessary to descend to the

Table 17. Ranking of industrial companies. Spain (1859)

Ranking	Company	Province	Nominal capital (millions of pesetas)
1	Compañía General de Minas de Spain	Madrid	15.00
2	La Spain Industrial	Barcelona	12.50
3	Fabril y Comercial de los Gremios	Madrid	7.50
4	La Maquinista Terrestre y Marítima	Barcelona	5.00
5	La Fabril Algodonera	Barcelona	3.50
—	—	—	—
19	Sociedad Catalana para el Alumbrado por Gas	Barcelona	1.50
24	La Propagadora del Gas	Barcelona	1.50

Source: Instituto Nacional de Estadística (1858): *Anuario*. Madrid: INE, pp. 365-369

19th position where the Sociedad Catalana para el Alumbrado por Gas appeared, and then to the 24th position with La Propagadora del Gas (Table 17).

New Management: José Gil

After the first years of the Sociedad Catalana para el Alumbrado por Gas, once the gasworks had begun operating and the initial pipelines had been installed, as indicated above, a long process of arguments began between the two principal promoters of the company: Lebon and the Gil family. The differences began as a result of the almost immediate disappearance of Lebon to promote his gasworks in Valencia, which meant he did not devote adequate time to the gasworks in Barcelona in its initial moments, causing great concern in the Gil family.

Over time, the conflict, instead of diminishing, grew sharper due to additional elements, such as the poor quality of the materials used to build the gasworks' retorts, which forced them to be renovated a few years after their initial construction with the consequent expense. The situation was definitively complicated when the entrepreneur was unable to deliver on his promises in terms of economic performance and the company's interests. Another element to consider was that the Gil family, as time went by and through their involvement in the company, had become familiar with the business and the development of its activity.

Charles Lebon, meanwhile, had seen how his efforts to develop new businesses in Spain had not progressed for various reasons, as has been described in the cases of Madrid, Valencia and Cadiz. And he had gone back to France to try to resolve his problems there, and also to create new frameworks that would allow him to move forward. His big problem was the organization, management and financing of his businesses, which were not on the same level as his entrepreneurial capacities.

Finally, on March 23, 1847, Charles Lebon created what would be his great instrument: the Compagnie Centrale d'Éclairage par le Gaz, Lebon et Cie. as a limited partnership, with a capital of 1,200,000 francs⁹⁸, with himself as manager

98. Lebon et Cie. (1947), p. 43. The limited partnership by shares brought together two types of partners: general partners or managers, who managed the partnership and were jointly and severally liable and unlimited for their actions, and limited partners who invested capital and were liable only up to the limit of this contribution.

and several limited partners, such as Bayle and Marchessaux.⁹⁹ Over time, any concessions obtained would be contributed to this company, which would manage the existing operations and would be listed on the Paris stock exchange, ensuring a financing path.

On the other hand, after having overcome investment difficulties and with the growth of its market, the Sociedad Catalana began to be aware of its potential. In the Report presented to the Shareholders' Meeting of January 15, 1848, it was stated: "Gentlemen, after the many difficulties overcome during the first years of the company's existence, the beginning of a less embarrassing situation has been achieved which will soon be encouraging in every respect. Companies containing the elements of prosperity and good inner harmony must pass through such formalities".¹⁰⁰

The first years of the relationship and the difficulties of the company with the entrepreneur and the expectations generated led to examining the possibility of changing the management system to find a more appropriate form of relationship, including the possibility of changing the business owner. After appropriate discussions between the shareholders at the January 1848 meeting, it was agreed "to accept the principle of changing the current management system, either by means of leasing the gasworks or by mixed management".¹⁰¹

The Board of Directors, presided over by Félix Ribas, dealt with the situation and in a session held on February 7, 1848, considered that an auction should be held of the possible proposals to be considered, that of leasing or any other proposal those interested might wish to present. An interesting detail: the Consul of France in Barcelona, Ferdinand de Lesseps, attended this session of the Board as a guest; Lesseps, as we know, was in contact with Charles Lebon.¹⁰²

Upon the creation of the Compagnie Centrale, Lebon's situation in Barcelona, with his permanent arguments with the Gil family and the shareholders of the Sociedad Catalana, reached a point of no return in 1848, when he made the proposal to lease the Barcelona gasworks to the shareholders in exchange for the payment

99. Marchessaux was described in the history of the Lebon company in the constitution of the company as a friend of Charles Lebon, and was at that time the technical manager of the factory in Barcelona. We have seen him act in Valencia. In addition, in 1846 he obtained the concession for the gas lighting of Honfleur in France, a concession that was contributed to the new company in 1847. Lebon et Cie. (1947), p. 155.

100. NFHA.SCAG. *Asamblea General* (15-01-1848).

101. Sociedad Catalana para el Alumbrado por Gas (1849), p. 5.

102. NFHA.SCAG. *Junta Directiva* (07-02-1848).

of a fee, which was his current strategy to contribute gasworks and concessions to his recently incorporated company.

Two formal proposals were received by the deadline:

- One signed by Ildefons Cerdà and Léger Marchessaux from Valencia, presented on July 14, 1848, which formally proposed the lease of the gasworks. Marchessaux¹⁰³ was an employee of Lebon. Ildefons Cerdà, later the great urban planner of Barcelona, at that time had finished his career at the Escuela de Ingenieros de Caminos y Puertos de Madrid (1841), and was beginning his professional activity, without having yet begun his also important political career within the progressive party.
- And another from the former director of the company, José Gil Serra, presented on January 31, 1849, which proposed a mixed administration system, which in modern terms would be called a management contract.

In short, one proposed developing the activity, appropriating the profits and paying a fee in return, while the other proposed that the profits should go to the shareholders and he should be remunerated for his management.

It was a hard-hitting, high level clash; obviously behind Ildefons Cerdà was Lebon while, on the other hand, behind José Gil was the Gil family with all its economic might. If the confrontation between the company and Lebon had been serious, the confrontation between the true founders of the company, Gil and Lebon, had been even worse over the years. At that time, José Gil was a member of the Board of Directors of the company and resigned to present his offer.

103. Léger Marchessaux was the French engineer in Lebon's team responsible for the Barcelona facilities of the Sociedad Catalana. He had also accompanied Lebon in his activity in the Valencia gas industry and in the constitution of the Compagnie Centrale. The withdrawal of Lebon from Valencia in 1846 coincided with the promotion in the city of the Sociedad de Conducción de Aguas Potables, to resolve the supply of water to Valencia. The technical projects were entrusted to Ildefons Cerdà, a road engineer who would later develop the Eixample of Barcelona, and to Léger Marchessaux. The work culminated in the capture of the Turia River in Manises, and the transport and distribution to the city, and the construction of an important reservoir for 9,000 cubic meters of water, all of which was inaugurated in 1850. The Museo de Historia de Valencia is currently located in the warehouse. It is in this context of this relationship that Cerdà and Marchessaux jointly presented a management proposal to the Sociedad Catalana representing the interests of Charles Lebon.

When Lebon failed in his attempts to continue running the Sociedad Catalana, Marchessaux was replaced as technical manager by the Englishman William Richards in 1848.

Marchessaux was also responsible, in 1852, for starting up the gas lighting operation in Nice, a territory that still belonged to the Kingdom of Sardinia. Finally, as a technician he designed one of the first hydraulic gas meters in 1852. Arroyo (2000), p. 56; Lebon et Cie. (1947), pp. 43 and 222; Moyano and Thomas (2016), pp. 127-131.

Finally, the General Meeting of Shareholders of the Sociedad Catalana of March 15, 1849 decided, after analyzing the proposals¹⁰⁴, to accept José Gil Serra's offer by a non-debatable 87% of the votes (455 votes in favor of 525 present). The shareholders valued more the seriousness of José Gil, of the Board of Directors, the assured returns and the guarantees granted by his father, with property and income, for the adequate fulfillment of his obligations. The mixed administration contract was signed on May of 27, 1849, and began its journey on July 1, 1849, with an initial duration of ten years.¹⁰⁵ In short, this meant that Lebon, who had already broken away from his partners in Valencia and Cadiz in 1846 and had disappeared from the respective cities, was removed as a gas business owner from Barcelona in 1849. Lebon's first Spanish experience ended with success as an entrepreneur and failure as a businessman. He would return to his bases in France, although coinciding with the difficult moments of the French Revolution of 1848 and the establishment of the Second Republic.

Later, in 1862, both Charles Lebon and Ildefons Cerdà would return to Barcelona, to compete with the Sociedad Catalana, and this would eventually provide the city with a service structure consisting of several gasworks competing against each other, a situation found only rarely elsewhere in the country.

The company, after its first six years of existence, had managed, with some problems, to complete its installations and was now operating; it had a contract with the City Council for public lighting and a certain penetration in private lighting. The promoter Charles Lebon had disappeared and the Gil family, bankers of the company since its inception, had taken over the responsibility of management. The expected economic results had not been achieved, so it was necessary to rationalize spending, provide technical expertise and attract potential customers to grow the business. José Gil Serra's management would focus on all these fronts.

The company adapted its organization to operate with a mixed system of a Board of Directors, presided over by Félix Ribas, and a chairman, José Gil Serra. In order to ensure control, the administrator Pedro Farrán became the comptroller, and his mission was to supervise the actions of the chairman.

104. Sociedad Catalana para el Alumbrado por Gas (1849), pp. 1-9.

105. NFHA.SCAG. *Concesión de Administración mixta y convenio hecho y firmado entre la Junta Directiva y administrativa de la Sociedad de la Iluminación por Gas en esta Capital; y D. José Gil Serra del comercio de la misma (27-05-1849)*.

Table 18. Sociedad Catalana para el Alumbrado por Gas. Contracted lights (1849-1856)

Type of lighting	Number of lights 01.07.1849	Number of lights 01.07.1856	Increase
Street lighting	698	1,847	1,149
Private lighting	7,027	20,562	13,535
TOTAL LIGHTS	7,725	22,409	14,684

Source: NFHA.SCAG. *Memoria leída en la Asamblea General de Accionistas* (1850 and 1857).

At the time, the company was managed by seven people: Pedro Farrán, comptroller; Ignacio Alabán, cashier; José Mansana, clerk; Luis Murat, José Sala and José Navarro, inspectors, and Ramon Amigó, bill collector.

In order to ensure the technical quality of the installations, the British engineer William Richards¹⁰⁶ was appointed as the new engineer of the company, an expert of great technical ability, as his work, his patents, his entrepreneurial capacity and his bibliographical contributions demonstrated. Evidently, the English engineer found fault with all the French technology implemented in the gasworks, from the retorts to the pipes.

The years of the first mixed management contract with José Gil were years of intense activity, market growth and profits. Within seven years, Gil contracted twice as many lights as Lebon had in his six years of management¹⁰⁷, both in public and private lighting, and with good economic returns (Table 18).

106. William Richards (1816-1893) was a British engineer who had acquired his experience at the Gas Light and Coke Company in London, the company he worked for, and later moved to Spain. In May 1848, the Gil family hired him as technical manager of the Sociedad Catalana to replace Lebon's French experts. He obtained several patents for gas meters and other devices in both the UK and Spain. He also built gasworks in Catalonia, both on behalf of José Gil and on his own initiative, in Sabadell, Vilanova, Reus, Tarragona and Manresa between 1851 and 1858. In 1861 or 1862 he returned to England, and was probably replaced by Claudio Gil, the family's engineer. In his later years he devoted himself to gas meter issues again, but ended his days in financial difficulties. In 1893, he wrote to the Sociedad Catalana, to express his precarious situation and to request help; unfortunately, the day the request was dealt with by the Board of Directors was the same day as his death. Moyano and Thomas (2016), pp. 125, 131, 139-141; AFGNF. SCAG. *Junta Directiva* (12-05-1893).

107. The pricing policy for the sale of gas to private customers included the possibility of paying on an hourly basis according to the lighters installed and the hours of operation, or by meter according to the consumption actually made. In the first case, for example, a 12-hole circular lighter with service until 11 p.m. was priced at 34 *reales de vellón* per month, and up to 40 if the service was required until 12 p.m.. In the case of sales by meter, the price was set at 75 *maravedies* per cubic meter, i.e. 2.20 *reales de vellón* per cubic meter. The prices correspond to 1854. Pi i Arimon (1854), p. 296.

The monetary equivalents are as follows: 1 peso fuerte = 5 pesetas, also known as duro; 1 peseta = 4 reales de vellón; 1 real de vellón = 34 maravedies; 1 euro = 166.386 pesetas

The synergies and rationalization of spending typical of modern business practice was always present at that time. José Gil Serra said in 1849: “One of the main and most fruitful sources of profit is the system of economies applied with the greatest rigor to all objects without exception, including those which seem at first glance unable to produce even futile and insignificant returns”. An example of this philosophy was the auctioning of coal hauling from the port to the company’s gasworks; the result was that from three *reales* per car transported, the cost was reduced to two *reales*, a reduction of 33%, and this as early as the middle of the 19th century.

The actions carried out in the first year of the new mixed management system, 1849-1850, enabled the company to earn profits that made possible adequate remuneration for its shareholders and management. Revenues came from both public lighting (29%) and, more importantly, private lighting (56%) and also from the marketing of coke (14%), a significant by-product obtained from the distillation of coal to produce gas. In terms of expenses, the most important were the raw materials used (67%), basically coal, and also personnel expenses (23%), with a significant containment of general expenses (4%), and what we would nowadays

Table 19. Sociedad Catalana para el Alumbrado por Gas. Results of the 1849-1850 financial year

	<i>Pesos fuertes</i>	Percentages
PRODUCTS	79,950	100
Street lighting	23,175	29
Private lighting	44,887	56
Sale of coke	11,324	14
Sale of tar	564	1
MATERIALS and EXPENSES	46,376	100
Coal, lime, resin, clay and bricks	31,297	67
Personnel	10,863	23
General expenses	1,994	4
Impairment and replacement	2,222	5
MANUFACTURING PROFIT	33,574	
Balance of the profit and loss account	537	
RESULT	34,111	

Source: Pi i Arimon (1854), p. 294.

designate as depreciation and amortization (5%). The results represented a significant 43% of the turnover, approximately 11% of the share capital (Table 19).

In short, the actions implemented produced better technical quality, greater commercial growth, cost control and the achievement of synergies, which led, of course, to a clear improvement in economic results. The good results and the clear harmony between the Board of Directors and the managing director led to the extension of the mixed administration system initially until 1859, and later in different sections until 1864 when the loss of public lighting forced new approaches.

The gasworks' surroundings in the Barceloneta district had evolved over the years, but were still far from its industrial vocation in the future, although since 1848 it now had a railway station, the first in Spain, on the Barcelona-Mataró line. A description from 1854 states: "Within its limits, this quarter contains the bullring, the gasworks for the lighting of Barcelona, the baths of the Casa de la Caridad, and the glass furnace, an iron foundry, the railway station, an infantry barracks, another for cavalry, the parish church and the juniper gardens".¹⁰⁸

The Competition: Gràcia and Sant Andreu

The first signs of competition appeared in the town of Gràcia, next to Barcelona, and which had been a part of the bigger city, until 1850, when it became independent and created an autonomous municipality, a situation that would continue until the new reunification of 1897, when practically all the small municipalities in Barcelona's vicinity were incorporated into the city. This circumstance was very significant for the history of gas, because it meant Gràcia could be considered a distinct municipality from Barcelona and could therefore have its own gas lighting contract and concession after 1850.

Only two years passed until Ramón Salvadó Serra signed an agreement in 1852 with the City Council of Gràcia to develop the gas lighting service for 25 years for the new municipality.¹⁰⁹

The gasworks was located on the edge of the municipality, in the area delimited by the current streets of Torrent de l'Olla and Abdó Terradas, in a large area of

108. Pi i Arimon (1854), p. 203.

109. Arroyo (1992), p. 2; Sudrià y Aubanell (2017), pp. 45-49.

the Calle Córcega and its surroundings, Calle Venus and Calle Bruc. In the course of its history, the gasworks had up to three gasometers.

The process was similar to what had occurred in Barcelona; first the construction of the gasworks and the start up of the service and then the promotion of a company to manage it. In 1853, after the corresponding period of construction and installations, Ramón Salvadó managed to inaugurate the gas street lighting in the town of Gràcia.

The constitution of the company, to transfer the assets and the concession to it, was carried out in two stages during the same year of 1853:

- On April 2, a limited partnership was set up with a capital of 200,000 pesetas to light the town of Gràcia by means of gas.¹¹⁰
- Only two months later, on June 4, the definitive public limited company, La Propagadora del Gas, was incorporated with the same capital as the Sociedad Catalana, 1,500,000 pesetas, represented by 3,000 shares of 2,000 *reales de vellón* (500 pesetas). The new company initially set up its headquarters on Rambla de San José, 27, in Barcelona, and was given a 25-year term.¹¹¹

The ten initial shareholders of La Propagadora subscribed a capital of approximately 50 % of the nominal capital, with Ramón Salvadó as the main shareholder, controlling more than 20 % of the issued capital (Table 20).

The new company immediately appointed its promoter, Ramón Salvadó Serra, as its managing director and began trading on the stock exchange, a circumstance that was compulsory for all companies with shares under the 1848 Act. The development of its business began with a drive: to equip Gràcia with gas lighting.

Barcelona at that time was still enclosed within its city walls, which would not be demolished until 1858, but concern about the city's growth was already palpable, leading in 1846 to a first plan by the City Council of what form the Eixample ("Expansion") of the city should take. The land between Barcelona and the town of Gràcia, what would later become the Paseo de Gràcia, was beginning to be transformed from fields and orchards into entertainment establishments outside the city walls for the people of Barcelona. The future was around the corner.

110. NFHA.LPG. *Escritura Constitución de Sociedad en comandita para alumbrar por medio del gas la villa de Gràcia* (02-04-1853).

111. NFHA.LPG. *Escritura Constitución La Propagadora del Gas* (04-06-1853).

Table 20. La Propagadora del Gas. Founding members (1853)

Shareholder	Capital (<i>duros</i>) 02.04.1853	Capital (<i>duros</i>) 04.06.1853	% 1853 final
Ramón Salvadó Serra	20,000	35,000	11.7
José Martorell Guitart	4,000	20,000	6.7
Jaime Baulenas Mateu	4,000	20,000	6.7
José Rodríguez Capará	—	20,000	6.7
José María Sirvent	—	15,000	5.0
Antonio Rovira Borrell	4,000	10,000	3.3
José Jover Sans	4,000	10,000	3.3
José Rovira Morera	—	10,000	3.3
Antonio Gatell Badía	—	10,000	3.3
Ignacio Valentí Colom	—	5,000	1.7
Francisco Font Romá	2,000	—	—
José Molas Vallvé	2,000	—	—
Total capital issued	40,000	155,000	51.7
Capital to be issued	—	145,000	48.3
TOTAL SHARES	40,000	300,000	100.0

Source: NFHA.LPG. *Escritura Constitución de Sociedad en comandita para alumbrar por medio del gas la villa de Gràcia 02-04-1853*, and *Escritura Constitución La Propagadora del Gas (04-06-1853)*.

Ramón Salvadó's vision of the future when he created the company was evident; he established the same amount of shareholder equity for La Propagadora as that of the Sociedad Catalana of Barcelona, even though Gràcia was a much smaller municipality. The company of Gràcia was prepared to provide the lighting for the entire Paseo de Gràcia, starting with the most emblematic establishment of the time: the Campos Elíseos.

The Campos Elíseos was a large complex with gardens, a café, a restaurant, a concert hall, a theater and even a bullring, located on the present Paseo de Gràcia where it meets Calle Mallorca. This complex represented a consumption of 800 lights. It should be remembered that the total number of private lights supplied by the Sociedad Catalana at the time was around 16,000, and that the total public lighting in Barcelona amounted to 698 lights in 1849. The size of the Campos Elíseos project was unprecedented.

Table 21. Agustín Rosa y Cía. Founding members (1857)

Shareholder	Capital (<i>duros</i>) 1856	Capital (<i>duros</i>) 1857	% 1857
Juan José Plandolit	3,000	4,200	16
José Angeles	3,000	4,200	16
Vicente Oñós	2,500	3,500	13
Agustín Rosa	2,000	3,200	12
José Guardiola	—	3,000	11
José Comalada	2,000	2,800	11
Jayme Martí	2,000	2,800	11
Gabriel Falqués	1,500	2,500	10
TOTAL SHARES	16,000	26,200	100

Source: NFHA.SAP. *Escritura Constitución Agustín Rosa y Cía.* (1856.09.03), and *Escritura Ampliación de capital e incorporación de nuevo socio de la sociedad Agustín Rosa y Cía.* (24-05-1857).

The competition to supply the complex was initiated by La Propagadora when it announced on April 2 that it wished to contract the lighting of the Campos Elíseos. The reaction of the Sociedad Catalana was not long in coming, and it immediately started negotiations, which culminated in only nine days, on April 11, with the signing of the supply contract by the latter.

Subsequently, a process of heated rivalry between the two companies began to secure lighting contracts and customers in the area of the city's future expansion, and even more so after the agreement reached in 1854 to demolish the city walls of Barcelona and its execution four years later. The struggle and competition to supply lighting in the area of Barcelona's expansion would continue for years.

A similar process to that of Gràcia, although of less importance, took place in another independent municipality on the plain of Barcelona: Sant Andreu del Palomar. There the promoter was Agustí Rosa Joval, who obtained a concession from the civil governor "for the planning of a gasometer in the town of San Andrés del Palomar for a 20-year term".

Here the order of the basic activities of the model changed; the order would not be, first, the contract with the City Council, then the construction of the gas-works, installation of the pipelines, inauguration of the lighting and finally the constitution of the company. In Sant Andreu, the company was first incorporated with the permission of the civil governor, but without a contract with the City

Council or any installation. However, as in Gràcia, the company was constituted in two successive stages:

- On September 3, 1856, the limited partnership was constituted: Agustín Rosa y Compañía, with a capital of 80,000 pesetas, and seven partners, for “the establishment of a gasometer and the consequent production of gas in the nearby town of San Andrés del Palomar”.¹¹²
- On May of 24, 1857, the company increased its capital to 131,000 pesetas and incorporated José Guardiola as a new partner.¹¹³

Being a much smaller company than the one in Gràcia, its capital did not reach 10% of that of Gràcia, and it was constituted not as a joint-stock company but as a limited partnership, so that the promoter Agustín Rosa was not the main shareholder, but rather the partner who assumed the leadership and management of the company (Table 21).

After the appropriate negotiations with the City Council, a lighting contract was signed for the municipality in 1857, with a term of 20 years starting from the following year.

The gasworks was built in the southernmost part of the municipality between Calle de Sant Adrià and the railway, not far from the urban center of Sant Andreu; at some point it had two gasometers. In current terms, we could place it, approximately, at the crossroads of Calle de Sant Adrià and Calle Ferran Junoy.

Therefore, from 1857 onwards, three gasworks coexisted within what is nowadays the municipal area of Barcelona, each with a restricted scope of service and supply to an independent municipality, which were later incorporated into the city of Barcelona: that of the Barceloneta of the Sociedad Catalana, that of Gràcia of La Propagadora del Gas and that of Sant Andreu del Palomar of Agustín Rosa y Compañía.

112. NFHA.SAP. *Escritura Constitución Agustín Rosa y Cía.* (03-09-1856).

113. NFHA.SAP. *Escritura Ampliación de capital e incorporación de nuevo socio de la sociedad Agustín Rosa y Cía.* (24-05-1857); Arroyo (1998), p. 3.

1855-1890

The End of Public Gas
Lighting and Growth in
Spain

The Years of Resilience

The period from 1855 to 1864 was a very challenging one during which problems came from all directions, posing significant difficulties that would redirect the course of the company:

- Problems with the City Council, which saw the expiration date of the contract approaching and was in a clear position of confrontation with the company to take public lighting away, at least.
- The reappearance of Charles Lebon, but not as a promoter of gas companies as in his first experience in Spain, but as an important French businessman, with a special relationship with the City Council and with Ildefons Cerdà, the civil engineer who promoted the plan of the Eixample of Barcelona.
- The role played by consumers, grouped naturally or artificially, in opposing the gas lighting company. They complained about the prices charged, with the odd intention of their leaders to start their own gas company or companies.
- Finally, all the situations were strained and numerous judicial processes lengthened the time frames.
- And the end of the 20-year term for which the company had been established was drawing dangerously close. Decisions had to be made about whether to continue fighting and building for the future while on track to losing Barcelona's public lighting, or to simply end it all with a certain aftertaste of failure after so many years.
- It was a particularly difficult period on many fronts; it was the era of resilience, of fine-tuning the personality of the company and its leaders, forging new lines of action for many years to come.

In September of 1857, the public lighting contract for the city of Barcelona, which was held by the Sociedad Catalana para el Alumbrado por Gas, expired, as it had been awarded by the City Council for a period of 15 years since the effective inauguration of the lighting system in 1842.

Relations between the utility company and the City Council had varied greatly given the extreme volatility of the municipal institution, which over the course of those 15 years had seen up to eighteen different mayors, obviously with different personalities and ideologies, and with an average duration of only ten months in

office. In the same period, the gas company had two managing directors: Charles Lebon and José Gil.

Moreover, Barcelona had changed a great deal: the city walls had been torn down, people were thinking of expanding into the plain of Barcelona, ideas about the future Eixample were already circulating, and the city had a bank and a savings bank and even an engineering school. The Sociedad Catalana had also grown and developed in those 15 years. Its presence and economic capacity was quite different and it did not depend solely on the City Council's contract and public lighting, since the emphasis had been placed on increasing the number of private customers, so that a clearly more stable mix of risk had been created.

The relationship between the company and the City Council at the time was typical of that found in any city in Spain. The City Council constantly complained that the company did not provide the best service: one night a lantern had not worked, the laying of a pipeline had not been carried out according to schedule, the quality of the gas and lighting was poor, and prices were expensive. The utility company, meanwhile, regularly complained about the same things: delays in the municipal permits to install pipelines in the streets and mainly about problems related to collecting payment for the service. It was a typical situation; in all cities the dynamic was the same, with a greater or lesser proportion of reason or realism on either side of the negotiations.

The years of experience and the efficiency of the management of the incumbent company had clearly sparked new interest in the situation. All these factors converged in 1855 when tensions began to be felt¹¹⁴, on the one hand, by the company's desire to sign a new contract or extend the previous one, and on the other, by various interests committed to the contrary. These were years of struggles and confrontations, which the Sociedad Catalana did its best to face, presided over by Félix Ribas and managed by José Gil.

The situation began to heat up in March of 1855, with disagreements between La Propagadora and the Sociedad Catalana over whether the former could install its pipelines through the territory of Barcelona or not. Almost immediately the City Council published a document of the bases¹¹⁵ for a new auction of public lighting

114. Sociedad Catalana para el Alumbrado por Gas (1860).

115. NFHA.SCAG. *Condiciones con arreglo a las cuales el Excmo. Ayuntamiento contratará el alumbrado público de esta ciudad por el gas y por el término de quince años con la empresa que ofrezca mayores ventajas con respecto al precio, como al mejor servicio público* (21-05-1855).

for 15 years, although there were still two years left in the current contract. The proposal included the advance of science clause¹¹⁶, with a maximum price for public lighting of 5.50 ms/hour (*maravedíes* per hour), the same as the previous 15 years. The concessionaire was also authorized to engage in private lighting, but warned that the City Council could allow new competitors to enter this area, and further recalling in Article 34 that: “the current company is authorized to keep the existing pipelines, maintaining the contracts for private lighting, the company being forbidden, however, to make repairs and replacements in its pipes after the termination of the current contract”.¹¹⁷

The rights of the Sociedad Catalana seemed to be respected in terms of private lighting, but if it could not extend its networks or repair existing ones, the company’s life would be ephemeral. Two years passed without the City Council making any additional moves, which meant that the end of the contract was approaching with no clear solution for the future.

In 1857, the City Council informed the company, as a first warning of the coming period, that it did not intend to extend the contract for the gas lighting service, but instead would auction it off again. The company obviously objected, but the mayor’s office indicated that the auction was not prejudicial; two bidders participated, one of whom was Charles Lebon. In the end, the City Council did not follow through and did not award the service, which meant that the Sociedad Catalana’s contract had to be temporarily extended while a new auction was arranged. As a precaution, the company commissioned a report that concluded that if the City Council forced it to extend the service because it could not find an immediate solution, this was equivalent to renewing the contract for 15 years.¹¹⁸ A ruling was also obtained from the Consejo Provincial de Barcelona (19-11-1857) which stated that yes, maintenance of the Sociedad Catalana’s pipelines could be carried out “during the period of the natural life of the pipelines”.

Other moves were made, however, motivated by different interests. One of them was by Charles Lebon, who had disappeared from Barcelona in 1849 when

116. The clause known as the “advance of science clause” required the concessionaire to adapt his actions to new inventions that might appear and that would provide a better or cheaper light.

117. The City Council’s contract with Charles Lebon of July 3, 1841 protected the company (art. 12), stating that if the contract was not continued after 15 years of its validity: “... the gasworks, ducts and their dependencies will remain the property of the Company and the private contracts will remain in force”.

118. The opinion of September 3, 1857 was signed by eminent legal advisors such as Juan Illas y Vidal, Laureano Figuerola, Francisco Permanyer and Manuel Duran i Bas.

his proposal to lease the gasworks failed, and who was well aware that in 1857 the city's lighting contract expired. Lebon began his actions in 1856, when he made a proposal to the queen to build a new gasworks, destined to compete with the Sociedad Catalana, in the area of Fort Pienc, with plans curiously signed by Ildefons Cerdà, and which finally did not prosper.¹¹⁹

An additional front of disagreement appeared in relation to consumers. It should be remembered that we are talking about an organization of consumers in the mid-19th century, which is truly a strange occurrence. The situation began with a call for a meeting on December 6, 1856 in the Salón de Ciento of the City Council of Barcelona, which was organized by the City Council itself, aimed at the city's gas consumers.¹²⁰ As was to be expected at the meeting, the Comisión de Consumidores Particulares de Gas (Private Gas Consumers Commission) was set up, the aim of which was to confront the Sociedad Catalana in order to defend, in theory, their rights as consumers. It should be remembered that, at that time, when the City Council took this initiative, the termination of the city's gas lighting contract was ten months away.

The first action of the new Commission, presided over by Valentín Sindreu, was carried out in March of 1857 and consisted of filing a lawsuit against the Sociedad Catalana, by means of which it demanded lower gas prices. At this point, the end of the contract was only six months away. This movement generated a legal battle that would last seven years.

In conclusion, the lawsuit was filed in March of 1857 and on August 10 the Court of First Instance ruled against the Sociedad Catalana, and on September 5 the 15 years of its contract with the City Council expired.¹²¹

The company, represented by Manuel Duran Bas as its lawyer in this case, appealed and won in the Territorial Court in June of 1861.¹²² The Comisión de Consumidores, for its part, did not hesitate or conform and appealed in cassation to the Supreme Court. Finally, in 1863 the Supreme Court ruled in favor of the Sociedad Catalana. Although the gas company clearly won the lawsuit, it had suffered seven years of wear and tear on its public image: what perhaps someone was looking for had been achieved. The basis for the disagreement was the prices that

119. Arroyo (1997), pp. 4-5.

120. Duran i Bas (1861), pp. 16-20.

121. In 1859, the Commission for Consumers addressed a letter to the queen defending its position.

122. Duran i Bas (1861).

the Sociedad Catalana applied to customers with a metered contract, considered by the Comisión de Consumidores to be unreasonable according to the prices of the 1841 contract; however, that contract only regulated the prices of supply by the hour, and left as unregulated the prices of supply by meter, a system that the customers who used it had accepted voluntarily after the appropriate information. The disagreement had no basis in law.

The Comisión de Consumidores was made up of a large but not majority group of consumers, a situation which was constantly complained about internally within the organization and in the newspapers, and which kept them from taking part in the auction in 1862. They complained about prices, but what they were really interested in was for several gas companies to exist in Barcelona, if possible owned by consumers, to ensure supply in the best possible conditions.¹²³

For this reason, President Valentin Sindreu took action and sent a letter in which he defended its ideas upon reading contrary rumors in the newspapers, such as: “a plan is being studied to merge all of London’s small gas companies into one, as Paris did with its seven companies in 1856”.¹²⁴ Despite his convictions, Sindreu applied for a 50-year concession for gas street lighting in the city of Alcoy on May of 20, 1863, and requested that the City Council not allow the installation of other gasworks or pipelines. The concession was granted on June 12, 1863 and was withdrawn in 1865 because no specific work had been carried out.¹²⁵ The Comisión de Consumidores remained active until 1865.

After 1857, relations with the City Council again came to a stand still, perhaps due to the lawsuits of the Comisión de Consumidores, which carried out intense negotiations in Madrid through its president, who stayed for long periods in the capital. Discussions resumed in 1860 — after it became clear that the City Council could not expropriate without an assessment of the assets of the utility company as of July 31, 1860 — and discussions continued throughout 1861 with different proposals made by the company to the City Council. Among these proposals was to sign over the gasworks to the City Council for a price of 4.5 million pesetas on the day on which the company celebrated its 20th anniversary (January 28, 1863);

123. To manage his interests Valentin Sindreu spent long periods in Madrid trying to influence the authorities as a lobbyist. On one occasion his stay was 3 months, on another occasion 15 months. It is not known how these activities were funded at the specific level. *La Corona*, March 29, 1862.

124. *Gaceta de los Caminos de Hierro*, January 8, 1860.

125. García de la Fuente (2002), pp. 174-175.

Table 22. Sociedad Catalana para el Alumbrado por Gas. Contracted lights (1849-1862)

Type of lighting	Number of lights 01.07.1849	Number of lights 01.07.1856	Number of lights 01.07.1862
Public lighting	698	1,847	2,014
Private lighting	7,027	20,562	36,115
TOTAL LIGHTS	7,725	22,409	38,129
% private lighting	91.0 %	91.8 %	94.7 %

Source: NFHA. SCAG. *Memoria leída en la Asamblea General de Accionistas* (1850, 1857 and 1863).

at that time the share capital amounted to 2.3 million pesetas.¹²⁶ But no concrete results were achieved.

Finally, when in 1862 the City Council called for the auction of public lighting, the Sociedad Catalana, after studying the conditions, decided not to bid. The conditions were harsh and the company had already strongly developed private lighting, which was clearly more profitable. In legal discussions with the municipal government, it had also been granted the right to continue supplying its private customers, even if it was not the company holding the public lighting contract.

The debate over whether the utility company had the right to continue supplying gas for private lighting even if it lost the public lighting contract was very important, because apart from being able to continue with the activity to supply its customers, it meant that the City Council could not take over the gasworks at the end of the contract. This was so because it was not a gasworks associated exclusively with public service; the Sociedad Catalana could thus continue supplying its customers, and keep the gasworks to supply them in the future if the City Council assigned the public lighting to another company, as was the case. On the other hand, in 1862, private lighting represented 95 % of the lights contracted in Barcelona (Table 22).

On July 7, 1862, the auction was held and the service was awarded to the Briton William Leigh, who tried, but was unable, to get the Sociedad Catalana to sell him its assets, the gasworks and the pipelines. As time passed, Leigh did no specific

126. NFHA.SCAG. *Asamblea general* (29-11-1861). In the document of proposals to the City Council, page 5, note is made that: "it is necessary to bear in mind that the shares of this Company are not concentrated in the hands of a few and opulent capitalists, but on the contrary they are distributed among a large number of artisans, widows and other people who are completely foreign to the *agios* of the stock market and speculation, who have been mainly attracted by the security of receiving an annual interest of eight and a half percent, which they have had as a minimum of the company's profits and are guaranteed with a guarantee in real estate".

work and in 1863 the City Council considered the auction to have expired. Perhaps the municipal action was related to the Royal Order of March 23, 1863, which ruled that the *Sociedad Catalana para el Alumbrado por Gas* could continue to supply private customers, and that the municipality could therefore neither seize the gasworks nor force its sale for a fair price.

The City Council called for a new auction on December 30, 1863, to which two bidders presented themselves, and finally the new contract for the public gas lighting in Barcelona was awarded to the great enemy of the *Sociedad Catalana*: Charles Lebon.¹²⁷ This marked the beginning of a new era.

However, the City Council made a sophisticated move: it obtained authorization from the government to be able to manage a gasworks as a municipal operation and then entrusted Charles Lebon with its management and the pledge that the municipality at the end of the contract period could keep the gasworks. This led to the construction of the *El Arenal* gasworks¹²⁸, which began its activity under the name *Gas Municipal*, but was managed by Charles Lebon. The agreement between Lebon and the City Council was signed in 1864 and lasted until 1880, while the contract of the *Sociedad Catalana*, which should have ended in 1857, continued until 1864, and even two further years while Lebon built his new gasworks.

Ildefons Cerdà's intervention in all these dynamics is worthy of study. We are familiar with his historical relationship in favor of Lebon and against the *Sociedad Catalana*, managed by the Gil family. At that time, Cerdà was already fully dedicated to urban planning and politics, from within the Barcelona City Council. And it was precisely in 1863 that the City Council decided to hand over the contract for public lighting in Barcelona to Lebon, replacing the *Sociedad Catalana*.¹²⁹

Mercedes Arroyo clearly states: "Cerdà maintained an ambivalent position throughout the process of gas installation in Barcelona and constantly fluctuated between protectionism and free trade: the same person who, in January of 1848,

127. Falgueras (1969), pp. 52-53.

128. The gasworks was located in what is now the Port Olímpic of Barcelona, with a 1 kilometer-long façade along the beach.

129. Ildefons Cerdà had been a deputy in Madrid (1851-1852), and later councilor of the Barcelona City Council (1854-1856) and (1863-1866); his *Eixample Plan* had been approved in 1859; he was the project manager of the organization *Fomento del Ensanche de Barcelona* (1863-1865); in short, he was a person with great influence in the city. He had worked on gas issues with Lebon since Valencia (1848), on the *Fort Pienc* project, and was a City Councilor when the Frenchman was awarded the lighting contract (1863). And he was the author of the topographical plan of Lebon's *El Arenal* gasworks (1864).

supported Charles Lebon's intentions — whose plans would later be shown to be monopolistic —, in 1854 opposed protectionism and the monopoly of La Catalana in the drafting of the bases for a new contract, while in 1864 he supported Charles Lebon's intentions to absorb the city's entire gas consumption", and added: "He was not only a personal friend of Charles Lebon but also carried out several notable actions in the gas business".¹³⁰

A New, Competitive Company

The situation of confrontations and transition surrounding the public lighting contract in Barcelona in recent years clearly indicated that an era was about to end and that the Sociedad Catalana had to be prepared for the next stage of its long journey.

The company had to face a new situation, the business for which it was created was no longer in its hands; its disputes with the City Council had ended with the public lighting being awarded to Charles Lebon. In order to maintain its right to administer private lighting, it had had to oppose the City Council, although in the end the government had recognized the company's right. It had also had to resist the attack of the Comisión de Consumidores Particulares, maintaining its right until it obtained a favorable ruling from the Supreme Court. And yet its service to the country and the city had been invaluable; through great effort and sacrifice, it had made clearly important contributions to the city's modernization.

The company had been constituted in 1843 with a duration of 20 years expiring in 1863, and in the context of the existing change, the Sociedad Catalana had to decide whether to end its activity or whether, on the contrary, to continue with its work and contributions. It was an important moment — other such moments would appear later on — in which the special profile of the historical figure that Naturgy has been throughout its long history presented itself in all its greatness.

The General Shareholders' Meeting of October 16, 1862, called shortly before the loss of the public lighting contract, just three months before the company was defeated, clearly decided that the company should continue, but not for 20 more years, but for 60 years, and not with a mixed management contract, but directly exploiting its business, in a clear demonstration of vitality and drive.

130. Arroyo (1997), p. 8.

Table 23. Sociedad Catalana para el Alumbrado por Gas. Share capital (1843-1864)

Year	Share capital (<i>reales de vellón</i>)	Increase (percent)
1843	6,000,000	—
1853	8,000,000	33.3%
1855	9,200,000	15.0%
1864	12,000,000	30.4%

Source: NFHA.SCAG. *Asambleas Generales de Accionistas*.

In addition, the Articles of Association were modernized, with new governing bodies, a seven-member Board of Directors (equivalent to the current Board of Directors) was defined, and a six-member Supervisory Board (equivalent to the Supervisory Boards of German public limited companies) was set up to monitor the actions of the Board of Directors, which actually made the decisions. The chairman of the company was the chairman of the Board of Directors, but the chairman of the General Shareholders' Meetings was the chairman of the Supervisory Board. In 1884, one hundred and twenty years later, this separation of chairmen in the company's management would reappear.

The new Articles of Association additionally established the company's capital at 12 million *reales*, which represented an increase of 30% in the share capital, thus obtaining new resources with which to face the new situation of significant reorientation of the company's business from a financial point of view. The company obtained a temporary extension of the company while the approval of the new Statutes was being processed, approval which was provisionally obtained from the government by Royal Order of September 30, 1863¹³¹, and definitively in March 1864.¹³² (Table 23)

However, the company had already begun to prepare for what was to come, and once the lawsuit with the Comisión de Consumidores had been settled by the Supreme Court in mid-1863, and to protect itself from future competition from Lebon, it quickly proposed to its clients a reduction in the price of gas if they signed ten-year contracts with it, which in the 21st century we call *binding contracts*. The initiative was a spectacular success, and made it more difficult for

131. The necessary correction of mistakes and errors and the requirement to prove that the new shares provided for in the new Articles of Association had been issued and partially paid for lengthened the process until final regulatory approval was obtained. Royal Decree of March 23, 1864 (*Gaceta de Madrid*, March 28, 1864).

132. Sociedad Catalana para el Alumbrado por Gas (1864), pp. 1-31.

Lebon to win customers, and also made it clear that the citizens of Barcelona had confidence in the company.

To increase consumption, new uses of gas were also encouraged. In 1861, Manuel Duran Bas explained the situation as follows: “While in 1841 gas was used only for lighting, it is used today for various domestic purposes, such as cooking, heating rooms, and other things, as well as for many industries, and gas is needed for all these uses at all times of the day”.

In January of 1864, Félix Ribas, chairman of the Board of Directors of the Sociedad Catalana since its inception, died. Although no longer present, he left behind a company squarely facing the future. Mariano Franquesa, a lawyer who had been a member of the Board of Directors since 1857, was elected as the new chairman. He was an honorary minister of the Court and secretary of the Sociedad Económica Barcelonesa de Amigos del País, where he had been admitted on November 21, 1853; he participated in the Sociedad de Amigos de las Bellas Artes, and was director of the Centro General de Obligacionistas de Ferrocarriles. The new chairman resided at La Riera del Pino, number 15.

This period of turbulence in different aspects of the company’s life ended on June 3, 1864 with a General Meeting of the Sociedad Catalana¹³³, which marked the beginning of a new period by clearly bringing to an end the various ongoing disputes of recent years:

— **Dispute over lighting auctions.** After years of discussions with the City Council (1857-1863), several auctions and awards were subsequently cancelled and finally, in the auction held on December 30, 1863, the public gas lighting system in Barcelona was awarded to Charles Lebon, who was the only bidder who accepted the bases and offered the municipality a price of 84 cents of a *real* per cubic meter, although there were doubts as to the future profitability of this price given the local cost of coal.

The company had the right to continue supplying its private clients, to maintain the ownership of its gasworks and its pipelines for the natural lifetime of the pipelines (O.R. 23-03-1863). At that time, approximately 95% of the lights were private lighting. Furthermore, most of company’s customers were already bound to it with 10-year contracts.

133. NFHA, SCAG. *Asamblea General* (04-06-1864).

- **Comisión de Consumidores dispute.** The long period of discussions with the Comisión de Consumidores (1857-1863) had also ended with the Supreme Court's ruling of June 30, 1863 in favor of the company. The report to the General Meeting stated: "There is no longer any outstanding judicial question that can, because of its nature or importance, affect the company's functioning".
The day after the Supreme Court's ruling, the successful campaign to convert clients' contracts into 10-year contracts at a reduced price of \$1.25 *reales* per cubic meter began.
- **Extension of the company.** Approved by the General Meeting on October 16, 1862, for a period of 60 years, the definitive permit was not obtained until the Royal Order of March 23, 1864.¹³⁴ A long time, conditioned by the general political instability between the Unión Liberal of O'Donnell and the moderates of Narvaez, and also by the activism of Charles Lebon, who tried to block the permit by means of different exhibitions addressed to Queen Isabella II. But the company achieved its purpose and the period of 60 years began on January 29, 1863.
- **Company management.** In accordance with the new Statutes, the company was governed by a Board of Directors and a Board of Inspectors, and the Mixed Management stage (1849-1864) ended, although José Gil continued to manage the company as chairman until his death in 1877.
- **Financial statements.** Two financial statements for 1863 were presented to the Meeting, one for the period up to January of 28 and one for the rest of the year. The reason for this was that on January of 28 the initial duration of the company came to an end and, therefore, "the right to 10% of the profits reserved by D. Carlos Lebon expired" on that day.
- **Relations with Charles Lebon.** The chairman read a letter that Mr. Lebon had sent to the company for this purpose, in which he complained that he had not been summoned to the Meeting, and demanded the return of 50 shares. It was agreed that such a complaint was inappropriate and inadmissible. The story continued.

The General Meeting ended with renewed drive to overcome the problems of recent years, a situation that was explained by stating that: "Its growing prosperity [that of the Sociedad Catalana] provoked excessive ambitions that blinded some to the point of persuading them that the existence of the company was for them

134. Royal Decree of Authorization of H.M. of March 23, 1864 (*Gaceta de Madrid*, March 28, 1864).

the only obstacle to the realization of fabulous profits envisioned by them in their excitement".¹³⁵

After such an important General Meeting, the company had to continue building for the future, supplying only the private lighting of Barcelona, and facing competition from Lebon after he finished building his new gasworks in 1866. The company had to seek new areas of growth outside the city, either in its surroundings or in other parts of the country.

At the beginning of 1866, the territory of today's Barcelona had four gasworks: two in Barcelona, Lebon's (Gas Municipal) providing public and private lighting, and that of the Sociedad Catalana providing only private lighting, as well as that of the La Propagadora del Gas in Gràcia, and that of Agustín Rosa y Cía. in Sant Andreu del Palomar.

Faced with the changing circumstances, the Sociedad Catalan set in motion an ambitious external growth plan, which included the purchase of control of gasworks or companies outside Barcelona, such as Sant Andreu, Seville and Ferrol. New municipal contracts were also sought, such as in Sants (1876), or the installation of new pipeline networks to attract customers in other municipalities, such as Gràcia (1886). In order to meet the increases in consumption recorded in Barcelona, it enlarged the Barceloneta gasworks (1872).

The purchase of the Sant Andreu gasworks was completed in 1866, taking advantage of the departure of José Ramón Plandolit's company. It then began to turn the company around as Guardiola, Albiñana y Junyent, and with the Sociedad Catalana as the capitalist partner that really made the decisions. In the same year, the supply from the Sant Andreu gasworks to the La Sagrera district of Sant Martí de Provençals began. Later, in 1876, the lighting contract with the Sant Andreu Town Council was renewed, and in 1886 the supply to the neighboring municipality of Sant Joan d'Horta began.

The gasworks continued to operate, and in 1909 it began to receive its gas supply from the Barceloneta gasworks with a feeder, a gas pipeline. Its production activity was therefore closed in the first decades of the 20th century, and the same site was transformed into a gas station, practically operational until the arrival of natural gas.

The decision was also made to expand the Barceloneta gasworks to make gas available for business growth. The new facilities required the purchase of adjacent

135. NFHA.SCAG. *Asamblea General* (04-06-1864).

land to undertake the expansion of the gasworks.¹³⁶ In August 1875, the Barceloneta gasworks had: “32 ovens with five retorts and three ovens with three retorts in the weighing room. Two gasometers of 4,000 cubic meters, which are 8,000 meters and two of 800 meters each; a total capacity of 9,600 cubic meters of gas”.¹³⁷

Perhaps the most exceptional element of the expansion was the two telescopic gasometers that were installed, designed by Claudio Gil, with clear technological innovations that made them worthy of being considered as a contribution to the technology of the industry in the important *King’s Treatise on the Science and Practice on the Manufacture and Distribution of Coal Gas*.¹³⁸ Traditionally, gasometer tanks were made of cast iron, brick or cement. Claudio Gil’s contribution was to construct the tank out of concrete, which brought technical advantages and economic savings. The gasometer hood was 32 meters in diameter and 6.2 meters high, and was equipped with 12 cast iron guides to allow the telescopic mechanism to be operated and to adjust the interior volume to the required needs. The capacity of the gasometer was about 5,000 cubic meters. The first of these gasometers began its activity in 1877 and the other in 1879.¹³⁹ Some have assimilated the gasometer structure that has been maintained in the Parque de la Barceloneta to this gasometer by Claudio Gil, however, the preserved one has sixteen support guides, not twelve.

Purchase of the Seville Gas Company

As part of the strategy to expand the company’s activities in gas lighting outside Barcelona, small exploitations, such as Sant Andreu del Palomar, or larger ones, even if they were further away, were considered. However, most of the major cities, in 1866, were already in the hands of other groups. For example, gas in Madrid was controlled by the French *Crédit Mobilier* under the name of *Compañía Madrileña de Alumbrado y Calefacción por Gas*; Valencia, where the *Sociedad Valenciana para el*

136. Alayo y Barca (2011), pp. 115-117.

137. PFHA.SCAG. *Bernardo Ten. Notas desde el año 1875 al...* (1875-1932). Bernardo Ten was one of the supervisors of the Barceloneta gasworks for more than 50 years; in his notebook he wrote down the figures and important facts of those years. He began his activity in the gasworks on August 16, 1875, when the company’s director was José Gil and the gas engineer, Claudio Gil.

138. Newbigging and Fewtrell (1879); Bragulat (1990), pp. 1-14.

139. According to Bernardo Ten. The first one must have been built in 1876-1877, since García Martín indicates that Claudio Gil, in 1876, “is busy building a new gasometer for the Barceloneta gasworks”; in any case, the construction lasted nine months. García-Martín (1990), p. 41.

Alumbrado por el Gas de Valencia was under the control of the Marquis of Campo; and finally Malaga, at that time owned by the Société pour l'Éclairage de Malaga, headquartered in Lyon and controlled by Guillaume Vautier and Hippolyte Gautier.

On the other hand, it was clear that priority was to be given to cities with potential for growth and which could easily be supplied with the coal needed for gas production, thus ones close to the sea or a navigable river.

Such an opportunity arose in 1866 in Seville¹⁴⁰, when the owner of the gasworks, the Swiss General Bank, decided to set up a public limited company and opened the participation to new shareholders. José Gil Serra, the manager of the Barcelona company, was one of these new shareholders. Perhaps the marriage in Paris of his first-born brother, Pedro, to the daughter of wealthy Andalusian wine-makers, Josefa Moreno de Mora, in the 1850s, influenced the entry into Andalusia, or perhaps it was the fact that after Catalonia, the area of Spain where most gasworks were installed in the 19th century was Western Andalusia, mainly in the Gulf of Cadiz, because of its export dynamics and international relations.

The introduction of gas lighting in Seville had begun in 1846, when Carlos Karsniki, one of the founding members of the Sociedad Catalana para el Alumbrado por Gas in Barcelona, appeared in Seville with Lebon. He asked and got the City Council to rent him a piece of land to build a gasworks on. This time he did not represent Lebon as in Barcelona, but Manby and Partington, the Englishmen who would later install gas in Madrid, and who were partners in other gas businesses of the Marquis of Salamanca.

Strangely, the contract for public lighting was not requested, and the supply of private lighting began, probably in 1847. Perhaps it was considered excessive to want to compete with the Andalusian oil used in street lighting.

Afterwards, events of great strategic importance began to unfold at full speed: First there was the sale of the exploitation carried out by Edward Oliver Manby and William Partington on May of 29, 1850 to Gregory and Company, of London, for 80,000 *reales de vellón*. The partners of the English company were Jaime Federico Gregory, John Quafton, Edmund Elsdén and Richard Ward.

Then, in just two years, on November 8, 1852, Gregory & Co. sold the business to York & Co. for 75,000 *reales de vellón*, a price slightly cheaper than the original purchase price. The partners from York & Co were John Oliver York, Edmund Elsdén Goldmid and Joseph Adrian Maydien.

140. González García (1981), pp. 55-58.

The new company changed its focus from private lighting only to public lighting on December 12, 1853, when it won the contract for the public lighting of the City Council for a period of 30 years.

After a few years of some peace of mind, on February 5, 1860 York & Co. sold the Seville operation to the Swiss General Bank, which on June 25, 1866 set up the Sociedad Anónima para el Alumbrado por el Gas de Sevilla, to which it contributed the assets and the contract with the City Council. It should be noted that, at the end of 1865, there were 10,429 lights in Seville, of which 2,472 were public and 7,957 private. At the time, Barcelona had installed some 40,000 lights.

Here, the story paused for a few years, as José Gil Serra, a shareholder of the Seville company, devoted his attention to Cordoba, where he obtained the contract for the city's public lighting system in 1870 and the permit to build a gasworks and to install pipelines in its streets. Cordoba had been trying to acquire gas lighting since 1852; there had been as many as 12 attempts, but none had been successful, until the arrival of José Gil. The gasworks in Cordoba belonged to the Gil family, and specifically to the Gil Moreno de Mora branch, for many years, until 1919, when they created the Sociedad de Gas y Electricidad de Córdoba, in which later the Compañía Anónima Mengemor became a shareholder and would eventually take over the company.

Once the position in Cordoba was consolidated, José Gil Serra, by now managing director of the Sociedad Catalana para el Alumbrado por Gas, once again focused his attention on Seville. And so, in 1871, the Sociedad Catalana made an offer to buy the business of the Seville company in the following terms: valuation of the 6,000 shares of the company for a total amount of 9,120,000 *reales de vellón*, although the assets were actually bought and the shares were cancelled. The offer came at the right time, as on March 30, 1871 the General Meeting of Shareholders of the Seville company approved the transaction and, finally, on June 27 the actual transfer of ownership took place.

Thus, for more than 100 years, until the constitution in 1987 of Gas Andalucía, S.A., Seville gas was managed by the company that the Sevillians simply designated as "La Catalana". And also in this way, the Sociedad Catalana para el Alumbrado por Gas began to supply gas in Seville earlier than to the municipalities closest to its initial operation in Barcelona (Table 24).

The Board of Directors of the Sociedad Catalana that carried out this important expansion stage and assumed the risk of investing more than 2 million pesetas of the time in Seville, authorizing the proposals of the managing director, José Gil,

Table 24. Sociedad Catalana para el Alumbrado por Gas. Board of Directors (1871)

Name	Position
Joaquín Vehils Catá de la Torre	Chairman
Magín Via Blanch	Member of the Board
Juan Roig Sala	Member of the Board
Ramón Mestre Olivella	Member of the Board
Martín Masferrer Roig	Member of the Board
Vicente Oller Torroja	Member of the Board
Antonio Renart Sastre	Secretary

Source: NFHA. SCAG. *Junta Inspector y Junta Directiva (04-03-1871)*.

was presided over by Joaquín Vehils Catá de la Torre.¹⁴¹ It is important to note that the company's share capital at the time was 3 million pesetas.¹⁴²

General Manager José Mansana Dordán

In 1877, José Gil Serra died; he was a founder of the Sociedad Catalana, manager, member of the Board of Directors or managing director practically during the entire 34 years of the company's existence.

José Mansana Dordán was appointed general manager to replace him.¹⁴³ Mansana Dordán had started his activity in the company in 1845 as an assistant clerk, however, the rigor and discretion of his work allowed him to assume maximum responsibility after more than thirty years of work. He held the position of general manager until his death in 1892.

141. Joaquín Vehils Catá de la Torre was a lawyer, domiciled at Calle de Santa Ana, 11, Barcelona; he was chairman of the Board of Directors of the Sociedad Catalana from 1870 to 1876; González García (1981), p. 60; Madrid Calzada (2007), p. 146.

142. The financial consolidation of the acquisition of the Seville factory was carried out a few months later, on November 30, 1871, with an auction of new bonds for a total of 1,750,000 pesetas, with a 20-year maturity and a 7% interest rate, repayable by public annual draws, and with a mortgage guarantee of the industrial facilities in Barcelona and Seville. The offering was a success, with demand more than doubling supply, and allowed for an offering at prices between 100.25% and 104% of face value. *Almanaque del Diario de Barcelona para el año 1873*. Barcelona: Imprenta del Diario de Barcelona, 1872, p. 105.

143. Fàbregas (2012a), pp. 122-123.

The special character of José Mansana can be seen in the letter he sent to the Board of Directors on March 16, 1849, in which he requested to be put on the company's payroll after four years of working at the company, and after an initial seven or eight months in which he worked without pay:

To the Individuals of the board of directors of the Sociedad Catalana.

In 1845, when the administration of the Sociedad Catalana del Alumbrado por Gas saw the need to take on a salesman to regularly carry out its growing work, the undersigned came in, although with the understanding that at first he would not enjoy any salary, which I was satisfied with believing it would be for a short time. However, seven or eight months passed during which I constantly attended the performance of my duties without any reward, until I was granted, on an interim basis, twelve *duros* a month until it would be finally agreed for me to be on the payroll of the company.

Not having, therefore, yet resolved this point, and in view of the work having considerably increased without enjoying more salary for it, as the Manager May of report; I beseech the individuals of that board who, having heard the reports that the referred S. Ador May of give, will kindly include me on the staff and indicate to me the salary that you May of deem appropriate.

God who *V.V. m.a.*

Barcelona, March 16/849

José Mansana¹⁴⁴

Towards the middle of the century, José Mansana married. He had a daughter, Sofía, who married Joaquín M.^a Gustá, and a son, José Mansana Terrés, who was a worthy successor of his father.

During his years of management, the company grew in its distributions in Barcelona and Seville, and offers were made to the corresponding town councils to enter the neighboring municipalities of Barcelona and which were later added to it, such as — among others — Gràcia and Sant Gervasi de Cassoles. He also took unsuccessful steps to acquire the gasworks in Jerez de la Frontera and in 1884 he

144. NFHA.SCAG. *Carta de José Mansana* (16-03-1849) [Register 2545. Box 80].

Table 25. Société Technique de l'Industrie du Gaz en France. Number of members by geographical area (1884-1890)

Country	1884	1890
France	356	453
Spain	27	33
England	22	26
Belgium	27	25
Italy	8	11
Rest of Europe	15	27
Africa	8	11
America	3	4
TOTAL	466	590

Source: Societe Technique de l'Industrie du Gaz en France: *Compte Rendu du Congrès* 1884 to 1890 and by the author.

successfully acquired the gasworks and distribution in Ferrol from the Sociedad General de Alumbrado de España y Portugal.¹⁴⁵

Mansana Dordán was accepted into the most renowned European gas forums, such as The Gas Institute of Great Britain, or the Société Technique de l'Industrie du Gaz en France, which wrote on his death: "During the fifteen years that he was administrator of the Sociedad Catalana, he tripled the importance of the business of this company".¹⁴⁶

The Société Technique, created in 1874, was for various reasons the true world forum for the gas industry at the time, with partners from 22 countries in Europe, America and Africa. Mansana was a member since 1877 (cuadro 25).

In 1884, the Sociedad Catalana was the seventh largest European gas group in terms of the volume of its contributions to the Société Technique; this expansion and international recognition came from the quality of its leaders and the success of its strategy of seriousness and service.

José Mansana's entrepreneurial spirit also showed itself in his creation of a group of gasworks, which he built directly or acquired, known as Gas Mansana, and which formed the gasworks of Tortosa, Manresa, Sabadell and Manlleu.

145. Fàbregas (2006), pp. 220-221.

146. Société Technique de l'Industrie du Gaz en France (1893), p. 30.

A few years after his appointment as manager of the Sociedad Catalana, José Mansana began his great hobby in the field of culture, Japanese art, with the acquisition in Paris (1885) of some lacquered chairs that he later discovered to be false. Undeterred, three years later he made his first major purchase: he bought the *urushi*¹⁴⁷ pieces on display at the Japanese section of the 1888 Universal Exhibition in Barcelona; he thus began his contacts with the primary Japanese intermediaries in Europe located in Paris, such as Mr. Haiashi, who kept him abreast of the interesting pieces on the market. According to the experts, the collection was expanded and transformed into “one of the best collections of Japanese art in Spain”.¹⁴⁸

The Cases of Jerez, Cadiz and Ciudad Real

The appointment of José Mansana as General Manager gave new impetus to the search for opportunities for growth through acquisitions or new developments in Spain, taking into account the limitations of growth in Barcelona due to competition from the Lebon company and its good relations with the City Council.

Looking for opportunities in Spain at that time meant having to deal with networks of political and territorial interests of great importance and complexity, encountering families, connections, and interests of all kinds. Also great abundance of deputies to Cortes and senators, among them the *cuneros*, that is to say, those who had obtained a seat because the government had presented them but in territories far from where they carried out their activity, and with relations with credit companies and foreign interests of all kinds. It was a world built on relationships, influences and connections in Madrid.

Jerez de la Frontera (1879)

José Gil had already begun the search for opportunities shortly before his death in late 1877, when he commissioned the manager of Seville, Casimiro Farrán, to study in which new municipalities it might be interesting to install gas lighting. In the course of these studies it became evident, very quickly, that the head of the

147. The Japanese *urushi* lacquer is made from the sap of the *urushi* tree, or *Toxicodendron vernicifluum*, and is notable for its exquisite and meticulous quality.

148. Bru (2004), p. 248.

gasworks in Jerez de la Frontera, Salvador Sabater Arauco, was making similar efforts and in concurrence in different towns, such as Sanlúcar de Barrameda, Antequera and other municipalities.¹⁴⁹

The gasworks in Jerez was owned by prominent shareholders, of great social prominence and with important connections, figures who were typical of the Spain of those times. We are referring to: Ignacio Sabater Arauco, Salvador Sabater Arauco¹⁵⁰, Eduardo León Llerena¹⁵¹ and José García Rodríguez, who had set up the *Compañía Industrial Española para el Alumbrado y la Calefacción por Gas* in Jerez in 1877.

In addition, in the case of Ignacio Sabater, his experience in the world of gas was quite important. He had been director of the Lebon factory in Cadiz (1868-1871)¹⁵², and intervened as an intermediary in 1877 between the City Council of Malaga and the *Société pour l'Éclairage de Malaga*, also French and created in Lyon.¹⁵³

He took part in Lebon's purchase of the gasworks in Cadiz from Zacheroni et Cie. and the subsequent relations with the City Council, as well as in the procedures for obtaining the gas lighting concession for Puerto de Santa María (1868). Ignacio Sabater's services were very important, so important that he was the only Spaniard that the *Compagnie Centrale d'Éclairage pour le Gaz, Lebon et Cie.* incorporated into its Supervisory Board in Paris in 1868, indicating that he was its representative in Spain, a territory that was becoming increasingly important for its business.¹⁵⁴

149. NFHA.SCAG. *Junta Directiva* (12-01-1878).

150. Ignacio Sabater Arauco (1824-1889) was a native of Úbeda, a descendant of Catalan merchants, specifically from Tortellà (Girona), who had lived in the area for many years, while another part of the same family settled in Albacete. His public life began when he was elected deputy for Cazorla (Jaén) in 1864, followed by the acts obtained later by Vic and Berga (Barcelona), to finally be appointed senator for Burgos and then for Jaén, which brought his political activity to an end in 1880. His professional activities also began in 1864; he was the correspondent in Jaén for the *Compañía General de Crédito, Depósitos y Fomento*, which represented French interests and whose director, Gregorio López Mollinedo, had directed the Madrid gas company with the Marquis of Salamanca's group (1848-1856), until its definitive acquisition by the *Crédito Mobiliario Español* of the Pereire brothers. Sabater also obtained railway concessions, such as the one from Córdoba to Belmez for the *Compañía Internacional de Crédito* (1865), which he liquidated very soon, in 1869. One of his daughters, María Sabater Fernández, married Juan Montilla Adán, who was to become a prosecutor at the Supreme Court and Minister of Grace and Justice in 1902. A family with positions and relationships in the reign of Isabella II, as well as in the First Republic and the Bourbon Restoration, with permanent influence. *Apuntes para una historia de la banca en Andalucía*. See bancaandalucia.blogspot.com.es [consulted 02-01-2018]; Torres (2005), pp. 439-440; Simón Palmer (1989), pp. 60-74.

151. Eduardo León Llerena (1839-1900), a native of Antequera, was deputy to the Cortes for Alcalá la Real, Jaén and Martos, and was appointed senator for life in 1883. Regarding his political career it should be noted that he was married to a niece of General Serrano, who with Juan Prim and Admiral Topete would carry out the Revolution of 1868, La Gloriosa, and who would be successively regent, president of the Consejo de Ministros and last president of the executive power of the First Spanish Republic.

152. Fábregas (1989a), p. 15; Fernández-Paradas (2015), p. 71.

153. Fábregas (2003), p. 53.

154. Lebon et Cie. (1947), p. 45.

In view of the movements, in January of 1878 Ignacio Sabater offered to sell the gasworks in Jerez to the Sociedad Catalana, since he and his brother were committed to selling to third parties along with the rest of the partners or, if not, to sell to the other two partners led by Eduardo León Llerena.

The Sociedad Catalana did not raise the issue until a year later, in January of 1879, when it was explained that the reason for the delay had been: “the news of an invention by Mr. Edison on the infinite division of electric light, [which] placed the gas lighting company in check; and that prudence advised not to answer in the affirmative, nor to give a refusal that would end the negotiations....”. Once Edison’s invention had been analyzed and the short-term possibilities of it damaging the gas industry had been assessed, with no grave consequences, the issue of Jerez was taken up again. At that time, the owner of Jerez was already Eduardo León Llerena.

José Mansana travelled to Andalusia to deal with various matters and took the opportunity to visit Jerez, preparing a long report which he presented to the General Meeting at the beginning of April of 1879, recommending the acquisition, and setting a maximum price of 875,000 pesetas, which would be financed by the issue of 750 new shares of 500 pesetas each, that is, 375,000 pesetas¹⁵⁵, and the rest with the corresponding issue of bonds. The transaction was presented and approved by the General Shareholders’ Meeting held on April 30, 1879.¹⁵⁶

The gasworks in Jerez was created in 1860 by the Compañía General de Crédito in Spain. After four years it suspended payments, and in 1865 sold the gasworks at auction to a group of Dutch capitalists backed by the Bank of Antwerp, along with other assets of the same origin. In a short time the Dutch company had to abandon the service due to the poor condition of the gasworks and the pipes. For the outstanding debts, the Spanish Treasury seized the facilities in 1872 and sold them to José García Rodríguez in 1873. For his part, Salvador Sabater won the lighting contract with the Jerez City Council for 20 years, which was signed on March 12, 1873. Salvador Sabater and José García¹⁵⁷ joined forces the same year with Ignacio Sabater and Eduardo León, and in 1877 created the Compañía Industrial Española

155. At that time the share capital was represented by 7,500 shares of 500 pesetas, representing a total of 3,750,000 pesetas. Therefore, the Jerez operation represented issuing one share for every 10 existing shares, increasing the capital to 4,125,000 pesetas.

156. NFHA.SCAG. *Junta Directiva y Junta Inspectorá* (01-04-1879 y 04-04-1879) y *Asamblea General de Accionistas* (30-04-1879).

157. Arroyo (2006a), p. 11.

para el Alumbrado y la Calefacción por Gas, which was the owner at the time of the talks with the Sociedad Catalana.¹⁵⁸

The agreement seemed to work and in the first weeks of May of the deed of sale began to be prepared under the hypothesis that Eduardo León was offering the gasworks with no outstanding debt, and that Salvador Sabater was offering the concession from the City Council. Problems began to appear at the end of May, when the legal advisor of the Sociedad Catalana discovered that the gasworks and land were mortgaged together with the assets of the other gasworks owned by the Compañía General de Crédito in Spain (Valladolid, Burgos, Pamplona and Cartagena), as collateral for 5 million *reales* in fifty thousand bonds issued by that company, and for their interests and coupons. There was also the gasworks for the guarantee of 4 million *reales* owed by the Dutch company to the Compañía General de Crédito, and additionally it still guaranteed some further operations. An attempt was made to maintain the operation by giving the seller until September 30 to remove the debt so that it could then be carried out.¹⁵⁹

In July, however, new and more complex issues arose; the Board of Directors stated: “The obligations, despite their importance, were not what ultimately drew the most attention, but rather a much more important one: ownership of the gasworks, whose legitimate acquisition by the seller or its successor was considered unstable, as if exposed to a highly serious challenge”.¹⁶⁰

The details that had come to light and that had generated that degree of concern stemmed from the fact that when the Treasury had seized the gasworks in Jerez and taken it to public auction to collect its debt with the Dutch company, the legal procedures had not been strictly followed. The first auction that was held was deserted because no one was interested, and a second auction was subsequently announced, “after *retasa*”¹⁶¹, setting a new starting price of 222,222.17 pesetas, which likewise found no bidders. José García Rodríguez subsequently appeared and offered 78,701.75 pesetas, and was awarded the legal contract. In contravention of the applicable legal provisions which stated that “the property could not be

158. NFHA.SCAG. *Junta Directiva y Junta Inspectorá* (25-01-1879).

159. NFHA.SCAG. *Dictamen sobre cómo pagar la compra del gas de Jerez* (20-05-1879) y *Junta Directiva y Junta Inspectorá* (27-05-1879).

160. NFHA.SCAG. *Junta Directiva y Junta Inspectorá* (07-07-1879).

161. The word *retasa* was used to indicate the reduction made in the price of items put up for auction and not auctioned off.

awarded to any private individual outside of an auction, or for less than two thirds of the appraisal".¹⁶²

The Sociedad Catalana was left in a difficult situation, as it had already put into circulation the new shares destined for the purchase, but finally on July 7, 1879 it ended the deal with Eduardo León on the possible purchase of the gasworks in Jerez; it preferred to act in correct legal terms rather than take advantage of business possibilities.

Soon after, the gasworks in Jerez was acquired by Crédito Mobiliario Español, which acted according to other criteria, and was placed under the aegis of the Madrid gasworks, which at that time was owned by the Compañía Madrileña de Alumbrado y Calefacción por Gas, a company belonging to the same group of companies of French origin.

Cadiz (1883)

The relationship of the Sociedad Catalana with Ignacio Sabater and his circle did not end with the termination of negotiations related to the gasworks in Jerez; shortly after, in 1882, a new chapter began in Cadiz.

The gasworks in Cadiz belonged to Lebon and had a concession that expired in 1884. The Sociedad Catalana, seeing opportunities for business in the city, began to pull strings two years in advance, when on September 29, 1882, the engineer Federico Gil de los Reyes¹⁶³ addressed the mayor of Cadiz to request that when the Lebon contract expired, it should not be automatically renewed, but should go up for auction.¹⁶⁴

The City Council began to give this consideration, but on January 4, 1883 a Royal Decree appeared from the Minister of the Interior, Venancio González, on the contracting of public services by the city councils, which obliged them to be awarded by auction and which in fact replaced the Royal Decree of February 27, 1852, attempting, in a very regulatory style, to subject the contracts of city and provincial councils to the requirement of auction; these councils normally acted without complying with the requirements established by the government, due to the lack of the necessary regulatory developments. In autumn 1883, the City

162. NFHA, SCAG. *Junta Directiva y Junta Inspectoras* (07-07-1879).

163. Federico Gil de los Reyes, future entrepreneur of the gasworks of San Fernando, at this time represented the interests of the Sociedad Catalana in Cadiz.

164. Fàbregas (1989a), pp. 12-24.

Council finally decided that it would auction off the gas contract, which expired on January 4, 1884.

At this point, Ignacio Sabater reappeared defending Lebon's interests, appealing against the City Council's decision. However, the press had already announced that the Sociedad Catalana para el Alumbrado por Gas would be a bidder at the auction.¹⁶⁵ The issue culminated on December 5 with the official convening of the auction, with the bases incorporating the progress clause.¹⁶⁶ Ignacio Sabater filed another appeal against the decision, while *La Palma de Cadiz* published an alleged telegram from the Sociedad Catalana indicating that it would not appear at the auction, a manipulation only intended to produce disorientation. An early version of fake news or post-truth.

When Lebon's contract came to an end on January 4, 1884, and as nothing had been decided, it was declared expired, but was tacitly extended until a solution was found. During the following months Sabater's discussions continued with the City Council, while public positions quarreled between the Lebon company in favor of the legal renewal of its contract, and the Sociedad Catalana in favor of the auction. Finally, due to the failure of the municipality to call for an auction in the following months, the company announced that it was definitively withdrawing from Cadiz. On November 22, 1884, the City Council definitively extended the Lebon contract. Shortly after, on January 4, 1885, the citizens of Cadiz grouped together and created their own gas company, the Sociedad Cooperativa Gaditana de Fabricación de Gas. Cadiz would thus be one of the few Spanish cities with two gasworks.

Ciudad Real (1883)

The case of Ciudad Real¹⁶⁷ is another example of the intense activity at the time in Spain concerning gas contracts, concessions and gasworks, from different approaches, but in the cases presented here having some relation to the Sociedad Catalana para el Alumbrado por Gas.

In the early 1880s, Georges Bower, an engineer and gasworks contractor based in St. Neots, in the county of Huntingdon, England, received from the City Council

165. *La Palma de Cadiz*, 23 de noviembre de 1883; *Diario de Cadiz*, 24 de noviembre de 1883.

166. *Boletín Oficial de la Provincia de Cadiz*, December 5, 1883. The progress clause referred to the fact that if, during the course of the contract period, other lighting better than gas and cheaper than gas appeared, the contract would be terminated or would have to be adapted to the new circumstances.

167. Fàbregas (1989b), pp. 1-6.

of Ciudad Real a perpetual right to install gas pipes in the city's streets. He then built and started up a gasworks in the town, using the coal from some mines near Puertollano.

It is a strange case because the businessman was not interested in initiating public lighting, as was normally the case elsewhere in Spain. Public lighting allowed the activity to start with a certain base volume that was later gradually complemented by private lighting, which was more profitable due to its price, but of slower penetration. Bower's original policy, expressed in his words, was: "There is no contract of any kind with the municipality, except the perpetual right to lay the pipes. I have no concession and I do not want any. The works are mine alone and with the perpetual right to lay pipes. I prefer this to a concession, as I am my own master".

The advantage of Georges Bower's procedure was that it drastically reduced dependence on the City Council in every respect, but it also made the return on the investment far more distant. The initial relationship with the City Council was only to obtain a permit, if possible a perpetual right, to install the pipes in the streets. When the gasworks was built and operated with private customers, a public lighting contract was negotiated with the municipality, but as a new customer, obviously an important one, but still a customer, after all, of an existing gasworks, which had not been built basically for the municipality and therefore did not clearly require a concession. Maturation was slower, but the municipality had less desire to keep the gasworks at the end of the contract. It was simply another strategy.

Once the gasworks was built and at time when he had only 47 private customers and around 1,600 meters of pipelines installed in the streets, and was beginning to negotiate a public lighting contract, Bower commissioned a representative of his, Frederick W. Nash from London, to offer to sell the operation to the Sociedad Catalana para el Alumbrado por Gas, providing them with the plans of the gasworks¹⁶⁸ and the corresponding details.

Contacts and correspondence between Nash and the Sociedad Catalana continued during 1883, but without any results. The small size of the gasworks and the lack of a public lighting contract probably left the company unconvinced, and at that time it was involved in other efforts to acquire the contract in Cadiz. In the following years the gasworks in Ciudad Real changed ownership; J. O'Farrell appeared as the new owner at least until 1901.

168. NFHA.Gas Ciudad Real. *Plan of land Ciudad Real Gas Works* (1883).

The cases of Jerez de la Frontera, Cadiz and Ciudad Real were each different, but shared the common interest of the Sociedad Catalana para el Alumbrado por Gas to expand its activity to new municipalities. The other parties were in one case Spanish, and in the others a French company and a British businessman. For various reasons, these efforts ended without the company having been able to extend its activity to new territories, but its interest to do so would continue.

Purchase of the Gasworks in Ferrol

Continuing the Sociedad Catalana's strategy of looking for gas operations outside Barcelona, in 1884 it was Ferrol's turn. The history of gas in Galicia¹⁶⁹ had begun in 1855 with the constitution of the Sociedad para el Alumbrado de Gas of the city of La Coruña by the Frenchman Louis Lacy, after previous failed attempts by the Compagnie Générale Provinciale du Gaz (1844), and by William Partington, partner of the Marquis of Salamanca in the project of Madrid (1846).

Years later, Santiago de Compostela would follow, where Menéndez, Valdés y Compañía of Gijón was awarded the municipal lighting contract in 1872. Here too, there were previous attempts by French, English and Spanish companies (Compañía General de Crédito en España, Thomas Rumbell, E. Víctor y Cía., and Centro Científico e Industrial de Barcelona).

Ferrol was the third city to join the ranks of the modernity of gas lighting with the award of the contract to the Sociedad General de Alumbrado de España y Portugal, of Barcelona, in 1882. Finally, Vigo received an offer from the company from La Coruña, and was awarded the lighting contract in 1882. The company was restructured and the Société Anonyme d'Éclairage, de Chauffage et de Force Motrice de La Corogne et Vigo was created, which put the lighting into operation two years later.

The case of Ferrol is particularly interesting because it is where the Sociedad Catalana para el Alumbrado por Gas decided, in 1884, to invest after the failed attempts of Jerez and Cadiz (1879-1883), through the acquisition of the contract and the installations from its owner, the Sociedad General de Alumbrado de España y Portugal.

Like other cities, Ferrol had received many offers to install gas lighting, at least since 1861, with no practical results. Among the proposals were those by John

169. Martínez, Mirás and Lindoso (2009), pp. 109-144; Fàbregas (2014a), pp. 46-47.

Barret (1861), John Aird & Son (1862) and René Marchesseaux (c. 1862).¹⁷⁰ Later, William Knight & Co. won the contract without an auction in 1864, but lost it two years later because no concrete action was taken. This was followed by the offer of the Gas Hidrógeno Económico de Barcelona (1868), without results, and many years later by James Bolland, who repeated the same story: he won the award (1878) but did nothing. In short, in 1882, the Ferrol City Council had been through 20 years of offers without any results.

The Sociedad General de Alumbrado de España y Portugal won the contract on January 10, 1882¹⁷¹, for a period of 35 years; the City Council acquired the obligation to cede the land to build the gasworks, which was inaugurated on May of 7, 1883, and whose director was Jean Pierre Prouvat de Guery.

An important peculiarity was the technology used, as the gasworks, instead of distilling coal to produce the lighting gas, which was the technology normally used, was designed to operate using shale oil, producing what was called Rico gas.¹⁷²

The introduction of Rico gas in Spain had begun with the agreements with the developers of the technology, Rieber and Gruner of Basel, with the Frenchman Adolfo Nait, to whom they granted the exclusive right to introduce it into Spain and Portugal (1880); later the first installation was carried out in Blanes (Girona). The promising prospects led to the constitution of the company Nait, Vilaseca y Cía. in Barcelona in 1881, which managed to install the technology that same year in the gasworks of Coromina, Salas y Cía.¹⁷³ in Sabadell, and also in Palafrugell (Girona), at the same time as contacts were initiated with Huesca, Ávila, Las Palmas, Chiclana, Motril, Écija, Vigo, Ferrol, Barbastro and Rubí.

These promising beginnings led to the incorporation in the same year of the Sociedad General de Alumbrado de España y Portugal¹⁷⁴, a larger company with

170. As Mercedes Arroyo points out, René Marchesseaux was the son of Lebon's engineer, Léger Marchesseaux.

171. NFHA.SCAG.FERROL. *Escritura de contrata del alumbrado público de Gas en Ferrol entre el Ayuntamiento y la Sociedad General de Alumbrado de España y Portugal* (10-01-1882).

172. In Spain, in addition to coal gas, in some cases Humbert gas, Rico gas or Arbós gas was used. In the case of Ferrol, Rico gas was produced, which was obtained by heating liquid hydrocarbons or shale oils. It was a technology that had been initiated in the lighting of Liverpool and Hull (United Kingdom). The technology used in Ferrol was developed by Rieber and Gruner of Basel (Switzerland), who introduced a vertical spherical retort in the installations. Alayo and Barca (2017), pp. 148, 154-155 y 321. The oil was obtained from bituminous schist usually by pyrolysis, giving rise to what we would modernly call shale-oil, and was widely used to provide light to coastal lighthouses.

173. Agreement between Mr. Rieber and Mr. Gruner, from Basel (Switzerland), builders with privilege for the manufacture of Rico gas due to the decomposition by fire of liquid hydrocarbons, on the one hand, and the company incorporated in Barcelona (Spain) under the company name Nait, Vilaseca y Compañía on the other, on February 1, 1881 (*Gaceta de Madrid*, December 12, 1881).

174. Articles of Association of the Sociedad General de Alumbrado de España y Portugal, on November 15, 1881 (*Gaceta de Madrid*, December 12, 1881).

another category of shareholders, such as Joaquín de Cabirol Pau and Javier Tort Martorell¹⁷⁵, who acted as managing director and secretary of the company respectively. The share capital in the constitution was set at 7 million pesetas, when the Sociedad Catalana at the same time had only 4,125,000 pesetas of capital, a grandiosity evident in the initial provisions.

While the Ferrol contract was won in 1882, and the gasworks was inaugurated in May of 1883, the following month problems began with the consumption tax that had to be paid on the barrels of shale oil unloaded at the port of Ferrol. The supplier was the Société Lyonnaise de Schistes Bitumineuses. The disputes were between the company and the tax administrator; the company, on the basis of the conditions of the municipal contract, argued that its raw material was exempt, while the consumption manager felt otherwise. This discussion would go on for many years, and put serious strain on the Ferrol operation.

Due to the above mentioned tax dispute or for other reasons, soon after, the Sociedad General de Alumbrado began to take steps to sell its gasworks and contract in Ferrol, for 250,000 pesetas. The Sociedad Catalana para el Alumbrado por Gas de Barcelona was interested, and after an opportune and difficult negotiation, it signed an agreement to buy the installations and contracts on December 1, 1883 for an amount of 158,647 pesetas, just 7 months after the inauguration of the gasworks.¹⁷⁶

In a few months, the Sociedad Catalana replaced the manager Prouvat de Guery with a member of its organization, Pelegrin Fuster, who remained at the helm until 1898, when the company's presence in the city ended.

Gas lighting in Ferrol faced different problems, in terms of the above-mentioned taxes but also the raw material and the process used, which produced a gas with a high calorific value that made the engines work better, of which only a few existed in the city, but which produced weak lighting power, which gave private customers and the City Council the sense that the product that was not as good as that of other cities.

175. Joaquín de Cabirol had been a member of the Cortes in 1858, 1864 and 1876 for Girona and Barcelona and Javier Tort was a member in 1884 and 1896 for Lleida and Tarragona. Both were members of the elite *Círculo del Liceo* in Barcelona, and held the presidency in 1879 and 1910, respectively. Additionally, Javier Tort was later a councilor of the Barcelona City Council (1884 and 1889).

176. Arroyo (2006b), p. 50. The agreement was made a public deed on January 14, 1884. After this activity, no further activity of the Sociedad General de Alumbrado de España y Portugal, which disappeared from the area, is known.

But the Sociedad Catalana had the experience and the means to try to improve the situation, as Mercedes Arroyo points out: “La Catalana had already shown its organizational efficiency in 1871 with the Seville gasworks”.¹⁷⁷ Within a few months, the general manager, José Mansana, was in Ferrol, and proposed to the City Council the possibility of building a new gasworks on another site, but this time producing the gas from coal, and modifying various articles of the lighting contract. The City Council created a commission to study the issue in 1884, and another in 1886, but no progress was made and the negotiations broke down.

The situation became Dantesque when the customs tariff on shale oil was changed from 0.41 to 21 pesetas per 100 kilograms, an increase of more than 50 times.¹⁷⁸ The Sociedad Catalana again quickly claimed to be able to change to coal in 1889, indicating that the only alternative was closure. But when the company finally accepted all the conditions imposed by the City Council and the agreement could therefore be signed, councilor Juan Antonio Dans proposed switching from shale, not to coal, but to electricity. All this led to new inaction, forcing the supplier to increase gas prices to cover the new tariff on shale oils. Consumers reacted with a strike of lights against the City Council on August 3, 1890, for not allowing the Sociedad Catalana to produce with coal.¹⁷⁹

All these situations impeded clear progress in the improvement of the lighting in Ferrol, with constant disputes between the company and the City Council; meanwhile, time went by and electricity’s moment was approaching, which would force matters to a head.

In October of 1893, the City Council initiated a procedure to terminate the contract of the Sociedad Catalana, and the following month, it called a competition to award the electric lighting of the city.¹⁸⁰ Coincidentally or not, a few months later, in January of 1894, Antonio Togores, who was building an electricity plant, asked for permission to lay cables in the streets. The accidental mayor Andrés Ortega granted it to him in just two days, and with this initiative the idea of holding a public competition was abandoned.¹⁸¹

177. Arroyo (2006b), p. 52.

178. Law of May 12, 1888, amending headings 6, 7 and 8 of the Customs Tariff in force, relating to the importation of oil (*Gaceta de Madrid*, May 15, 1888).

179. Arroyo (2006b), pp. 73, 78 y 92.

180. City Council of ferrol (22-11-1893): *Pliego de condiciones para contratar el alumbrado público de la ciudad del Ferrol por medio de la electricidad*. El Ferrol.

181. Martínez, Mirás y Lindoso (2009), p. 282.

That same year of 1894, the promoters of electricity constituted the *Eléctrica Popular Ferrolana*, with capital of 250.000 pesetas¹⁸², presided over by Antonio Togores, who had been mayor of Ferrol in the period 1879-1881, and with diverse shareholders, among them Justo González Salorio, coincidentally the concessionaire of the collection of the tariffs on the shale oil. The company inaugurated its electricity s life was shorthale oilcity...he sense that the he gasworks of San Fernando, at this time represented the interests of the Socplant in 1895, although its life was short, as in 1903 it became part of the *Sociedad General Gallega de Electricidad*, the company that truly generated modern electricity in Galicia.¹⁸³

The termination of the gas lighting contract came to a definitive end with the decision of the Contentious-Administrative Court of La Coruña (1895), and by the resolution of the appeal to the Council of State (1898), which ruled in favor of the City Council¹⁸⁴, and so the *Sociedad Catalana* ended its activity in Ferrol on April 30, 1898. It should be noted that, in the continuity of the dispute over the shale oil tariffs, the central courts ultimately ruled in favor of the Barcelona company, but years after it had left Ferrol.

In the expansion of the *Sociedad Catalana* outside Barcelona, Ferrol was a singular case, as it had appeared very late, when electricity had already begun to appear on the horizon. The Ferrol experience was short-lived, the pressure of the City Council and some councilors, eager to open the way for the *Eléctrica Popular Ferrolana*, produced a series of disputes over the quality of the service and the dynamics of payment, which led to the closure of the gasworks in 1898, in a context of heated disputes both judicial and extrajudicial, which lasted many years.

With time, the other gasworks located in Galicia, by now in the orbit of *General Gallega de Electricidad* and *Fuerzas Eléctricas del Noroeste (FENOSA)*, also closed their doors: Santiago in 1916, Vigo in 1952 and La Coruña in 1958. Many years later, in 1998, gas would return to Galicia, now in the most modern form of natural gas, supplied by Gas Natural SDG.

The beginnings of gas in Galicia began with French, Asturian and Catalan entrepreneurs, who formed the backbone of a new reality at the beginning of the industry. Over time, the roots of the gasworks in La Coruña, Santiago and Vigo were joined together in *Unión Fenosa*, while the roots of the Ferrol gasworks continued

182. *Estatutos de La Eléctrica Popular Ferrolana*. El Ferrol: Imprenta de *El Correo Gallego*, 1894; Carmona (2016), pp. 31-32.

183. Arroyo (2006b), pp. 93, 108 y 109.

184. Martínez, Mirás and Lindoso (2009), p. 283.

in Gas Natural SDG. All the threads were rejoined in 2009 in the then Gas Natural Fenosa, 155 years after the beginnings of gas in Galicia.

The Movements of Lebon and La Propagadora

The Sociedad Catalana's competition in the area of Barcelona was Lebon and La Propagadora del Gas, which in these years built gasworks and adapted their strategy to the new realities of the surroundings, including reaching agreements between the two companies.

Lebon's El Arenal Gasworks (1866)

When it obtained the contract for the public lighting in Barcelona, but was unable to appropriate the private lighting customers of the Sociedad Catalana and its gasworks and installations, Lebon had to build a new gasworks named Gas Municipal, which, when the contract expired in 1880, had to be transferred to the City Council. But the weakness of its position over time prompted Lebon to consolidate its position with other gasworks it already clearly owned in order to be able to continue with the activity, regardless of the circumstances. This was the context of the purchase of La Propagadora del Gas (1883) and the construction of a gasworks in Sant Martí de Provençals (1889).

Lebon built the new Gas Municipal gasworks on a plot of land of considerable length and little width, situated between the railway line and the Bogatell beach, between the towns of Barcelona and Sant Martí de Provençals; it covered the area from the right side of the Bogatell beach to the old Camp de la Bota road, an area currently occupied by the two towers of the Villa Olímpica.

After the opening of the El Arenal gasworks in 1866, Lebon had the capacity to supply Barcelona's public lighting and replace the Sociedad Catalana. In addition, the Lebon company tried to expand its business into the neighboring municipality of Sant Martí de Provençals, but initially the Barcelona City Council, in whose name Lebon was billing, forbade him to use the gas from his gasworks, in theory belonging to the municipality, to supply gas to another municipality (1868).

Later, in 1875, Lebon managed to sign an agreement with Sant Martí to supply the public lighting, lasting 20 years, and agreed that the company would respect the already established supply made by the Sant Andreu gasworks to the Sagrera neighborhood.

During 1866, activity by the previously mentioned Comisión de Consumidores Particulares de Barcelona was revived. The reason this time was the poor service it felt the Lebon gasworks provided both to the street lighting and to private customers, compared to the previous service offered by the Sociedad Catalana. Within a few years, the Comisión de Consumidores went from criticizing Barcelona's established gas company to using its service as an example to show the shortcomings of the service provided by Lebon and his Gas Municipal.

At the end of the seventies, Barcelona would once again be entangled in the gas issue, because the City Council decided to impose a new municipal tax on the fluid. Citizens were upset and the Comisión de Consumidores acted, calling for a strike of lights to publicly protest against the new tax. The strike was widely followed and the city's shops and businesses kept their gaslights off to likewise join in the protest. The situation continued until finally, in 1879, the City Council was forced to withdraw the tax, and calm returned to the gaslights. For once, the gaslight was the symbol of civil society in the face of an abusive authority.

From another perspective, a period of change was approaching. In 1872, the management of the Compagnie Centrale in Paris changed. Eugène Lebon, son of Charles Lebon, decided that his father should leave the management of the company, given the inability to adapt to the new times of the style and character of the indomitable patriarch of the family. The growth of the industry and the crisis of the Franco-Prussian war had produced an important change of circumstances that required a different approach and other lines of action. Charles Lebon died five years later, in 1877.

In 1880, the Gas Municipal contract ended and the Barcelona City Council, after the appropriate procedure, decided to extend its existence for another 15 years, until 1895, on the same basis that it would be managed by the Lebon company and the City Council would have the right to keep the gasworks at the end of the period. The liquidation of the first agreement was carried out in 1883 and Lebon, unconvinced by the situation, quickly undertook two actions, as indicated above: the purchase of the installations and lighting contracts of La Propagadora del Gas, located in the town of Gràcia (1883), and the construction of a new gasworks in the neighboring municipality of Sant Martí de Provençals (1889).

The New Strategy of La Propagadora (1883)

Since the inauguration of the lighting system in Gràcia (1853), La Propagadora del Gas had expanded and developed its activity. It had begun to supply neighboring

towns, both through the extension of pipelines in Sant Gervasi de Cassoles (1866) and through winning public lighting contracts with the town councils of Sarrià (1877) and Les Corts (1877).

In 1883, Lebon and La Propagadora del Gas reached an agreement by which the former acquired all the facilities, contracts and customers in Gràcia and surrounding municipalities. La Propagadora would later redirect its activity with the acquisition or construction of gasworks in the Maresme and the Vallès, far from the extreme competitive activity of the Barcelona area.

With this acquisition, the business balance of the gas industry in the Barcelona area was established with two gasworks belonging to the Sociedad Catalana (those of Barceloneta and Sant Andreu del Palomar), and two others belonging to Lebon (El Arenal and Gràcia).

After this sale, the Gràcia gasworks continued its activity, but for a long time it held discussions on the opening of the future street of Corsica, the last one in the Eixample on the municipal limits, which was to cross the grounds of the gasworks. In 1891 the City Council of Gràcia started proceedings to open the street, but years later it was still unresolved, so the owners of the properties located on this street visited the mayor of Gràcia “to ask him about the opening of this street in the section that is obstructed by the gasometer located on the mentioned street”.¹⁸⁵

The annexation of Gràcia to Barcelona in 1897 established other priorities, so that in 1904 the mechanical maintenance of the furnaces was still carried out, and in 1910, the renovation of the mechanical installations. The closing date of the gasworks is not known, but when the Sociedad Catalana acquired Lebon’s assets in 1923, the gasworks was no longer in operation and its network was supplied from the Sant Martí and El Arenal gasworks.

La Propagadora del Gas, after selling its gasworks in Gràcia to Lebon, now clearly had neither industrial facilities nor industrial activity, but it did have financial possibilities, obtained through the sale process. In this context, two alternatives were proposed: to return the money to its shareholders or to seek a new industrial project.

The managing director of the company, Antonio Rovira Borrell, proposed continuing with the industrial activity, obviously outside the historical area of Gràcia, and this option was approved. Immediately, a period of feverish activity began, examining the possibilities and alternatives of reorienting the company’s actions.

185. *La Vanguardia*, March 30, 1894.

In a short time the route was clear and some land was purchased in Premià de Mar (1883) where a new gasworks was built and inaugurated the following year. In addition, in 1884, the company bought the gasworks in Badalona, and two years later, the one in Terrassa. The sale of Gràcia had made it possible to make the great leap forward, and to move from owning one gasworks to three.¹⁸⁶

La Propagadora del Gas, in its new area of the Maresme, faced a peculiar situation, as there were many municipalities that were relatively close, but not large enough to make a gasworks profitable in each of them, which had been the gas industry's only solution until then. Antonio Rovira Borrell came up with a new, truly original approach: to build a larger gasworks in the main town and supply the rest by pipeline. This innovation, the discovery of both the benefits of economy of scale and the fact that production and distribution are two very different phases of the same business, was a true contribution of La Propagadora del Gas to the European gas industry, and the Société Technique de l'Industrie du Gaz en France expressed its appreciation and gratitude for this contribution. With these new approaches, gas expansion would be easier.

Lebon and the Sant Martí Gasworks (1889)

In the same year, 1883, when it acquired the gasworks in Gràcia, on September 28, Lebon renegotiated and signed a new lighting contract with the Town Council of Sant Martí de Provençals, a municipality close to Barcelona, with some very important changes.

In order to reduce the price of the gas supplied to the municipality, it obtained the authorization to build a gasworks in the municipality, but without committing itself to establishing it. The municipality, on the other hand, did not want to acquire it under any circumstances, i.e. a clear difference in relation to the Barcelona contract with Gas Municipal, which was the major threat to Lebon's positioning in the territory.

The Town Council stated in the contract: "The company is now authorized to build a gasworks where it finds best, on its own account and property, with its gasometers and other facilities in the municipality of San Martin de Provencals", and explained its decision to abandon the acquisition of the gasworks as follows: "even though it [the Town Council] waives the right to acquire the gasworks and accessories which the company is authorized to build in San Martí de Provencals,

186. Arroyo (1992), pp. 2-3; Sudrià y Aubanell (2017), pp. 50-70.

as the gasworks does not exist today and the company is under no obligation to build it, of course it does not waive any positive rights'. A fine piece of legal disquisition in 1883.

On the other hand, the duration of the contract, which was set at 20 years in 1875 and which ended in 1895, was extended for an additional 30 years, bringing its end to a distant 1925. Once the contract was won, Lebon did not begin work on the gasworks until 1887, and it was finally inaugurated in 1889. Gas would be distributed from the Sant Martí gasworks to Sant Martí de Provençals, Poble Nou and Barcelona.

Therefore, around 1890 there were five gasworks in the Barcelona area: three belonging to Lebon (El Arenal, Gràcia and Sant Martí) and two to the Sociedad Catalana (Barceloneta and Sant Andreu). It should be noted, however, that the Barcelona City Council still retained its rights over the El Arenal gasworks and that Gas Municipal continued to exist.

The Lampposts of Gaudí and the Universal Exhibition of Barcelona

The final years of the 19th century were the prelude to great changes. Electricity appeared, with its spectacular effects on both public and private lighting habits, forcing gas companies to either renovate themselves and compete, or simply fall into decline and disappear. The Sociedad Catalana faced this period with a new top executive, José Mansana Terrés, a person with profound preparation who would lead the company for more than 30 years.

Those were still years of splendor for gas lighting in city streets; in Barcelona, famous architects, such as Antoni Gaudí or Pere Falqués, designed gas streetlamps. The great gas rivals in Barcelona — the Sociedad Catalana and Lebon — had to reach agreements to face the common enemy, the powerful multinational electricity companies, and they reinforced their solidity and commitment through the construction of corporate headquarters by renowned architects.

In 1888, the Universal Exhibition was held in Barcelona, the first of the major events that brought dynamism and projection to the city. Later came the Exhibition of 1929, the Eucharistic Congress in the 1950s and the Olympic Games in 1992. After this last big event, the development and style of Barcelona changed and a new path of structuring began with a prominent position in international tourism and with world technological congresses such as the Mobile World Congress, held in Barcelona since 2006.

But the 1888 Exhibition changed Barcelona. An exceptional testimony is provided by the politician and writer Frederic Rahola, who gave a careful description of the industrial environment of the coast between Barceloneta and the Besòs River in a well-known newspaper article¹⁸⁷:

...we met at eleven o'clock in the morning at the Estación de Francia, impatient as long as we remained under the iron shed, warmed by the sun, in that space saturated with the smell of coal and where one deafly perceives all the buzz of the city from which we wanted to be already far away.

We finally left the station, but the city with its long tentacles still imprisoned us: even the trams were still running beside us, and on the Paseo del Cementerio the carriage of the dead evoked our sadness. Then the iron bridge of the Exposición, the grey façade of the Palacio de la Industria, the flattened and reddish bullring, the row of old wagons out of service like a battalion of invalids, the gasometers resembling colossal witches' cauldrons with their keys piercing the air like kabalistic signs, the wine warehouses, the smoky chimneys of the factories, slid past before our eyes, keeping us inside the city and its mephitic atmosphere until the beach appeared free of obstacles and we breathed freely the brackish emanations of the sea, whose small waves crumpled in the sand. What a beautiful day!

Again the train moved away from the beach, and again the smoky buildings, the blackened chimneys, the steam, the piles of old iron, and the multitude of broken-down wagons returned us to the city for a moment. Then the train approached the sea again, as a lover approaches his girlfriend after a brief quarrel, and the locomotive greeted the view of the immense blue expanse with a joyful whistle.

Then we passed the Besòs, whose strip of white sand stretched reddened by humidity, extending in the distance between two thick fences of poplars and reeds. The reed beds were ruffled by the passing of the train and wrapped us in their harmonious murmur.

All the elements can be found in the detailed description: the Exhibition, the factories, the gasometers, the bullring, the Estación de Francia, the beach, the Besòs, and the symbol of modernity, the railway.

Barcelona had its best architects design gas streetlamps. In many parts of the old quarters and the suburbs, these streetlamps, converted into electric lighting,

187. Rahola, Frederic (1888): «Una excursión a Alella». *La Vanguardia*, July 21, 1888.

are still in use today. This respect for tradition and for the image of the city has maintained a certain air in its streets over the years. The *Catàleg del Patrimoni Arquitectònic de Barcelona* (Architectural Heritage Catalogue of Barcelona), with good reason, extended its protection to various types of the old gas streetlamps.

One of the designers was Antoni Gaudí, who was the winner of a competition organized by the City Council to renovate the gas streetlamps in Plaza Reial in Barcelona. The design dates from June of 1878, the same year he finished his studies in architecture. Gaudí made an extensive descriptive report, a watercolor drawing and a plaster model, and presented two alternatives for lighting the square, one with four lanterns, and another with two, which was the solution finally chosen. They are six-armed lamps, cast in bronze and with wrought iron elements on a stone base. On the upper part they bear the caduceus, symbol of Mercury, god of commerce, composed of the winged helmet and two serpents coiled in the central arm. They were inaugurated in September 1879.

A few years later, in 1889, Gaudí received a new commission from the City Council to design some street lamps for the Pla de Palau. The project was based on the ones in Plaza Reial, as the artist wanted to develop similar streetlamps, but not the same ones. Instead of six arms, they have three, but keep the design of the base, the shaft and the arms, while the crowning changes, as the caduceus disappears. Again, the project was designed for four street lamps, but two were installed and inaugurated in 1890. They can now be seen in front of the former building of the Gobierno Civil.

Another well-known architect who designed gas streetlamps was Pere Falqués, who collaborated on the Universal Exhibition of 1888 before being appointed municipal architect of Barcelona (1889-1914). Pere Falqués was commissioned to design the gas streetlamps for the access to the Exhibition, today the Paseo de Lluís Companys. The project is eclectic in style, with a certain monumentalism, and which gave rise to the use of the streetlamp bench, which he later used in another style on the Paseo de Gràcia. The bench is made of stone and supports a grooved shaft, also made of stone, whose iron capital supports the streetlamps, also made of the latter material, forming a spectacular angle.

Years later, when he was a municipal architect, Falqués designed the streetlamp banks on the Paseo de Gràcia, in a clear modernist style, which have often been mistakenly attributed to Gaudí. The iron-forging artist was Manuel Ballarin. The design was implemented with the development of the avenue, and responds to the double combination of a bench for resting and a streetlamp for lighting. It is a

clear example *avant la lettre* of street furnishings. The set consists of 32 benches made with the well-known modernist *trencadís*¹⁸⁸, which gives them an unmistakable air. The cast iron streetlamps, which rise from the bench, bear abundant references to vegetable elements and the characteristic shapes in *coup de fouet*. The bench streetlights initially received much criticism, but over time they have given unquestionable personality to the avenue, and are one of the few elements of the original design that have remained true to their origin.

When the new municipal architects of Barcelona, Florensa and Vilaseca, carried out the first urbanization of the intersection of the Diagonal with the Paseo de Gràcia in 1915, they proposed installing a central obelisk, which would be a tribute to Pi i Margall, president of the First Republic and four large gas streetlamps, which led to the enclave popularly known as the *cinc d'oros*.¹⁸⁹ Political circumstances meant that the monument could not be inaugurated until 1934. After the Civil War it was changed to a monument to Victory, Franco's needless to say, and the streetlamps were removed. Later, in 1984, they were installed in the new urbanization of the Avinguda Gaudí, between the Sagrada Família and the Hospital de Sant Pau, where they continue to stand today. The streetlamps, designed by Pere Falqués and cast by Manuel Ballarín and Alfons Juyol, consist of a base of Figueres stone and pilaster, and are finished with a filigree of wrought iron that supports the four light globes and embraces the stone structure.

A very particular streetlamp is the one located on the upper section of the Rambla, between Plaza de Catalunya and Calle Tallers, an area with a lot of history as well as a vibrant present. The model combines a streetlamp, initially lit by gas, with a water fountain; this type of urban furnishing with a double utility was installed quite frequently in the last third of the 19th century in different areas of the city, taking advantage of its dual function. Such streetlamps were installed in the Rambla de Canaletas, in the squares of Sant Josep Oriol, la Barceloneta, Blasco de Garay, Trilla and Virreina, and on the Riera de Sant Miquel and the Ronda de Sant Pau.

On its lower section there are four cups located on ground level, which collect the water and drain it; in the middle section there is a truly original inverse conical

188. The modernist *trencadís* is a mosaic composed of small ceramic pieces of irregular shapes used with profusion by the primary Catalan architects of modernism, such as Gaudí.

189. The *cinc d'oros* is the Catalan name for the number 5 of *oros* (literally "golds" referring to gold coins) in the Spanish deck of cards, which, because of its image of a central point with four points on the corners, recalled the layout of the monument and the gas streetlamps at this spot.

shape, where the four taps that act as fountains are located, and crowning the fountain is the trunk of the streetlamp, which supports four arms, each of them with a lamp. The whole set is made of wrought iron, with a very elaborate design.

When Barcelona was enclosed by its city walls, in this final part of the Rambla, located in the wall itself was the building of the Estudio General, preceding what was later called the Universidad, and in this Estudio there was a fountain in which some small channels poured water into a kind of watering hole, hence the name of *font de Canaletes*, the fountain of channels. After the walls were demolished in the 19th century, a more modern fountain was installed, whose water came from the Montcada mine, renowned for the quality of its water, which made it famous and helped to create the legend that whoever drank water from this fountain would always return to Barcelona.

However, the great popularity of this fountain-lamp is perhaps due to the fact that it is the meeting point for fans of the Futbol Club Barcelona, the well-known Barça, who celebrate their victories here in great numbers, attracting a huge turnout of fans. This tradition seems to date back to the 1930s, when fans came to the area to learn about the results of their team, which were written on a blackboard in the offices of the newspaper *La Rambla*, located in front of the fountain and visible to the crowds. The Canaletes-style fountain-lamp model is also part of the *Catàleg del Patrimoni Arquitectònic de Barcelona* (Architectural Heritage Catalogue of Barcelona), and is another feature of the intense relationship of gas with the city.

General Manager José Mansana Terrés

José Mansana Terrés, who succeeded his father as general manager, was a highly educated person with great connections in the world of business, finance and culture. Apart from his initial profile, two examples of his activities in business areas other than gas are presented below: the Electroquímica de Flix and the Banca Arnús.

The Figure of Mansana Terrés (1892)

Sometimes a change of people is necessary for situations to evolve in a creative way. Regarding the Sociedad Catalana para el Alumbrado por Gas, the general manager, José Mansana Dordán, had been responsible for executive actions since 1877 and had directed the company and helped it grow until his death in

1892. During his tenure, the long, ongoing confrontation with the Lebon company in Barcelona had not been resolved, and it would still be many years before competition emerged from large-scale electricity production.

He was succeeded by his son José Mansana Terrés (1857-1934)¹⁹⁰, who was appointed general manager of the Sociedad Catalana in 1892 and who held the post until 1934, a long period of 42 years. Newspapers published news items such as the following: “As a personal reward and to honor the memory of the former manager of the Sociedad Catalana para el Alumbrado por Gas, Mr. José Mansana Dordán, the Board of Directors of the same company has agreed to appoint his son, Mr. José Mansana Terrés, to the position that he left vacant”.¹⁹¹ It might seem that Mansana Terrés replaced his father only because of his family connection, but nothing could be further from the truth, his profile was very different: his was incredibly well-prepared and educated for the time, he was both an industrial engineer (1889) and a lawyer with degrees from the Universidad de Barcelona, and had worked for years in the company.¹⁹²

The management of Mansana Terrés was full of events, but special note should perhaps be made of the fact that he was the person in charge of gas in Barcelona who had to face the arrival of gas’ great competitor, electricity, first thermal, then hydraulic, competition introduced and supported by the large multinationals in the sector, companies and groups of an unprecedented technological and financial strength. In addition, Mansana Terrés during his term of office had to resolve the dispute over the gas industry in Barcelona, which was divided and marked by fierce competition.

The updating of the company’s statutes in 1906, with the creation of a new Board of Directors, and the involvement of well-known, prominent figures in the company such as Francesc Cambó, Eusebio Bertrand and Horacio Echevarrieta would also be the work of Mansana Terrés. He also dealt with the confrontation with Barcelona Traction and the Sociedad Catalana’s entry into hydroelectric activity.

190. Fàbregas (2006), pp. 220-226; Fàbregas (2012b), p. 123; Fàbregas (2014d), pp. 1-10; Fàbregas (2014e), pp. 1-10.

191. *La Vanguardia*, May 6, 1892.

192. According to the company’s records, José Mansana Terrés on July 1, 1890 “was appointed Assistant to the General Manager. Substitute in cases of illness and absence”, with a monthly pay of 500 pesetas. Later, in April 1892: “In place of his father Dn. José Mansana Dordán, who passed away on the 23rd of this month, the Board of Directors in a session on the 29th, agreed to appoint him as General Manager with the annual pay of Ptas. 12,500”, and finally in July 1906 he was appointed Managing Director of the company. PFHA, SCAG. *Libro Registro de los Empleados de la Sociedad Catalana para el Alumbrado por Gas*, started on January 1, 1890, p. 162.

Mansana Terrés was a figure who had a huge impact on business and society, both for his constant activities with the Sociedad Catalana, as well as for being, at different times, president of the Mutua General de Seguros¹⁹³, of the Sociedad Electroquímica de Flix, and of the Sociedad Catalana General de Crédito; also for his positions on the boards of the Banca Arnús, the Sociedad Española de Carburos Metálicos, Fodina, and the Editorial Muntañola.

His presence in civil society was evident in many areas: he held the presidency of the Círculo Ecuestre and the Sociedad de Propietarios del Liceo de Barcelona; he acted on the Commissions for the creation of the Caja de Pensiones, now known as CaixaBank, and in the Sociedad Económica Barcelonesa de Amigos del País; he supported culture by helping his friend Isaac Albéniz premiere his opera *Henry Clifford*; he created the foremost collection of Japanese art in Spain, continuing the work initiated by his father with the acquisition of new and important pieces.¹⁹⁴ In short, a businessman with drive, cultural concerns and involvement in the society in which he lived, a person of whom an art critic would say in 1927: “A gentleman [...] who immediately demonstrates that his life has held more than stock prices, the coal market and the price of freight”.¹⁹⁵

Mansana and the Electroquímica de Flix (1897)

Although without a clear, direct relationship to the introduction of electricity in Barcelona, when the Sociedad Electroquímica de Flix was set up in Barcelona on June 2, 1897, Mansana Terrés was appointed its first chairman. The company was created with capital of 4 million pesetas, with a corporate purpose aimed at obtaining chemical products, especially calcium chloride and other chlorine and caustic soda derivatives.¹⁹⁶

The method for the manufacture of caustic soda was a new process based on chlor-alkali electrolysis developed by Chemiske Fabrik in Griesheim, Frankfurt. The installation in Flix was the third to use it worldwide. S. Schuckert & Co., later known as Elektrizitäts AG, was a partner in the electricity sector from the outset. The

193. Fàbregas (2007), dedicated to the first one hundred years of activity of the Mutua General de Seguros, now Mutua Universal, presenting the intervention of José Mansana in its constitution, first years, and in the period of his presidency. The Mutua General was one of the first insurers' in Spain created to cover the needs caused by accidents at work, and its first major customer was the Sociedad Catalana para el Alumbrado por Gas, in order to protect its employees and workers.

194. Bru (2004), p. 248.

195. Soldevila (1927), p. 82.

196. Muñoz (1997), pp. 17-20.

associated power plant was designed for an output of 3,140 kilowatts. In order to situate it properly, its size can be compared with that of the plants of Barcelona's Paralelo (3,750 kilowatts) and Vilanova (2,420 kilowatts). A bank in Basel (Switzerland), Ehinger & Co, was chosen as the financial partner.

All but two members of the Board of Directors of the company were German, the Count of Romanones and Mansana Terrés, who would be the chairman of the company for 37 years, until his death in 1934. Mansana's relationship with Schuckert came from the choice of this technology for the Vilanova plant; Schuckert was later taken over by Siemens, and renamed Siemens Schuckert.

In spite of these relations, it does not seem that Mansana's rectitude was affected, as can be deduced from the following paragraph of a letter from Siemens Schuckert: "Our Schuckert factory also supplied all the machinery for the first part of the construction of the Catalan electricity plant and despite the good result obtained, we have observed in respect to our materials that in recent times they have almost completely dispensed with us, since they hardly ask us for offers".¹⁹⁷

Mansana and the Banca Arnús (1910)

The years that had passed had established the figure, relationships and social importance of the managing director José Mansana Terrés, involved in countless industrial and financial projects and in significant activities of civil society. But perhaps in order to situate José Mansana, his contacts and his position, nothing would be more apt than his relationship with the Banca Arnús, which offers us a glimpse into how different figures of the Barcelona bourgeoisie were related at the time.

Evaristo Arnús was an important banker from Barcelona who in his will had left the bank to his nephew Manuel Arnús, due to his son Emilio's lack of interest, but on the condition that when his grandson Gonzalo came of age he would have the right to ask to join the management of the company. When he reached the age of majority (1908), Gonzalo Arnús asked for his right, but his uncle (Manuel Arnús Ferrer) and his grandfather's attorney-in-fact (José Garí Cañas) did not allow him to exercise it, and they took the business to another banking house created ad hoc, called S.A. Arnús-Garí.

197. NFHA.CCE. *Letter from Siemens-Schuckert-Industria Eléctrica, S.A. to Eusebio Bertrand (30-04-1912)*. At that time Eusebio Bertrand was a director with Mansana in the Sociedad General de Fuerzas Hidro-Eléctricas, but he had not yet joined Catalana de Gas y Electricidad, S.A., the letter basically seeks to be present in the orders made on the Seira-Barcelona transportation route.

Francesc Cambó, a well-known lawyer with an incipient political personality, had been one of the founders of the Lliga Regionalista, a councilor of the Barcelona City Council and a representative of parliament, although after the *Semana Trágica* (Tragic Week) he was not now in one of his finer moments, but he was a friend of Gonzalo Arnús i Pallós. Francesc Cabana explains: “It was at this moment that Francisco Cambó intervened. He convinced his friend, and now client, to set up his own bank. Gonzalo Arnús had the premises of the bank, but he had neither the experience nor the necessary capital, nor — possibly — the capacity of his grandfather. Cambó took charge of finding the money and banking professionals. To his great surprise, the Catalan bourgeoisie to whom he turned showed no interest in participating in the creation of a new bank. The lawyer, who was aware of the state of decline of the Catalan banks, was forced to pass the offer on to a French financial group, Perier et Compagnie, which established a majority stake in the company, which was created in 1910 under the name of Banca Arnús, S.A.”¹⁹⁸

In the end, the shareholders of Banca Arnús consisted of Perier et Cie. (85%) and Gonzalo Arnús (15%). The Board of Directors was chaired by Henri Bauer, managing director of Perier et Cie. Gonzalo Arnús was vice-president, and the board members were Francesc Cambó, the cotton industrialist Alfred Mata Juliá and José Mansana.¹⁹⁹ With this operation, Mansana apart from helping his old acquaintance Gonzalo Arnús, with whom he had coincided in the Junta del Círculo Ecuéstre of 1904, would become familiar with a French bank that we will meet again in the negotiations between the Compagnie Générale d’Electricité and Catalana de Gas, and he also publicly coincided for the first time with Francesc Cambó, later on, advisor to Catalana de Gas y Electricidad, and to Alfred Mata Juliá, who was the brother-in-law of Eusebio Bertrand Serra, another of the founders of the Lliga Regionalista and the person who contributed the concessions of the waterfalls to Catalana de Gas and who later was its chairman for many years. Cambó left the Board in 1918 when he was appointed Minister of Public Works, and both Mansana and Mata resigned the following year. The Banca Arnús finally disappeared in 1947, absorbed by the Banco Central.

José Mansana’s relationship with the Arnús family was not limited to what has been mentioned so far. The same year that the Banca Arnús was set up in 1910, Mansana bought the family house on Paseo de Gràcia in Barcelona, built by Elias

198. Cabana (2001), p. 58.

199. Cabana (1972), p. 140

Rogent, from the Arnús family. The new owner commissioned the architect Josep Domènech Estapà to undertake the building's restoration and adaptation; the building was enlarged with the addition of two towers and spaces were adapted for the Mansana family's Japanese art collection. It would remain in the family until 1944.²⁰⁰

Catalana and Lebon: Headquarters and Harmony

The Period of Building Headquarters (1892-1896)

At the beginning of the last decade of the 19th century, Barcelona's two gas companies, the Sociedad Catalana and Lebon, had reached their maturity and for different reasons decided to undertake the construction of new headquarters that would reflect the quality of the institutions through their architectural presence. The two buildings, which were very important at the time, still exist today and are listed in the *Catàleg de Patrimoni Arquitectònic de Barcelona*, thus maintaining the contribution of the two companies to the city's heritage.

During its first 50 years of operation, the Sociedad Catalana did not have a headquarters of its own. It had gone about changing offices, with great prudence, and after much discussion within the Board of Directors on the need or excess of renting additional square meters to meet the increase in the volume of business operations. At that time it had offices in the building of the Banco de Barcelona at the end of the Rambla.

The situation changed when the General Shareholders' Meeting of April 29, 1891 authorized "the purchase of a house or the acquisition of land and the construction of a building to serve as the company's headquarters". The change of manager accelerated the process: in 1892, a 1,892 square meter plot of land was acquired in the Plaza de Santa Ana in Barcelona. The price was 600,000 pesetas.²⁰¹ The project was entrusted to the well-known architect Josep Domènech Estapà and work began on it and was carried out between 1893 and 1895.

Jospe Domènech Estapà (1858-1917) was an architect characterized by his seriousness, in the modernist style, but with very characteristic personal elements in his creations. Among his works in Barcelona are the buildings of the Real

200. Fàbregas (2006), p. 225; *La Vanguardia*, November 3, 1996.

201. Bragulat (1991), pp. 1-14.

Academia de Ciencias y Artes, the Palacio de Justicia, the Modelo prison, the Palacio Montaner, the Hospital Clínico, the Observatorio Fabra, etc.

The beginning of the construction of the new building aroused the curiosity of the press of the time, which announced: "In the hall where the convent of Montsió had been, on the Plaza de Santa Ana, the foundations are being laid to construct a building owned by the Sociedad Catalana de Alumbrado por Gas, in which it will establish its offices that are currently in the building of the Banco de Barcelona".²⁰²

The original building was located on the Plaza de Santa Ana, now Avenida del Portal de l'Àngel 22, later connected to number 20 of the same street, Calle Montsió 3 (site of the former convent of the nuns of Montsió) and the Pasaje del Patriarca 3.

The façade presented the monumental tendency typical of Domènech Estapà, with a painstaking care for details, semicircular arches over the openings, geometrical vegetal ornamentation, etc., and provided a solid solution to the geometry of the site that required a main façade that was not straight, but diagonal, and a rear façade no higher than one floor, due to the existing easements.

The majestic entrance to the vestibule gave way to a space divided into two corridors separated by two speckled marble columns. Once past the second gallery, the staircase leading to the first floor began in a space illuminated by the zenithal light of a large skylight. The staircase was removed in a 1930s construction to improve the functionality and space of the operating courtyard.

On the ground floor were the services (customer service, reading, collection, etc.); on the first floor were the office of the general manager, the Board of Directors and Supervision (later the Board of Directors), and the company's management, while on the second floor were the Meeting Hall, where the General Shareholders' Meetings were held, and other services. The basements housed the warehouses and tanks, as well as the archives, and also the gas engine that provided heating in winter and air renewal in summer.

The headquarters of the Sociedad Catalana para el Alumbrado por Gas moved into the building in 1895, and remained there for more than 100 years, until 2006, when the company occupied a new building in the Barceloneta. The building entered the catalogue of Barcelona's architectural heritage only two years after its inauguration, and has since been included in the bibliography of the city's important architecture. It cost 225,431 pesetas.

202. *La Vanguardia*, March 6, 1893.

The solid and discreet spirit of the Sociedad Catalana also manifested itself upon building its headquarters. First, it took 50 prudent years to do so, but when it did, it approached it as an architectural contribution to the city it served and chose an architect and a style consistent with its identity and its spirit of integration with and service to its surroundings. Then prudence returned, and it would take another 100 years to change buildings.

The Board of Directors explained this to the General Shareholders' Meeting, which was held for the first time in the new headquarters on April 15, 1896, with the following words: "After 53 years of existence during which more than once the struggle for survival had to be sustained with great energy, this company has reached a state similar to that of those individuals who have dedicated a long life of uninterrupted work to creating a situation, a legitimate reward for their continuous efforts".

During these same years, Lebon also felt it should build a headquarters in Barcelona. At that time, Lebon was a French company, important in the gas sector in the international context, which had built gasworks in France, Spain, Algeria and Egypt. However, its main operation was in Barcelona, and for this reason, when it planned to build an office building in the city, it designed it to be its headquarters in Spain.

The building is located at the Calle Balmes 17 and 19, and was designed by the architect Francisco de Paula Villar Carmona. Built between 1894-1896, it has an eclectic monumentalist style with Nordic influences, and has an unbeatable location, located on a corner bordering the gardens of the Universidad de Barcelona, Calle Balmes and Gran Via. However, its location at one end of the double block dominated by the classical building of the Universidad de Barcelona made it necessary to look for architectural solutions; the alignment of the building in its context had to be achieved by simulating the main façade on Gran Via while the access was via Calle Balmes. The construction was carried out with stone from Montjuïc and exposed brick, and its corners were decorated with four towers. Later, a top floor with mansards was added.

When the building was sold to Catalana de Gas in 1923, the Lebon company described it in the following words:

This house is intended to house the management, offices, workshop and warehouse, corresponding to the services of the lighting gas industry that Messrs. Lebon & Co operate in Barcelona and its surrounding area...

The plot corresponding to the house occupies a surface area of about 1,132.93 square meters (29,986.65 square palms). The part of this area built at full height covers about 774.50 m², the rest of the plot being occupied by an existing courtyard to the NE of the building and a wide passage space that runs along the SE and SW facades of the house...

The building consists of: A semi-basement, housing a workshop, warehouses, notice and complaint offices and a concierge's room. From a mezzanine floor, intended entirely for the offices of Messrs. Lebon & Co. in Barcelona...

A main floor, part of which is intended for the offices of Messrs. Lebon & Co. and another for the Mr. Director-Manager's room...

Of two first and two second rented floors...

Around the existing rooftop terrace at the top of the building, surrounding the central courtyard of the building, there are several rooms in which the laundry rooms corresponding to the apartments of Mr. Director and tenants, and the old documentation archive of the Lebon Company...

At the four principal corners of the house there are four towers, topped by a small roof terrace with a lightning rod in its center, and surrounded by a zinc crest.²⁰³

The building is currently owned and occupied by the head office of Mutua Universal, one of Spain's leading industrial accident insurers.²⁰⁴

The La Catalana-Lebon Agreements (1895)

Mansana Terrés inherited a situation in which the company owned gasworks in Barcelona, Seville and Ferrol. However, while the gas situation was more or less calm in Seville and Ferrol, in Barcelona the extreme rivalry with the Compagnie Centrale E. Lebon truly hindered progress. This situation stemmed from the confrontation that began in 1849 when José Gil displaced Charles Lebon from the management of the Sociedad Catalana, and reached its peak in 1864 when Lebon, with the help or approval of the City Council, managed to take the public lighting contract of Barcelona away from the local company.

The change of interlocutors produced by the replacement of Charles Lebon by his son Eugène in the management of the Lebon company, and that of José Gil, at his death in 1877, by José Mansana Dordán, had not softened the fight for markets.

203. Lebon et Cie. (1923), pp. 152-154.

204. Fàbregas (2007), pp. 118-124.

However, signs of a new era were approaching; indeed, the Municipal Law of 1877 forbade local councils from granting a monopoly for lighting²⁰⁵, which was an important change, as this had not been a significant problem until now.

At the end of the century, with the progressive advance of electricity, a new scenario arose in which electricity could either be seen as a major enemy or, on the contrary, as a major business opportunity, but in either case would require large capital, creating new competitors. Under these conditions, collaboration between contenders was seen as an appropriate strategy, and so, when Mansana Dordán died in 1892, and was replaced by his son Mansana Terrés as manager of the Sociedad Catalana, and Alfred Lebon now led the next generation of the Lebon company, the elements for a possible agreement appeared.

In Barcelona, the Sociedad Catalana owned the Barceloneta and Sant Andreu gasworks, while Lebon owned the Sant Martí, Gràcia and El Arenal gasworks. The latter generated income as Gas Municipal and was linked to the city's public lighting contract which expired in 1895, and which in one of its clauses established that the City Council had the option of keeping the gasworks on that date, so its ultimate ownership was not clear.

Matters moved forward in 1893 when Lebon managed to get the City Council to renounce the possibility of seizing the gasworks at the end of the contract. So Lebon definitively took over Gas Municipal, its facilities, rights and obligations, and began to invoice as E. Lebon y Cía., now as owner of all the gasworks. The company could thus develop its future strategy from a more relaxed perspective. The talks with Mansana immediately attempted to put an end to the confrontations in Barcelona. Mansana had been authorized by the Board of Directors of the Sociedad Catalana to start negotiations with the Lebon company, to agree to "all those agreements that aim to avoid the damage caused by competition".²⁰⁶

The opportunity came on February 28, 1895, when the Barcelona City Council declared the Lebon company's contract expired, but in an auction it again awarded it the city's public lighting service. In a few weeks, specifically on May 27, La Catalana and the Lebon company, represented by Mansana and Alfred Lebon, reached an agreement to end their confrontations and to begin to collaborate, signing the appropriate agreement, which in its first article commented on the

205. "...it is understood that the City Council will not be able to grant any monopoly or privilege for those services...".
Municipal Law of October 2, 1877 (*Gaceta de Madrid*, October 4, 1877). Fernández-Paradas (2016), pp. 51-52.

206. NFHA.SCAG. *Junta Directiva* (25-10-1893).

award of the contract to Lebon, and indicated that according to those agreements the Lebon company “is the only company commissioned [by the City Council] to manufacture the gas for the aforementioned service”, adding: “But this service will be provided on the account of and in equal measure by these two companies under the conditions stipulated in the following articles”.²⁰⁷ In short, Lebon and La Catalana each shared half of the city’s public lighting.

A little later, on June 24th, another agreement was signed, this one referring to private lighting. The gist of the agreements was as follows: “The Compañía Catalana and the Compañía Central commit themselves in the most formal manner in the present agreement not to make any sacrifice, not to offer any advantage in favor of subscribers, that is, that the rights of branches and transfers, the value of the branches and installations, etc. will be borne by the subscribers without the Compañía Catalana or the Compañía Central taking the slightest action on their own. No free lighter will be given and no discount will be given except for those that have been consented to until today and those that are made by mutual agreement”. The agreement was to last until December 31, 1899.

The same agreement established how the revenue from gas sales to private consumers would be distributed from 1894 onwards. It was to be distributed according to the sales of 1893, plus the proportion of 72% for La Catalana and 28% for Lebon of the increases in subsequent years, making the necessary adjustments and compensations to reach these figures. The agreement referred to the figures for Barcelona, Sants and Gràcia. In short, by mid-1895 competition between the Barcelona gas companies had ceased.

207. NFHA, SCAG. *Comisión Mixta con Lebon (20-05-1895)*.

1890-1910

The Central Catalana de
Electricidad and Thermal
Electricity

Electric light would become the great competitor of gaslight, but for many years it was not present outside of laboratory experiments, or demonstration facilities with electric arc bulbs, with their serious problems, both in terms of cost and the need for constant human manipulation and the significant pollution they generated in enclosed spaces. Electricity was first produced in thermal power stations using coal as a raw material, marking an entire era, until the appearance of hydroelectric electricity in the 20th century.

Edison and *The Sun* of New York in 1878

For the diffusion of electric light it was necessary to resolve two issues. First, lamps that were small, cheap and capable of lasting for many hours; and second, a difficulty usually overlooked: how to obtain an efficient subdivision of the electrical energy, that is to say, for several lamps of any size to be operated jointly in the same circuit.²⁰⁸ Both problems were solved by Edison in a practical way in 1879-1880.

But the revolution reached the markets earlier than the inventions themselves. The simple news that Edison was working in the field of the subdivision of electric light and its distribution possibilities as well as on lamps, and the constant diffusion of his activities and opinions in the pages of the New York newspaper, *The Sun*, produced a serious upheaval in the financial markets.

In particular, Edison's statements on November 15, 1878, in which he stated that: "I am now certain that electricity will be cheaper than gaslight"²⁰⁹ and explained his experiments, caused his company's shares to rise rapidly on Wall Street, while the shares of gas companies collapsed, and an abnormal market situation occurred.²¹⁰

Only 24 hours after Edison's first announcement, the Sociedad Catalana, always alert to business opportunities in Spain and to technological progress at an international level, requested information from the Association of Engineers of New York, through its technical manager, Claudio Gil, who asked for an evaluation

208. Edison explained this in his patent for the incandescent lamp on January 27, 1880 (US Patent 223.898): "The object of this invention is to produce electric lamps that emit light by incandescence, lamps that must have a high resistance, to allow the practical subdivision of electric light."

209. "Edison in good spirit and positive on complete success". *The Sun*, November 15, 1878.

210. "What Mr. Edison thinks of the recent English invention?". *The Sun*, November 25, 1878.

of the situation. The response of the New York engineers on December 2 removed any urgency from the matter and indicated that Edison had not yet invented anything concrete in this area and that the distribution of electricity still had many problems to overcome. They explained that “the alarm has been mainly a stock market maneuver and that despite all the hype, few shares have actually changed hands”. Although they also clearly recommended, with a view to the future, that: “... the engineers of the companies should be in a position to be able to supply electricity if necessary”.²¹¹

The Sociedad Catalana’s surprising speed of reaction to movements in environments far from its centers of activity is remarkable, and even more so considering that this occurred in far off 1878. Later, progress in the field of electricity accelerated in an extraordinary way, and in a few years the first electricity company in Spain would be established, specifically in Barcelona in 1881, the Sociedad Española de Electricidad. The threat wasn’t that far off.

In the second half of the 19th century, the energy field in the most developed parts of the world was dominated by coal for thermal purposes, while the lighting of cities was ensured by gas, which in turn came from the distillation of coal. In some areas, lighting was fueled by petroleum, but the widespread diffusion and pre-eminence of this energy would not occur until the massive appearance of the automobile sector, or more generally, of modern transportation. Also, in less developed areas, thermal issues were solved using firewood and wastes. Hydropower was only used to run mills of one kind or another and thus improve the efficiency of agricultural work. Electricity and natural gas, two energies that together with petroleum marked the 20th century, had yet to be introduced.²¹²

Electricity is not an energy in the strict sense, it is an energy vector, that is to say, it does not exist directly in nature, but must be produced and this brings creativity and flexibility to its production, notably in conventional thermal power stations, hydraulic power stations, nuclear power stations or natural gas combined cycle plants. In many cases, the introduction of renewable energies also involves their transformation into electricity.

However, in order for electricity to be introduced during the last quarter of the 19th century, answers to some important questions had to be found, such as:

211. NFHA.SCAG. *Junta Directiva* (04-01-1879).

212. Fàbregas (2012g), pp. 5-6.

- **What electricity could be used for.** For mass use: the first use was lighting, but it was necessary to develop lights that could be used worldwide, which meant achieving higher durability and lower cost. In short, to be able to use Edison's incandescent light bulbs.
- **How to produce it on a massive scale.** In this respect, the advances made by the Gramme dynamo, the first power stations such as Schuckert in Bavaria, or Edison in New York, known as the Pearl Street Station, were necessary to solve the problems of subdividing electricity.
- **Who would introduce it and how.** Companies were the indispensable instruments without which the rapid diffusion of innovation was simply impossible, but business models, the design of organizations, and how to obtain the necessary funding had to be defined. Providing the world with a necessary but as of yet non-existent global infrastructure was neither a quick nor easy job. Building the necessary important infrastructures on a massive scale, at high speed, in different areas of a country and all at the same time, in all the developed countries of the western world, posed an unprecedented challenge.

All these problems were overcome, in the beginning, by American and German companies, with great interrelation between them and subject to a progressive phenomenon of verticalization and interested relationship.

Usually, the initial business models passed through a stage of inventors or product developers, who managed to attract banks or financial market companies, creating companies that initially produced the electrical material and at the same time entered into the sale of this material to citizens and industries, supporting the production and supply of electricity, with machines designed, built and supplied by the same firms.

In the early decades, electricity was produced from coal, or in some cases, gas produced from coal, and no thought was given to its transport over long distances; the current generated was direct current. Initially, until the development of electricity uses in industry provided more options for its management, supplying tramway companies was used to moderate differences in the daily load curve existing in the use of electricity for lighting.

Historians of Deutsche Bank described the era of great change and great opportunity as follows: "The telegraph and, to a greater extent, the telephone revolutionized communications, giving rise to a new branch of industry dedicated to

the manufacture of cables, insulators, instruments and household appliances. The large-scale acquisition of raw materials and production of goods became necessary only after it was possible to exploit for practical purposes not only the weak current used for telegraphy, but also direct current technology”, adding: “This sudden emergence of rapid growth and the enormous capital requirements made it virtually impossible for companies to expand on their own. Therefore, banks soon became crucially involved in the construction and expansion of the electricity industry”.²¹³

American and German companies essentially introduced electricity into the Western world. The former, with greater support from the financial markets, and the latter, with greater participation from the banks, but with a significant number of interrelations existing between all these players.

Pioneering Electricity Companies

The initiative was taken by American companies, usually centered on one or more inventors capable of attracting financial capital and creating companies to produce and market their products; subsidiaries or related companies were soon established in Europe and other countries.²¹⁴

Edison General Electric Co. (1889)

Electrical phenomena had been known since time immemorial, but the transcendent moment for this history took place when Thomas Alva Edison managed to perfect the so-called incandescent lamp by extending its life span through the use of a carbon filament with different variants.²¹⁵

Edison’s invention made electric light usable, both because of the constant improvements he introduced as an inventor with hundreds of registered patents to his name, and because of his impressive entrepreneurial capabilities, which allowed him to create companies that would take his inventions to the market and to consumers.

213. Gall (1995), p. 32.

214. Fàbregas (2012g), pp. 6-7.

215. Fàbregas (2012h), pp. 46-47.

It was a spectacular dynamic. Edison first created a partnership to secure funding for his inventions, the Edison Electric Light Co. (1878); then he invented his incandescent lamp (1879), which lasted 40 hours; the following year, when he made one that lasted 600 hours using a carbonized bamboo filament, he started a light bulb factory, the Edison Lamp Co. (1880), and also a factory for dynamos and large electric motors, the Edison Machine Works (1881), which eventually merged to create the Edison General Electric Co. (1889).

The other line of activity, not the production of electrical or electro-technical equipment, but the production and distribution of electricity, the public utility, the transformation of electricity into a commodity, was started up with the Edison Electric Illuminating Co. of New York (1880), and its Pearl Street Station, the first power station in the United States, capable of lighting 800 electric lamps at the time of its commissioning.

To close the exhibition, he presented at the first International Electricity Exhibition (1881), held in Paris, a dynamo directly coupled to a steam engine that powered 1,200 lamps. He immediately started to set up companies to exploit his inventions in different countries, such as Germany, Italy, France, the United Kingdom, Canada, Argentina, Japan, etc.²¹⁶

General Electric (1892)

In addition to Edison, there were other inventors in the United States with financial creativity. Elihu Thomson and Edwin Houston researched arc lamps and dynamos and created American Electric, Co. (1880), which would change its name to Thomson-Houston Electric Co. (1883), and in 1889 acquired the company from the other inventor of the incandescent lamp, Swan, initiating activities in this field. Thomson-Houston also established companies in various countries, such as Germany, the United Kingdom and France.²¹⁷

The integration process began in 1892 with the merger of Edison General Electric Co. and Thomson-Houston Electric Co., which resulted in a world leader for many years in electrical equipment, General Electric Co.

The new company continued the tradition of innovation, making the largest electric locomotives, 90 tons, and the largest transformers, 800 kilowatts (1895),

216. See edison.rutgers.edu [consulted 10-08-2012].

217. See electricmuseum.com [consulted 10-08-2012].

and inventing X-rays (1896). It was the first company in the United States to create a laboratory dedicated exclusively to scientific research within the company (1900).²¹⁸

Allgemeine Elektrizitäts-Gesellschaft (1883)

German companies usually started out as companies related to American companies, such as AEG or UEG, although a model similar to the American one also existed of an inventor or technology expert who energized a new situation, such as Siemens or Schuckert.²¹⁹

A characteristic of the German model used to introduce electricity technology in Europe was to approach growth through the electro-technical company itself, and to create new companies that would buy its products and services in new markets. Companies promoted, financed and managed by the parent company itself, which also supplied the necessary equipment. A German neologism was even created for this activity: *Unternehmergeschäft*.

In markets with great opportunities for development such as those in Europe, the financial demands of this model ended up creating problems of liquidity and risk concentration for the parent company. The solution was to slow down growth, so that competing companies could outperform the company itself or involve other entities in the process. The second option, however, was normally used, such that alongside each major electro-technical company there was a financial company with major participation by banks, usually from different European countries, which allowed the process to continue by multiplying the investment and obtaining a larger overall profit.

AEG was the creation of a German engineer, Emil Rathenau (1838-1915), a member of a family of Jewish merchants established in Berlin, who, with the help of a banking group, obtained the rights to use some of Edison's patents, creating the Deutsch Edison-Gesellschaft für angewandte Elektrizität (1883, DEG) (German Edison Company for Applied Electricity), with a capital of DM 5 million.

In setting up DEG, backing from banks was essential, and four fifths of the capital was secured by the Nationalbank für Deutschland, as well as by Landau & Sulzbach. It should be noted that the traditional German company in the sector,

218. See www.ge.com [consulted 10-08-2012].

219. Fábregas (2012g), pp. 7-10.

Siemens & Halske, founded in 1847, did not participate, nor did the large German bank, Deutsche Bank, which was run by a member of the Siemens family.

However, DEG and Siemens & Halske did reach an agreement whereby Siemens recognized DEG's right to build lighting systems and electric lights using Edison's patents, while DEG ensured that all necessary materials, apparatus and machines not covered by Edison's patents would be acquired from Siemens.²²⁰

Following Edison's model, DEG also began to produce and distribute electricity and created the Berlin-based company, the Städtische Elektrizitäts-Werke AG zu Berlin (1884), where the German electricity industry began.

Within a few years, DEG, which had managed to develop its own technological line, changed its name to Allgemeine Elektrizitäts-Gesellschaft (1887, AEG), by which it would become known as one of Germany's leading companies for many years, developing an aggressive international investment policy.²²¹

There was another reason for the change in DEG: the Berlin power company had not been able to meet its commitments to the City Council, and its financing capacity was not large enough. The change from DEG to AEG was not only in name, but also in the size and type of company. Its capital was increased from DM 5 million to DM 12 million, Siemens & Halske took a DM 1 million stake, and secured with a banking consortium led by Deutsche Bank and Delbrück Leo & Co. the remaining 6 million marks. Relations with Edison, Siemens & Halske and the Berlin power company were also restructured.²²²

Among AEG's many contributions to the industry was the remote transmission of electricity, over a distance of 175 kilometers, from a hydroelectric power station to Frankfurt in 1891. In the case of AEG, the financial company was the Bank für Elektrische Unternehmungen (1895, Elektrobank), set up in Zurich and comprising five German, two Swiss, one French and one Italian banks; notable among these were Schweizerische Kreditanstalt (Crédit Suisse), Deutsche Bank and Berliner Handelsgesellschaft.

In the process of concentration of the German electro-technical industry, an important step was taken when AEG (created in relation to Edison) took over the Union Elektrizitäts-Gesellschaft (created in relation to Thomson-Houston)

220. Gall (1995), p. 33.

221. The AEG created the Compañía Barcelonesa de Electricidad in Barcelona.

222. Gall (1995), p. 34

in 1902. In this way, the financial companies Gesfürel and SOFINA also entered its orbit.²²³

AEG's great competitor at the beginning of the 20th century was Siemens, although there were also times for collaboration, such as the joint foundation of Gesellschaft für drahtlose Telegraphie mbH (1903), known as Telefunken, to develop radio equipment.²²⁴ Over time, AEG was acquired by Daimler-Benz (1985) and definitively disappeared in 1997.

Union Elektrizitäts-Gesellschaft (1892)

The Union Elektrizitäts-Gesellschaft (1892, UEG) was incorporated as a subsidiary of Thomson-Houston Electric Co. of the United States, with the participation of the Berlin-based mechanical engineering company Ludwig Loewe & Co., to operate in Germany and other European countries.

It became one of the leading companies in the construction of electric trams in Germany, thanks to American technology. Among other places, it started up trams in Bremen, Essen, Hamburg, Munich and Berlin.

The Gesellschaft für Elektrische Unternehmungen (1895, Gesfürel) was set up in Brussels to provide financial support for its activities. The shareholders were the Jewish businessman Isidor Loewe, brother of Ludwig Loewe of UEG, together with AEG and several banks, such as Darmstädter Bank, Disconto-Gesellschaft, Dresdner Bank and some private banks.

A few years later, UEG and Gesfürel jointly formed a holding company with a long and important history, the Société financière de Transport et d'Entreprises Industrielles (1898, SOFINA), whose initial purpose was to acquire tramway companies and tramway electrification projects. UEG was ultimately absorbed by AEG in 1902.

Siemens & Halske (1847)

The Siemens company was very old. Its beginnings can be traced back to the Telegraphen Bauanstalt von Siemens & Halske (1847), founded by Werner von Siemens and Johann Georg Halske to focus on telegraph, technology and implementation activities and which built Europe's first long-distance telegraph between Berlin and Frankfurt in 1848.

223. SOFINA would later have relations with Barcelona Traction in Barcelona.

224. See www.telefunken.com [consulted 10-08-2012].

The company soon expanded into other European countries, broadening its activities to include electric trams, dynamos, and finally lights and all types of electrical equipment, and was for many years the rival of AEG.

To develop its activities, it also set up a financial company, called Schweizerische Gesellschaft für Elektrische Industrie (1896, Indelec) and in French Société Suisse d'Industrie Électrique (SSIE), set up in Basel, together with Basler Handelsbank. Indelec financed new hydroelectric power plants in Switzerland and in different countries in Europe and Mexico, and was involved in the initial electrification of large cities such as Paris, St. Petersburg, Moscow, Riga and Baku.

The Telegraphen Bauanstalt von Siemens & Halske was able to lessen its dependence on its financial partner for its electro-technical business by having at its disposal the resources generated by its previous activity in the telegraph sector and by becoming a listed company under the name Siemens & Halske in 1897.

In the process of integrating the German electro-technical industry, Siemens took over Elektrizitäts-Aktiengesellschaft (1903), the former Schuckert. This led to the reorganization of the Siemens Group into two companies: Siemens & Halske, a low-voltage company, and Siemens Schuckertwerkwe GmbH (SSW), a joint venture between Elektrizitäts and S&H's high-voltage, heavy equipment department. This situation would continue until 1966 when SSW would be absorbed into the new Siemens AG.²²⁵

S. Schuckert & Co. (1885)

Sigmund Schuckert (Nuremberg, 1846 - Wiesbaden, 1895) had first worked at Siemens & Halske, and then moved to the United States where he worked with Edison. When he returned to Germany in 1873, he settled in Nuremberg, where he almost immediately began to manufacture dynamos for electricity generation.

When Alexander von Wacker entered the business, a company was established under the name of S. Schuckert & Co. (1885), which was primarily engaged in building and operating power plants and distribution networks supplying electricity to citizens and industrial plants.

Growth made it necessary for the company to be listed on the stock exchange, for it to change its name to Elektrizitäts-Aktiengesellschaft (1893), and to allow a banking consortium to become a major investor in it. Like the other German companies in its business, Schuckert also set up a financial company, Rheinische

225. See www.siemens.com [consulted 10-08-2012].

Schuckert-Gesellschaft für Elektrische Industrie AG (Rheinelektra, 1897), formed by Elektrizitäts AG, together with various banks, such as W. H. Ladenburg & Söhne, Straus & Co., Süddeutsche Bank, and Josef Noether & Co.

At the end of the century, it employed more than 4,000 people (1896) and had built 120 power plants in Europe, (1900)²²⁶, a very significant number that exceeded the sum of its two main competitors (AEG and Siemens & Halske). However, in the consolidation process of the German electro-technical industry it was absorbed by Siemens & Halske (1903).²²⁷

The Origins of Electricity in Spain

In the case of Barcelona and Spain, the first company to build a power plant was the Sociedad Española de Electricidad, promoted by Tomás Josep Dalmau in 1881 in Barcelona, with the dual objective of manufacturing machinery and distributing electricity to its customers, for which it set up an installation on Calle del Cid with 64 hp of power (hp stands for horsepower: 1 metric hp is equivalent to 735.5 watts). Apparently, however, the electricity produced was mostly consumed in the factory itself. It is remarkable that Spain's first power plant was commissioned only a year after Edison's in New York. La Española de Electricidad was the initiator, but it was never very big; in its prime, in 1894, it had 130 electricity customers, while the Sociedad Catalana had 37,452 gas customers with 216,292 lights contracted. Obviously the difference in size was notable. But the situation began to change in 1889 when Woodhouse & Rawson United Ltd. acquired the majority of the shares of the Sociedad Española in order to boost it.

Another important element was the appearance in Spain of AEG in 1889 in Madrid. When it became technologically independent in 1887, AEG decided to launch its first *Unternehmungsgeschäft* project outside Germany, and the place chosen was Spain, specifically Madrid. In 1889, Deutsche Bank²²⁸, set up the Compañía General Madrileña de Electricidad to produce and supply electricity in Madrid, 50% of it with the Compañía Madrileña de Alumbrado y Calefacción por Gas, which was

226. One of these facilities was the Central Vilanova power plant of the Sociedad Catalana in Barcelona in 1897.

227. See www.siemens.com [consulted 10-08-2012].

228. Fàbregas (2012g), pp. 12-13; Loscertales (2005), pp. 13-15; García de la Infanta (2002), pp. 103-112.

French.²²⁹ The Board had two venues: Madrid and Brussels. The first chairman was Segismundo Moret, minister on countless occasions and at the time president of the government (1905-1906).

AEG's interest in placing its machines was reflected in Article 35 of the Articles of Association of the new company: "AEG shall have the preferential right to study the plans and to execute the projects, to draw up the conditions for purchasing the equipment, to regulate the tariffs, to control the work...", however, there was no absolute obligation to purchase the equipment from AEG. La Madrileña enjoyed spectacular growth in its initial years; later, competition progressively appeared, and AEG, having already placed its equipment and facilities, sold its 50% of the company to the Madrid gas company in 1905. La Madrileña continued to produce electricity from the Norte and Mazarredo power plants, with 200 kilometers of networks, and beginning in 1908, managed the assets of The Electricity Supply Co. for Spain Ltd. in Madrid. In 1912 it was one of the companies that formed the Unión Eléctrica Madrileña, which became part of Naturgy in 2009.

The same process was carried out by AEG in Seville in 1894, where the competition in lighting was the Sociedad Catalana, and it established the Compañía Sevillana de Electricidad. Both German banks and Spanish investors, including the Ybarra brothers, were shareholders, although the German group controlled 51% of the shares.²³⁰ In this case, the supply contracts could only be entrusted to AEG. After World War I, the Sevillana de Electricidad lost its German connection, and the Banco de Vizcaya entered its capital and was a stable shareholder for many years. Between 1991 and 1996, ENDESA took control of the company.

The Compañía Barcelonesa de Electricidad

In 1894, AEG installed itself in Seville, it also appeared in Barcelona, where it founded the Compañía Barcelonesa de Electricidad, associated with the Lyonnaise des Eaux et de l'Éclairage, owner of the Sociedad General de Aguas de Barcelona. In Madrid it had partnered with the gas company; in Seville, with private capitalists;

229. Predecesor of Gas Madrid.

230. The German group was made up of AEG (20%), Deutsche Bank (20%), the Berlin trading company (16%), Delbrück, Leo & Co. (14%), Jakob Landau (10%), the National Bank für Deutschland (10%) and Gebrüder Sulzbach (10%).

Table 26. Compañía Barcelonesa de Electricidad. Board of Directors (1894)

Name	Position	Adscripción
Marquis of Robert	Chairman	—
Emil Rathenau	Vice-President	Chairman of AEG
Arthur Gwinner	Appointed Administrator	President of Deutsche Bank
Ramón M. ^a Lobo	Appointed Administrator	Representative of AEG in Madrid
Manuel Arnús	Member of the Board	Banca Arnús
Eugène Bruniquel	Member of the Board	Appointed Administrator of Lyonnaise des Eaux
Eugenio Landau	Member of the Board	Banker
Karl Fürstenberg	Member of the Board	AEG
Eusebio Roquer	Secretary	—
Karl A. Bischoff	Secretary	—

Source: Alayo (2007), p. 755.

and in Barcelona, with the water company, but in no case had it approached the Sociedad Catalana.

AEG's entry into the Barcelona market did not bode well for the city's gas companies, which suddenly saw the appearance of a major competitor, the most important in Europe, and perhaps in the world at the time, with financial resources and available technology, ready to takeover the market (Table 26).

The new company, Compañía Barcelonesa de Electricidad, was incorporated on December 7, 1894 with a share capital of 4 million pesetas. Its main partners were AEG and Deutsche Bank, which subscribed 70%; Société Lyonnaise des Eaux et de l'Éclairage, which subscribed 25%; and banks in Barcelona, which subscribed the remaining 5%.²³¹ Important people, such as the founder of AEG, Emil Rathenau, or the soul of Deutsche Bank, Arthur Gwinner, appeared on the Board. Almost immediately after its incorporation, the financial company of AEG, the previously mentioned Bank für Elektrische Unternehmungen, became a shareholder in 1896 through a capital increase from its headquarters in Switzerland.

The company's business activity began immediately, on December 14, 1894, when it acquired the facilities of the Sociedad Española de Electricidad for 2 million pesetas, and with the signing of a contract with AEG for the construction of a

231. Hertner and Nelles (2004), p. 26, n. 8.

new power plant and a distribution network in Barcelona. The power plant would be known as the Mata plant, or Las Tres Chimeneas (The Three Chimneys), located on the Avenida del Paralelo of the city. It was designed in Berlin, at AEG's headquarters over the year of 1895, and construction began immediately, obviously with AEG machines, until the trial period began in May of 1897. The plant entered commercial operation in 1898, with an installed capacity of 3,750 kilowatts, and supplied customers with 110 volts direct current electricity.

The Central Catalana de Electricidad

The Movements of the Sociedad Catalana

The Sociedad Catalana came to electricity after years of observing and analyzing the evolution of technologies, markets and the movements of potential competitors.²³² It was clear that in the short or long term electricity would fundamentally advance in several areas: public and private lighting and in relation to electric motors.

At the 1891 General Shareholders' Meeting, the Board of Directors considered that the time for electricity had not yet come, or that it was not yet a profitable sector: "It has also been an ongoing concern of this Board, which has examined the matter with the required assiduity and interest, the study of whether it would be convenient for the La Catalana company to extend [sic] its business to the supply of electric lighting and after weighing the advantages that this business could bring us and the damages it could cause us, the opinion has been reached that the present moment does not offer the suitable opportunity for our company to undertake this business, without overlooking that circumstances can change and make opportune what today presents no probability of success, for which reason it intends to keep abreast of all developments in this area and to continue with the studies it so far has made".²³³

It was not until 1893 that competition from electricity was recognized for the first time as affecting the company: "Nowadays, electric light damages our interests by taking consumption away from us, losses that due to special circumstances are not enough to be noticeable in the returns of our business; but it cannot be

232. The Sociedad Catalana kept an eye on Edison as early as 1878. Fàbregas (2012g), pp. 1-105; Fàbregas (2014d), pp. 1-21; Fàbregas (2017b), pp. 52-77.

233. NFHA.SCAG. *Junta General de Accionistas* (29-04-1891).

denied that this kind of lighting nowadays satisfies a need that cannot be neglected and which has a tendency to constant and increased growth".²³⁴

However, in order to be able to develop the new activity when it was deemed appropriate, it was essential to extend the corporate purpose of the Articles of Association, which limited the company to dedicating itself to gas activities. At the General Meeting of 1893 it was agreed to shift from a corporate purpose involving "the manufacture and supply of gas for public and private lighting" to a broader one which included: "... the production and supply of lighting, heating and motive power by gas, electricity or other means".

The pace of things changed when AEG appeared in Barcelona in 1894, bought the Sociedad Española de Electricidad and decided in 1895 to build a new, extraordinarily powerful power plant in Barcelona. Coincidentally or not, this was the same year that the Sociedad Catalana and Lebon settled their disputes in the area of gas in the city, as explained above. From this moment on, within a few months, they joined forces against the common enemy: electricity and the German multinational. The reaction was not to resist as other companies facing this type of situation were doing, but to attack by entering a sector they were unfamiliar with and to do so with significant force. The spirit of an organization manifests itself in difficult times.

The first agreements concerning electricity between the Sociedad Catalana and Lebon were reached in February of 1896, when the Board of Directors and the Board of Supervisors of the Sociedad Catalana and Lebon approved entering the electricity business jointly with Lebon, emphasizing: "... the advantages that the operation of this business in collaboration with Lebon brings us, given that, as well as avoiding a competitor, we gain a friend who will share with us the efforts of the struggle and any economic setbacks that may arise".²³⁵ Once the decision was made, the subsequent movements were made very quickly: the Central Catalana de Electricidad was constituted, which would be the instrument of the Barcelona gas companies to act in the electricity sector.

The Central Catalana de Electricidad (1896)

On March 2, 1896, the Central Catalana de Electricidad was set up with a capital of 6 million pesetas as a joint venture between the Sociedad Catalana para el

234. NFHA.SCAG. *Junta General de Accionistas* (29-04-1893).

235. NFHA.SCAG. *Junta Directiva* (13-02-1896).

Table 27. Barcelona Power Plants (1897)

Power Plant	Paralelo	Vilanova
Owner	Cía. Barcelonesa de Electricidad	Central Catalana de Electricidad
Main shareholders	AEG	Soc. Catalana - Lebon
Power installed	3,750 kW	2,420 kW
Technology	AEG	Schuckert
Incorporation of the company	1894	1896
Start of tests	May 1897	May 1897
Commissioning of the system	1898	1898

Source: Alayo (2007), pp. 150-153 and by the author.

Alumbrado por Gas (50 %) and the Compagnie Centrale E. Lebon et Cie. (50 %). The company's financial involvement was very significant; it should be remembered that the share capital at that time amounted to only 4.1 million pesetas and an additional 3 million had to be paid out. In order to finance this, the company resorted to borrowing, with an issue of bonds at 5% interest. The gamble was a very big one.

Immediately, the new company decided to build a thermal power plant, the Vilanova plant, to generate electricity using coal as a raw material.²³⁶ A plot of land was acquired on Avenida de Vilanova and the building of the plant was commissioned to an important modernist architect, Pere Falqués.

The technological design was entrusted to the Schuckert company in Nuremberg (Germany), in those years already called Elektrizitäts-Aktiengesellschaft, the great technological rival together with Siemens of AEG. The plant was designed for a power output of 2,420 kilowatts, slightly less than that of AEG, specifically 65% that of the Barcelonesa de Electricidad, but still undoubtedly an important amount for the time and the city in which it was located. The project was to supply the city with 150-volt direct current electricity (Table 27).

Despite the Sociedad Catalana's initial delay in deciding to enter the electricity market, the subsequent race against its competition was impressive; the company made up for lost time and the start of the tests and the start up of the two plants coincided in time, which was a clear consequence of the fact that a lot of time had

236. Lozoya (1982), pp. 51-52 and 77-85.

been spent to prepare everything, in anticipation of the right moment for its effective implementation. In fact, at the company's General Shareholders' Meeting on April 29, 1897 explanations were given of what had been done only when everything was already practically ready.

In giving consideration to future developments, barely a month after setting up the Central Catalana de Electricidad, the Sociedad Catalana and Lebon agreed that they would not devote themselves to electricity in the municipalities where the Central Catalana de Electricidad supplied these services.²³⁷ The business of electricity for the two companies went beyond Barcelona, in fact in other municipalities both the Sociedad Catalana and Lebon built thermal power plants without any connection to the Central Catalana de Electricidad.

The architect of the power plant, Pere Falqués, had worked on the 1888 Universal Exhibition with Elías Rogent, and also held the post of municipal architect of Barcelona. His works include the Matadero Central (Central Slaughterhouse), the monument to Rius y Taulet, the monument to Pitarra on La Rambla, the house of the Marquis of Camps, etc., and he was also one of the principal architects who designed the city's gas streetlamps.

The building, designed as clearly modernist, was built on the corner of Avenida Vilanova, number 12, and Calle Roger de Flor, and had a long façade on Avenida Vilanova; stone, exposed brick, iron fittings and glazed ceramics were used in its construction and finishes. The main entrance was located on the corner and had a circular hall with a lot of personality, and a large nave where the equipment to produce electricity was installed. It was crowned by a 56-meter chimney. Both the building and the equipment were completed in 1897 and the supply of electricity to Barcelona began.

The installation of an Oerlikon turbo-generator (1908) and other expansions enabled the plant to start supplying an additional 6,000 volts of alternating current beginning in 1910. When in 1912 the Sociedad Catalana para el Alumbrado por Gas changed its name to Catalana de Gas y Electricidad, one of the operations was the takeover of the Central Catalana de Electricidad, having previously acquired Lebon's 50% stake.

The new owner, Catalana de Gas y Electricidad, reserved 5,877 square meters on the grounds of the Vilanova power plant where it set up warehouses, workshops and even an ice factory. However, the primary result was an accelerated

237. NFHA, SCAG. *Acuerdos SCAG-Lebon* (28-04-1896).

boost to investment and activity with the construction of the first underground high voltage network in Catalonia, at 50,000 volts, between the Vilanova plant and the sub-station on Calle Viladomat. Further improvements and additions were also made in the years 1915-1916.

However, in a few years, the commissioning of the Sant Adrià plant and the arrival in Barcelona of the hydroelectric energy produced at the El Run waterfall in Huesca meant that the oldest facilities of the Vilanova plant ceased to produce electricity in 1918, and it remained as a large transformer and converter station fed from Sant Adrià. The machines were dismantled and moved to Sant Adrià or to the Catalana de Gas y Electricidad power plant in Seville.

When the Associació del Museu de la Ciència i de la Tècnica i d'Arqueologia Industrial de Catalunya decided in 1997 to select the 100 most representative elements of Catalonia's industrial heritage, it included the Vilanova plant in its selection as one of the best examples of the restoration of an industrial building.²³⁸ Currently, in 2018, it is the headquarters in Catalonia of Endesa, the Enel subsidiary.

The Building at Calle Arcs 10 (1905)

The definitive establishment of the Central Catalana de Electricidad in the Barcelona market, after the commissioning of the Vilanova plant in 1897, led to a search for where to build its headquarters. To this end, on April 30, 1903, a house was acquired from Ramon and Ricardo Morera on Carrer dels Arcs, 10, where the Cendra and Caralt warehouses had previously been located, with a surface area of 32,000 palms.²³⁹ The project was commissioned to the architect Arnau Calvet Peyronill, author among other works of the Mercado de Sarrià, the stations of the funicular of Vallvidrera, the Almacenes Jorba, as well as Manresa's original house, and those on the Portal de l'Àngel of Barcelona, etc.

The construction, completed in 1905, presents a building of an original style within the tendency known as the Viennese *Sezession*, a movement practically without representation in Barcelona. La *Sezession* is a style of modernism initiated in 1897 by Gustave Klimt in Vienna, who began this aesthetic revolt along with nineteen students. Great figures of the style include Otto Wagner, Joseph Olbrich and Josef Hoffmann. The building has a symmetrical composition with vertical stone elements framing the balconies, supported by corbels with female

238. Feliu (2002), pp. 150-153.

239. NFHA, SCAG. *Junta General de Accionistas* (29-04-1904).

heads and ornamentation of vegetal motifs. The façade features eight three-arm lamps with globes. The rear façade corresponds to Calle Capellans 5. It does not have a basement so to speak, but does have an underground passageway that old traditions say offered access to inside the city walls in the Middle Ages, when an inn was located on the site.

The building was used as the headquarters and offices of the company, later it was transferred to Catalana de Gas y Electricidad, then to Hidroeléctrica de Cataluña, again to Catalana de Gas y Gas Natural SDG, and finally it was sold for refurbishment as a hotel. It is included in the catalogue of the city's architectural heritage.²⁴⁰

The Changes at the Turn of the Century

The loss of Cuba in 1898 marked a time of change and evolution that was perceived in different ways in different parts of Spain. In Madrid there was a feeling of defeat, of definitive liquidation of the Spanish Empire and of a period overcast with gloom for the immediate future. This sense was conceptualized on an intellectual level by the Generation of '98, which amplified the negative feeling of an end of a glorious era for the country in the international context.

However, in Catalonia, which had important economic interests in Cuba, the approach was more pragmatic; the return of the *Indianos*²⁴¹ and their capital created a positive feeling that a new stage could be faced with a dynamic, prepared and enterprising bourgeoisie and with adequate financing. During the second half of the 19th century, a movement had been taking shape to recover Catalan identity, based on the literary and cultural *Renaixença*²⁴², which facilitated, with the clear involvement of the bourgeoisie, the emergence of important artistic expressions such as modernism, present in almost all the creative activities of the time.

The constitution of parties such as the Lliga Regionalista in 1901 — with leaders such as Prat de la Riba, Cambó, Ventosa or Abadal — contributed to an important involvement of the Catalan bourgeoisie in the defense of the interests of Catalonia, but with an absolute will to try to contribute to a process of Spain's regeneration

240. Cercador Patrimoni Arquitectònic. See w123.bcn.cat/APPS/cat_patri/ [consulted 02-11-2017].

241. Translator's note: The *Indianos* were Spaniards who had made fortunes in the Americas, in the case of Catalans, primarily in Cuba

242. The movement of literary and cultural renaissance in Catalonia.

and modernization. It is only necessary to recall the first verses of the Ode to Spain by the poet Joan Maragall: *Escolta, Espanya — la veu d'un fill que parla en llengua — no castellana* (“Listen Spain — to the voice of a son who speaks in a language — not Castilian”).²⁴³ The strange mixture of sensibility arising from the social fabric, political pragmatism, the development of art and business, of feeling towards Catalonia and respect for Spain, achieved an indescribable situation of *seny*²⁴⁴ from the perspective of identity and responsibility.

In a few years, the whole of Spain likewise noticed the return of financial capital after Cuba was definitively abandoned, which made it possible to help create the powerful Spanish banking community. With these contributions, the Spanish business situation changed. In the years immediately afterwards, the financial capacity of the new institutions helped create Spanish industry backed by banks, which was a clear characteristic of the Spanish industrialization process for many years. In the energy sector, the most important business of the day was electricity, and so the country's large electricity companies appeared, essentially created by the Spanish banks.

The great challenge of the immediate future was the introduction of hydropower. Thermal electricity had not been an important rival to gas, the plants produced small quantities of energy and were expensive due to their use of coal. But if solutions were found regarding the introduction of electricity produced by waterfalls, which consisted mainly of losses in transmission and large capital requirements, the amount of energy available would be almost inexhaustible and its costs significantly more competitive. It would be the big change. The first decade of the century was ten years of preparation for this great change, which came in 1911. In addition, the introduction of hydropower in Spain differed territorially from the introduction of gas in the mid-19th century. While gas was introduced into Catalonia basically by local capital and in the rest of Spain by way of multinational investments, hydropower followed the reverse scheme: in Catalonia it was introduced by big multinational capital, mainly Barcelona Traction, while in the rest of Spain it was introduced by companies promoted by the large Spanish banks that began to appear.

A far from insignificant consequence of this phenomenon is that it produced a significant change in the trend of Spanish legislation in relation to the foreign investment that had previously been dominant in Spain, and present in Catalonia

243. Original text in Catalan.

244. *Seny* is a Catalan word that defines the deliberation and prudence present when speaking or acting.

albeit less intensely. Thus, in 1900, the first Decree prohibiting foreigners from bidding on the award of a public service was published, followed by another Decree in 1907 requiring public service tenderers to use only articles of national origin. These elements, which culminated during the dictatorship of General Primo de Rivera, led to the departure from Spain of many multinationals that had previously been present in the country for years, such as Lebon and Lyonnaise des Eaux.

In the gas sector during these years, three important companies existed in Spain with various gasworks: the Sociedad Catalana para el Alumbrado por Gas, E. Lebon y Cía. and the Compañía Madrileña de Alumbrado y Calefacción por Gas. The only local company was the Sociedad Catalana, since Lebon was French, and the Compañía Madrileña was a subsidiary of the *Crédit Mobilier* of the Pereire brothers, also controlled from Paris. In addition, other small companies existed, most of them located in Catalonia, where in 1901 there were 35 gasworks, 5 of which were in Barcelona (Barceloneta, Gràcia, Sant Andreu, El Arenal and Sant Martí).

The relations between the different companies were friendly because, after the Catalan-Lebon differences were overcome, they did not compete for the same geographic markets. They were united against a common enemy, electricity, although the most important gas companies were also adding electricity to their business.

From 1896 until at least 1903, the large companies were grouped together in a common body for the defense of their interests called the *Comité de Fabricantes de Gas*, made up of the company, Cía. Madrileña de Alumbrado y Calefacción por Gas, the Compañía Central de Alumbrado Eugenio Lebon y Cía., and the Sociedad Catalana para el Alumbrado por Gas, represented by José Mansana. Laureano Figuerola, former Minister of Finance, who introduced the peseta as Spain's currency unit, president of the Compañía Madrileña was appointed president of the Committee. The new group presented petitions, carried out studies and actions and worked continuously to defend the interests of the Spanish gas industry as a whole.

The government's attempt — during the Cuban war — to introduce an excessive new Special War Tax, which affected both gas and electricity, in the order of 25% of the sales price, also helped the integration of companies in the sector. To fight the project, the interests of the gas and electricity companies were brought together on an important common front.²⁴⁵

245. The draft Law on State Budgets for 1898-1899 defined a gas sales tax of 0.06 ptas/m³ on average prices in Spain of 0.25 ptas/m³. In the case of electricity, it stipulated 0.20 ptas/kWh on average prices of 0.80 ptas/kWh. PFHA. SCAG. *A la Comisión de Presupuestos del Congreso* (16-05-1898).

The Barceloneta Gasworks of Domènech Estapà

Once electricity activity commenced with the opening of the Vilanova plant, which definitively began operating in 1898, the Sociedad Catalana once again focused on gas; it tried to ensure that the growth of electricity did not affect its traditional markets and began a process of modernization and updating of the facilities in order to be prepared for the arrival of what would be the great competition: hydroelectricity.

One element of defense was the introduction of the Auer lighter²⁴⁶, which improved both the technological and economic efficiency of gaslights for customers. The new light was much whiter and used much less gas to produce. The gas companies suffered in their sales, but better consolidated their competitive position against electricity.

The Sociedad Catalana also undertook a major renovation of its facilities in Barcelona, the Barceloneta gasworks, which underwent an important overhaul and modernization. The process began with the installation of COZE ovens with inclined retorts (1900-1903)²⁴⁷, which made the same production possible but required half the number of workers; a significant improvement in productivity was thus achieved, but labor problems arose in adapting to the new situation, which took some years to resolve.²⁴⁸

Almost simultaneously, with the idea of carrying out an important remodeling of the gasworks and its adaptation to the latest technologies, land was acquired adjacent to the Pfeiffer heirs and the Barceloneta bullring.²⁴⁹ With the new spaces available, it was possible to redesign the gasworks, its equipment, its buildings, its internal distribution, etc., with the aim of increasing production capacity by 50 % in 2-3 years. Swiss engineer Adolfo Studer Rubin was hired as the new factory manager to develop the technical side. The expansion consisted of 15 furnaces with 150 vertical, mechanically loaded and unloaded retorts built and installed by Stettiner Chamottenfabrik AG vormals Didier; the Berlin Anhaltische Maschinenbau Aktiengesellschaft was also involved.

246. Carl Auer von Welsbach, an Austrian inventor who developed incandescent sleeves using thorium oxides to improve gas lights, managed in this way to surpass the light of existing electric incandescent lamps. Alayo y Barca (2011), pp. 301-303.

247. NFHA.SCAG. *Junta General de Accionistas* (19-04-1901).

248. "... in the gasworks the workers continued to show a passive resistance to working in the new kilns in the way and manner that had been established in gasworks where appliances of the same type operated". NFHA.SCAG. *Junta Directiva* (17-03-1902).

249. NFHA.SCAG. *Junta Directiva* (05-02-1902).

The architectural part of the project was commissioned to the well-known architect Josep Domènech Estapà, who designed buildings, naves, towers, walls, etc. In short, everything that was required for an installation of this size, a small city with a new urban development in the personal style of the renowned architect, which was finally inaugurated in 1907. The following year he received a special mention from the Jury of the Architecture Prize of the City Council, which praised the complex as “a colossal industrial temple”. Two of the architectural elements that make up the gasworks have survived to the present day, both of which are by Domènech Estapà: the Torre de las Aguas (Water Tower) and the building where the management and offices of the gasworks were located, both of which are included in the catalogue of the city’s architectural heritage and are incorporated into the current Parque de la Barceloneta.

The Torre de las Aguas (1906) served as a water tank for the complex, but due to its height of almost 45 meters it was highly visible and became an emblematic feature of the complex, with the idea that, in addition to fulfilling its function, it would be a high quality aesthetic contribution in a clearly modernist style.

An octagonal body rises over a square base with loopholes that follow the interior staircase; it is supported by pairs of ribs that in the upper section act like a pointed arch, which appear like corbels that support the upper circular tank, covered with ceramic with a series of double openings. The crown is conical, with four openings in the shape of mansards, also covered with glazed ceramic. The Associació del Museu de la Ciència i de la Tècnica i d’Arqueologia Industrial de Catalunya (Association of the Museum of Industrial Science and Technology and Archaeology of Catalonia) classified it in 1997 as one of the hundred most representative elements of Catalonia’s industrial heritage.

The office building on Calle Ginebra (1907) was designed to house the gasworks management and the offices that administrated the entire complex. Modernist in style, it was built in exposed brick, a material widely used at the time for industrial buildings. It consisted of a ground floor and a floor on a rectangular floor plan, with a central top with a segmental arch and a crown with geometric shapes. But this was only the first section, as in 1909 another 15 ovens were added to the gasworks. The size of the complex became truly important; as an example, coal silos were conditioned for the storage of up to 15,000 tons of coal, with the corresponding conveyor belts.

It was the last great restructuring of the Barceloneta coal-fired gasworks. The new times were fast approaching and a symbol of the future would perhaps be

the appearance of a lazaretto next to the gasworks to treat the periodic epidemics of cholera and yellow fever that appeared in the city. The facility was inaugurated in 1905 and was the base of a hospital of infectious diseases (c. 1929), which would eventually become the present Hospital del Mar. When the first medical installations were built, the workers of the Barceloneta gasworks strongly expressed their disapproval, due to the risk posed to them of a neighboring facility for this type of infectious disease. With time, the gasworks disappeared and the hospital is now one of the best known in the city.

These years of important changes in gasworks and working conditions coincided with a period of significant trade union and workers' activity in Barcelona. However, the Sociedad Catalana also had its own nuances and attitude in this area; thus, in the general strike of 1902 the workers of the gasworks did not participate, and in the Board of Directors it was commented that: "in spite of the general strike, all the workers and employees of the Company went to work every day"²⁵⁰, although in the following months they did try to improve their working conditions.²⁵¹ In the strike of the Lebon company in November of 1903, the workers of the Sociedad Catalana likewise did not participate, although they again asked for improvements in their working conditions a few weeks later.

These were difficult times, of heated conflict, when the company had to modernize its facilities and obtain synergies to reduce costs and become more competitive. The number of workers had to be reduced, but at the same time the modernization of the technology made it possible to reduce or eliminate the most dangerous jobs through the automatic loading and unloading of furnaces, conveyor belts for coal haulage, etc.

During the Tragic Week in July 1909, gas production was suspended for three days, while the Central Catalana de Electricidad operated normally. However, the Sociedad Catalana's social concern led to its participation in 1910 in the benefits of employees and workers through the Caja de Pensiones.

Despite the progressive introduction of electricity in Barcelona, the company's strategy achieved its results, since during these first years of the century gas consumption grew constantly. Improvements in the quality of the gas, its greater availability, the introduction of the Auer burner, new uses, the containment of

250. NFHA.SCAG. *Junta Directiva* (26-02-1902).

251. One result of the strike of 1902 was the constitution of the Caja de Pensiones para la Vejez y de Ahorros to help the working class, historical antecedent of La Caixa.

production costs, etc., all had the effect of ensuring that gas consumption did not fall, but rather grew in its market share in the city.

Innovations were also developed in the company's other gasworks; thus, supply to the Sant Andreu del Palomar gasworks in 1909 was begun from the Barceloneta gasworks, which had already been enlarged and improved, which allowed the old and not very productive Sant Andreu gasworks to be closed. In the case of Ferrol, as has been indicated, the gasworks had ended its activity in 1898.

At the beginning of the century, new furnaces were introduced in the Seville gasworks, as in Barcelona, which produced good results. In 1905, it was stated that: "at present, with eight furnaces, production is almost the same as before, when thirteen were needed"²⁵²; however, the construction of a new gasworks was not considered until 1910, after having renovated the one in Barcelona. The same year a new technical director, in this case the English engineer Mr. Bailey, joined the company. Consumption continued to increase in the early years despite competition from electricity from the Compañía Sevillana; however, from 1905 onwards demand fell steadily, and the gas company reacted by "fixing the internal installations of large consumers" and "promoting the use of gas for heating".²⁵³

Subsequently, once the new Barceloneta gasworks was completed, it was time for a major change in the Seville gasworks, where it competed with the Compañía Sevillana de Electricidad, a subsidiary of AEG. In 1910, Mansana informed the Board that he was "studying the transformation of the gasworks in Seville to bring it up to date with modern procedures, just like the Barceloneta gasworks, and that he was also studying the advisability of installing a electrical power station in that city to deal with all the eventualities of the future"²⁵⁴, the City Council's desire to replace public gas lighting with electricity, and the electricity needs of gas customers that La Sevillana refused to supply.

Land was acquired, 100,000 square meters to house the new production facilities and a central building on Calle Rivero for the company's headquarters and offices. Berlin Anhaltische and Oerlikon were commissioned to carry out the technical projects for the gasworks and the electrical power plant respectively. The new installations began functioning and the offices were moved in July 1914.

252. NFHA.SCAG. *Junta Directiva* (03-11-1905).

253. NFHA.SCAG. *Junta Directiva* (03 and 08-11-1905).

254. NFHA.SCAG. *Consejo de Administración* (20-07-1910).

The New Board of Directors

The approaching change, hydroelectric power, did not go unnoticed and the company prepared for it with a major alteration of its gasworks, but also with a modern adaptation of its decision-making bodies and financial possibilities: important changes in its Articles of Association and a substantial increase in share capital.

When the process of studying a new corporate framework began, the chairman of the Board of Directors, Álvaro M^a Camín, explained these plans by stating: “the Articles should be adapted to the reality of the facts and be modified in the sense of their adaptation to the current way companies such as ours function”²⁵⁵, and added that: “modifications that recognized the need to give more unity of action to corporate management, making it more expeditious and capable of taking advantage of opportunities to carry out good business that depended on swift resolution”²⁵⁶ should be presented at the General Meeting.

Basically, the governance structure of the company was changed. Until then, there had been a Board of Directors or Management Board that governed the company and a Supervisory Board that acted as a Supervisory Committee, while the general manager directed things on a day-to-day basis. The change involved the elimination of the Board of Directors and the Supervisory Board, and the establishment as a governing body of a modern Board of Directors, composed of between 7 and 13 members, necessarily shareholders, from whom a chairman and a secretary was elected.

The extraordinary importance that the general manager had had in the company was recognized; thus, the new Articles established that the Board would elect an additional manager by co-optation who would be the managing director (also a modernized name for the general manager). Mansana’s strength was felt when he was appointed by the Board, but to remove him from office required a resolution of the General Shareholders’ Meeting.

The change was significant, first because of the arrival of what in current terms is a modern governing body, but also because of the positioning of the managing director, José Mansana Terrés. And indeed, that was what was sought, greater flexibility and operational agility for the times ahead, which would undoubtedly

255. NFHA.SCAG. *Junta Directiva* (14-02-1906).

256. NFHA.SCAG. *Junta General de Accionistas* (28-04-1906).

Table 28. Sociedad Catalana para el Alumbrado por Gas. Board of Directors (1906)

Name	Position
Álvaro M. ^a Camín López	Chairman
José Mansana Terrés	Member of the Board and Managing Director
Juan Desvalls Amat, Marquis of Alfarrás	Member of the Board
Juan Masó Bori	Member of the Board
Virgilio M. Mora Molins	Member of the Board
Juan García Solá	Member of the Board
Francisco Robert Yarzabal	Member of the Board
Ramón Poy Salichs	Member of the Board
Manuel Porcar Tió	Member of the Board
Pablo Torras Pascual	Member of the Board
Raimundo Puig Durán	Member of the Board
José Vieta Argemí	Member of the Board
Narciso Marlés Coll	Member of the Board
Adolfo Oller Bosch	Member of the Board and Secretary

Source: NFHA.SCAG. *Junta General de Accionistas* (28-04-1906) and *Consejo de Administración* (07-06-1906).

require changes, and very rapid changes. The duration of the company, whose existence was slated to be terminated in 1923, was also extended until 1956.

After approval by the General Meeting of Shareholders, the first true Board of Directors was constituted on June 7, 1906 (Table 28).

The change of system also brought about a change of people, and the new Board was somewhat more high-level and socially representative, and this was only the beginning. Chairman Álvaro M^a Camín was a very prominent lawyer from Barcelona; the following anecdote published by the well-known writer Josep Pla in his book *Un senyor de Barcelona* is enough to introduce him:

The Camín family was a large family of men of law, both civilian and military. On one occasion a stranger showed up at the door of Mr. Camín's office.

- Mr. Camín? he asked with his hat in his hand.
- There are four of us.
- I'm asking for the lawyer, Mr. Camín.
- There are three of us.

- Exactly, I would like to speak with Don Alvaro....
- There are two of us....
- I would like to talk to... do you follow me...? The wisest one, with the one who is so famous...
- That's me. Come in!

Other board members included the Marquis of Alfarrás, traditionally linked to the Caja de Ahorros de Monte de Piedad de Barcelona and to the company; Francisco Robert, brother of the mayor of Barcelona in 1899, Bartolomé Robert; Manuel Porcar Tió, who had been mayor of Barcelona in 1891; Pablo Torras Pascual, president of the Sección de Ciencias Exactas del Ateneo de Barcelona, and as Adolfo Oller Bosch, doctor and professor at the faculty of Medicine; and Raimundo Puig Durán, professor of civil law at the Universidad de Barcelona and a prestigious judge. The change was of great significance.

Once the issue of being able to make decisions with great dynamism and speed had been resolved, the other problem to deal with was the company's economic capacity to face the coming times and defend its shareholders economic interests; the general manager pointed out to the Board of Directors that: "the share capital is less than one third of the company's assets, an anomalous state, the shortcomings of which may appear in the future".²⁵⁷

The share capital in 1905 was 4,125,000 pesetas, represented by 8,250 shares of 500 nominal pesetas. This capital had remained unchanged since 1879, meaning it had been maintained for 27 years. A plan was devised to withdraw the existing shares from circulation and replace them with 24,750 new shares of 500 pesetas of nominal value, representing a capital of 12,375,000 pesetas, to be delivered at a ratio of 3 for 1. The 8,250,000 pesetas that were added to the share capital came from the Depreciation Fund of the material that was reduced by the same amount; the share capital was thus tripled, and went from representing 12% of the balance sheet total to representing 36%.²⁵⁸

257. NFHA.SCAG. *Junta Directiva* (14-02-1906).

258. The accounting discipline of depreciation and its conception as the wear and tear of assets that no longer exist or as a source of financing has evidently undergone significant changes in accounting criteria over the years.

1911-1920

Catalana de Gas
y Electricidad and
Hydroelectricity

Since the 19th century, the situation of electricity in Barcelona had remained stable in terms of business structure. Two companies continued to exist: the Compañía Barcelonesa de Electricidad, dominated by the German AEG, which produced thermal electricity at its Paralelo power plant, and the Central Catalana de Electricidad, controlled by the Sociedad Catalana para el Alumbrado por Gas and the French company Lebon, the two gas companies in the city, which also produced thermal electricity at the Vilanova plant.

What had changed was the relative size of the two companies, which until 1900 had remained the same, after which La Barcelonesa grew much faster; while initially La Catalana represented approximately 40% of the total installed power, at the end of the period it represented only 20%.

In recent years, however, technology had evolved and so had the methods of the financial markets, and it was now possible to think of taking advantage of the hydroelectric power of rivers far from the city with all their capacity to produce electricity in large quantities and at lower cost.

Barcelona was a great center of experience and confrontation from 1911 onwards; in just two months three companies were formed, arising from different groups and with personalized styles to undertake the same activity: develop hydropower and be able to supply the city with, so to speak, the *new electricity*.

Thus, Barcelona Traction Light and Power appeared, constituted in Toronto (Canada) on September 12, 1911 by a group led by the American engineer Fred S. Pearson and which at the Spanish level had the support of the engineer Carlos Montañés.

The Sociedad General de Fuerzas Hidroeléctricas was also created in Barcelona on October 28, 1911 by a group led by the Sociedad Catalana para el Alumbrado por Gas and its managing director, José Mansana, who relied on the hydropower development concessions of Eusebio Bertrand Serra and Francisco Bastos.

And finally, the Energía Eléctrica de Cataluña, also constituted in Barcelona on November 18, 1911 by a group formed by French and Swiss backers, led by the Compagnie Générale d'Electricité de Paris. At the Spanish level, it was supported by the concessions of Emilio Riu Periquet.

Obviously, just for the record, the Germans of AEG also remained in the city; therefore, a dense multinational scenario was formed that included only one Spanish shareholder company, the Sociedad Catalana para el Alumbrado por Gas.

As we will see, all sorts of links, mixings, purchases, takeovers and combinations began to appear to give shape to a new future; as a first orientation, we can mention that Barcelona Traction ended up dominating the Compañía Barcelonesa

de Electricidad and Energía Eléctrica de Cataluña, to end up years later in bankruptcy; the property then passed to a new company, Fuerzas Eléctricas de Cataluña (Fecsa), promoted by Juan March, which was later absorbed by Endesa, the main shareholder of which is currently (2018) the Italian group Enel.

The Sociedad Catalana para el Alumbrado por Gas was eventually transformed into Catalana de Gas y Electricidad, then into Catalana de Gas, Gas Natural SDG and later Gas Natural Fenosa. It is now known as Naturgy.

The Evolution of Technology and New Multinationals

Edison's early designs, and most importantly, his patents, were made on direct current²⁵⁹; in fact, his power plants supplied electricity at a voltage of 110 volts because it was the most suitable for the filaments of his incandescent lamps to function properly.

Direct current was appropriate to operate incandescent light bulbs, as well as the motors that used electricity as their driving force, but it presented two significant problems: on one hand, if electricity had to be transported over a distance, the losses were very substantial due to the high resistance to the passage of electrons with such low voltages; and secondly, there were no transformers in direct current, that is, if two different voltages were required in a factory, one for lamps and the other for motors, they had to be specifically generated and transmitted in customized conductors, logically making the system more expensive.

Alternating current would be able to overcome these problems, the only obstacle was, it had yet to be invented. Nikola Tesla, as inventor, and George Westinghouse, as entrepreneur, played an important role in developing the new technology. They achieved the first effective application of alternating current in 1895 at the 5,000 horsepower Edward Dean Adams power station in Niagara Falls.

The other necessary element was for the turbines to make efficient use of the power of the water. By the end of the 19th century the two necessary concepts were available. There was the Francis turbine, which took advantage of large quantities of water, but with low falls or declines, and the one developed by Pelton

259. An electric current is a continuous flow of electrons through a conductor between two points of different potential; in direct current (DC) the electrical charges always circulate in the same direction (i.e. the highest and lowest potential terminals are always the same) and in alternating current (AC) the magnitude and direction vary cyclically.

based on the opposite concept, a free jet turbine with scoop-shaped blades to take advantage of almost the entire water jet, suitable for large falls.

Technological advances had solved the problem of how electricity could be produced massively and at reasonable costs. But other elements were needed; massive uses for electricity had to be found, not only in lighting but also in industrial processes and in the vast field of replacing steam boilers with electric motors. Likewise, new uses had to be found that required a significant supply of this energy, such as electric trams, which developed very closely alongside the new companies.

Finally, there was a need for companies and entrepreneurs capable of inspiring financial markets, and at the same time, capable of effectively implementing, within a short period, an unprecedented deployment of a new technology with its enormous production, transport and distribution facilities. In addition, there was the small detail of doing all this practically simultaneously in all countries of a certain economic level.

The multinational thermal electricity companies had applied a model conceptualized in Germany by AEG, the *Unternehmergeschäft*, which was aimed at arriving in a country or city and developing a new power plant that would allow the parent company to export industrial machinery and thus expand their own market with the support of friendly banking institutions that could maintain the shares of these companies, until it was time to place them on the market with their demonstrated profitability. It was the scheme that AEG had applied, for example, with the Compañía Barcelonesa de Electricidad. The most important thing in this model was not to sell electricity; the important thing was to be able to sell machinery and installations to electricity customers, usually taking advantage of the available patents. Financial support came from financial companies usually in Belgium or Switzerland, where laws governing these types of companies were relatively lenient.

The new model that appeared with hydroelectricity, which can be called the Canadian model because it was how Pearson and Barcelona Traction operated from Canada, was based on the belief that the important thing was to sell electricity; the machinery was bought on the market, but having a few customers and a dedicated thermal power plant was not enough to sell electricity. The scale of hydroelectricity had to be higher, larger spaces had to be sought, a whole city, county or region, structuring the whole supply, if enough waterfalls existed at a reasonable distance. One feature of this model was the need to reduce

competition as much as possible, by acquiring and closing the previous small thermal power stations, as well as controlling the consumption of railways and trams.

Financing was similar, it required someone to hold the shares, and to issue bonds and debentures in the market in order to raise the necessary resources; the dependence was therefore more on the securities markets than directly on the banks. The corporate law used at the time was the Canadian, which was very liberal with this type of financial approach.

In addition, at the structural level, the new multinationals producing and supplying machinery and equipment for the electricity sector were involved in an accelerated process of integration and verticalization; two countries led the world market: Germany and the United States, which in 1913 already controlled 62% of international trade in the sector. In Germany, in 1890, three companies controlled 70% of the market (AEG, Siemens & Halske and Schuckert) and had agreements between them. In the United States, the Edison companies that had helped create AEG in Germany eventually merged with Thomson-Houston, which in turn had created the Union Elektrizitäts Gesellschaft (UEG), to form the General Electric company. Finally, AEG absorbed UEG. In short, an important network existed of interests and activities.

The great growth and the worldwide penetration of the new companies producing electrical equipment in the generation and distribution of electricity had given rise to a business sector of extraordinary size, which, on the other hand, due to the continuous advance of a still incipient technology and the very important financial requirements, had been consolidated and become concentrated on a world level. For all these reasons, Lenin, in his work *Imperialism, The Highest Stage of Capitalism*, chooses as a primary example the electro-technical industry, even before oil, the merchant navy, or the railway industry, to speak of capitalist concentration.

Pearson and Barcelona Traction Light and Power

The creator of Barcelona Traction Light and Power was the American Fred S. Pearson (1861-1915), who was the paradigmatic example of a new way of doing business in the international electricity sector. He had been a chemistry professor at MIT²⁶⁰ and had worked for mining and electrical companies in the United States

260. Massachusetts Institute of Technology.

Table 29. Barcelona Traction and Pearson's previous projects (1899-1911)

Project	São Paulo (1899)	Mexico (1902)	Rio de Janeiro (1904)	Barcelona (1911)
Population of main city	240,000 (1900)	541,000 (1900)	730,000 (1904)	587,000 (1910)
Area served (km ²)	1,522	1,479	1,182	32,114
Generation capacity (CV)	12,200	110,000	84,000	169,000
Central distance to city (km)	33	148	75	123
Value of the initially subscribed bonds	4,000,000 dollars	5,000,000 dollars	4,000,000 dollars	4,000,000 pounds

Source: Gangolells (2008), p. 138.

and Latin America, but he earned his aura beginning in 1899, when he decided to reorient his activity to become a consultant and promoter of high level projects in the sectors he knew.

Pearson's approach of clearly making the best of transnational advantages was very new; he worked on multiple projects and in different countries at the same time and with a well thought-out organization²⁶¹:

- The companies were legally headquartered in Canada (Toronto), taking advantage of Canadian law.
- Financial matters, stock and bond underwriting, initial offers and international banking were located in Great Britain (London).
- Matters related to engineering, purchasing, logistics and construction management were located in the United States (New York).
- Industrial assets and the actual operations of the companies were located in the corresponding country.

As you can see the model is different from others. Pearson was not the leader of a large company, he was a great promoter who looked for opportunities and built projects; for each project he looked for the right technical and financial solution, and raised the necessary capital. Using this type of model, perfected over the years, Pearson expanded his activity, establishing a presence in São Paulo (1899), Mexico City (1902) and Rio de Janeiro (1904) prior to Barcelona (Table 29).

261. Cooke (2003), pp. 1-4.

Carlos Montañés, an industrial engineer from Barcelona, managed to interest Fred S. Pearson in the possibilities of developing a new project in Barcelona, given the possibilities the city and its hinterland presented.²⁶² The first contact was in July of 1911 and by September, holding and vehicle companies were already being set up, including for industrial investments. In October, the project was finalized in detail in situ, concession transfers were negotiated and discussions were held with the authorities. The project was global for Catalonia: waterfalls, transmission lines, acquisition of small local producers, etc. were all designed and taken into account.²⁶³ On how to get around the Spanish legislation prohibiting foreigners from investing in the construction of waterfalls, the idea was that “some time would be needed to work on this obstacle”, as Peter Hertner points out.²⁶⁴

The financial framework involved the incorporation of different companies, taking advantage of Canadian laws, which facilitated the issue. Berenguer Gangoellés explains that: “Canadian commercial law allowed companies to be formed with immense share capital and all the shares to be distributed among the promoters without the obligation of having to subscribe in cash”.²⁶⁵ Pearson’s group’s financial “skills” also included stock watering²⁶⁶ and similar practices. An example of this type of financial solution is the sale by Spanish Securities, a company with \$40,000 of capital, of \$25 million worth of assets to Barcelona Traction in those months. The necessary hydroelectric development concessions were provided by Domingo Sert²⁶⁷ on the Noguera Pallaresa River and by Ignacio Romagna on the Segre River (Table 30).

Pearson’s project included three waterfalls, the first of which was the Seròs waterfall, and many kilometers of 110,000 volt transmission line to supply the market in Barcelona, but also in Catalonia, and for this purpose, it needed to control the existing electricity companies.

Pearson moved very fast, mainly in the financial field. His first objective was the *Compañía Barcelonesa de Electricidad*, owned by the German AEG, which was the

262. Roig (1970), p. 252.

263. Cooke (2004) indicates that Joseph Bordogna of the National Science Foundation used the expression “nonstop idea-to-reality machine” to define Pearson, such was his level of activity.

264. Hertner and Nelles (2004), p. 8.

265. Gangoellés (2008), p. 99.

266. Stock watering consisted of artificially inflating the value of a company’s assets and then selling the shares to unsuspecting investors, usually European, of these more or less invented securities, as well as ‘decorating’ the boards of directors with well-known and prominent figures in order to foster trust in the respective companies. Fàbregas (2015b), pp. 14-15.

267. Domingo Sert had been a member of the Cortes for Barcelona (1896-1898) and for Lleida (1901-1903).

Table 30. Principal companies of the Barcelona Traction group (1911)

Company	Incorporation	Headquarters	Capital (dollars)
Spanish Securities	05-08-1911	Toronto	40,000
Barcelona Traction Light and Power	12-09-1911	Toronto	40,000,000
Ebro Irrigation & Power ²⁶⁸	12-09-1911	Toronto	2,500,000

Source: Fàbregas (2012g), p. 34.

largest producer and distributor of thermal electricity in Barcelona in competition with the Central Catalana de Electricidad. Pearson gained control of it on December 6, 1911. Procurement activity continued in the years that followed. In 1912 he acquired the Saltos del Segre, the Badía Mañé Plant, Sociedad Electricista de Tarrasa, Compañía General Eléctrica de Mataró and the Electricista Catalana. In 1913, the list already included companies such as Gasómetro Tarraconense, Cooperativa Eléctrica de Valls, La Eléctrica Catalana, Eléctrica Igualadina, Electra Villafranesa, Electricista del Vallés, Manresana de Electricidad, Eléctrica de Mollet, Eléctrica de Sabadell, Eléctrica del Vendrell and Sociedad General de Electricidad de Tarrasa.

To close the cycle of exhibition of the new dimension, forms and style, in 1913 Barcelona Traction also acquired 49% of the shares of Energía Eléctrica de Cataluña. In short, in just two years, all the small local Catalan companies and the multinationals in the sector had been practically eliminated or absorbed by the Canadian company. Only the Sociedad Catalana para el Alumbrado por Gas remained independent.

However, the Pearson group's growing power in Catalonia began to waver in 1914. A period of financial problems, renegotiations of the terms of the debt issued and other situations began, culminating in the resounding bankruptcy of Barcelona Traction in 1948.

Azaria, Riu and Energía Eléctrica de Cataluña

The founder of Energía Eléctrica de Cataluña was the Egyptian Pierre Azaria (1865-1953). Originally called Boutros Azarian, he was born in Cairo and came from a family of Orthodox traders, known as Egyptian Armenians. Azaria studied

268. Ebro Irrigation & Power was registered and known in Spain as Riegos y Fuerzas del Ebro.

Table 31. Energía Eléctrica de Cataluña. Shareholders (1911)

Shareholder	Origin	Capital (pesetas)	% participation
Compagnie Générale d'Electricité	Paris	4,700,000	47 %
Société Suisse d'Industrie Électrique	Basel	3,300,000	33 %
Cristóbal Massó Escofet	Barcelona	1,500,000	15 %
Emilio Riu Periquet	Barcelona	300,000	3 %
Other shareholders	—	200,000	2 %

Source: Nadal Piqué (1994), p. 85-86; Roca Rosell (1977), section 23, and by the author.

engineering at the prestigious *École Centrale* in Paris and graduated in the class of 1887.²⁶⁹ He first worked for *Electricité de Rouen*, which became *Société Normande d'Électricité*, whose shareholders included the *Banque Française pour l'Afrique du Sud* (Table 31).

His most important activity was the creation of the *Compagnie Générale d'Electricité* (CGE) on May 21, 1898 with a capital of 10 million francs and as a public limited company, which grouped together: *Société Anonyme des Usines Mouchel*, *Compagnie Générale des Lampes à Incandescence*, *Société Normande d'Electricité*, *Manufacture Française des Lampes à Incandescence*, *Compagnie Française pour la Pulverisation des Métaux* and *Société Française de l'Ambroïne*.²⁷⁰

The aim was to compete in the electricity industry market against the large, already established international companies, seeking lighting concessions in medium-sized cities to build the appropriate power plants and thus generate demand for industrial equipment produced by the company itself (cables, lights, insulators, accumulators, etc.), partly following the German model but with fewer financial resources; the technology and manufacturing licenses in many cases were provided by *Brown-Boveri* from Switzerland.

In 1911, Azaria set out to achieve significant strategic growth along three lines. On one hand, he continued to expand his conventional electricity business in France, where he had operations in Nantes, Angers, Bordeaux, Marseille and Nancy, and entered Brest and Meaux. Additionally, he started his activity in telecommunications. He also set in motion a process of internationalization in the

269. Sauvage (2010), pp. 6-8.

270. For the history of the *Compagnie Générale d'Electricité*, see Torres and Marseille (1992).

electricity distribution business by creating the Compagnia Generale Italiana di Elettricit  and Energ a El ctrica de Catalu a.

In Barcelona, the Compagnie G n rale d'Electricit 's strategy was to establish itself by generating thermal and hydraulic energy; to this end, it tried to take over the Compa a Barcelonesa de Electricidad in 1911, until the appearance of Barcelona Traction forced it to give up. In the hydroelectric field, the path led through the promotion of a new company in Barcelona, which was called Energ a El ctrica de Catalu a, constituted in 1911 with a capital of 10 million pesetas, and whose main shareholders were French and Swiss.

The Soci t  Suisse d'Industrie  lectrique (SSIE) of Basel, known as the Schweizerische Gesellschaft f r Elektrische Industrie (Indelec) in its German name, was a financial institution promoted by Siemens & Halske. In short, it was Siemens' entry into the electricity generation market in Catalonia.²⁷¹ Emilio Riu, journalist and deputy for Sort, and his brother-in-law Crist bal Mass  were the ones who provided the necessary hydraulic concessions in the province of Lleida.²⁷² Joan Carlos Alayo states: "It can be said that Emili Riu took over all the concessions that entered directly into his electoral district, that is, the Flamissell, Card s and Esterri valleys, and also the Catalan Garonne basin, either because he studied them and carried out the necessary administrative actions directly, or because he bought them from their owners, either himself or his brother-in-law Crist bal Mass ".²⁷³ (Table 32)

Energ a El ctrica de Catalu a's industrial plan consisted of the construction of the Cabdella power plant in the Flamissell lakes region, which was put into operation in 1914, and the construction of a thermal support plant in Barcelona in Sant Adri  del Bes s, inaugurated in 1913, the building of which could have been avoided had it managed to purchase the Compa a Barcelonesa de Electricidad.

271. Siemens had taken part in a municipal public lighting competition in Barcelona in 1889, which it did not win. Years later, it set up a representative subsidiary called Siemens & Halske Espa a y Portugal. Finally, in 1910 it began its important involvement in the country with the acquisition of La Industria El ctrica, S.A., an electrical machinery and equipment production factory in Cornell  de Llobregat, near Barcelona. See www.siemens.com [consulted 10-08-2012].

272. Emilio Riu, a native of Sort (Lleida), soon moved to Barcelona, and dedicated himself to journalism at *El Diluvio* (1893) and *El Diario Mercantil*, which sent him to Madrid as a correspondent. Later he collaborated with *El Heraldo* and *El Globo*. Married to the sister of the politician  ngel Ossorio y Gallardo, he became the editor of the *Revista de Econom a y Hacienda* until 1907, and in 1916 he created the *Revista Nacional de Econom a* with his brother-in-law Crist bal Mass  and his brother Daniel Riu.

In the political sphere he was a member of Congress representing the Partido Liberal for the district of Sort from 1901 to 1918, and then in 1923, and in the intervening years he was a senator. He was also undersecretary of the Ministry of Finance with Minister Eduardo Cobi n (1910).

273. Alayo (2007), p. 326.

Table 32. Emilio Riu. Performance in hydraulic concessions (1911-1919)

Year	Concessions	Movement
1911	Cabdella and Molinos	Contribution to the constitution of Energía Eléctrica de Cataluña
1913	Five concessions on the Noguera de Tor River (Noguera Ribagorzana tributary)	Contribution to the constitution of Fuerzas Hidráulicas del Alto Pirineo
1914	Esterrí, upper Espot, lower Espot and Llavorsí	Sale to Catalana de Gas y Electricidad
1917	Concession Garone River in the Vall d'Aran	Contribution to the Sociedad Productora de Fuerzas Motrices
1919	Six concessions on the Garone River	Acquired by Emilio Riu
1920	Molino de Sorpe	Sale to Catalana de Gas y Electricidad

Source: Alayo (2007), pp. 322-326 and by the author.

While Energía Eléctrica de Cataluña developed its projects in the industrial field, its lack of size in the financial area made it difficult for it to survive in the competitive market of Barcelona. Albert Broder states: “In the period leading up to the war [World War I], the company had to follow a day-by-day policy, giving up one asset to acquire another, in a constant effort to adapt to the ambitions of its surroundings”.²⁷⁴

Matters moved very quickly in that period, and the year after its incorporation, in 1912, it was already negotiating a possible merger with the Sociedad Catalana para el Alumbrado por Gas, which we will discuss later. Given the conditioning factors, in the first months of 1913 it abruptly reached a sale agreement with Barcelona Traction, which immediately took control of the company; the French shareholders disappeared definitively in 1923.

The Sociedad General de Fuerzas Hidroeléctricas

The Sociedad Catalana had already prepared itself in 1906 with the capacity to react quickly in the electricity sector, modernizing its management and governing bodies and significantly increasing its share capital. It had also recently modernized the Barcelona gasworks and optimized its operation. It had modernized the

²⁷⁴ Broder (1984), p. 1031.

gasworks in Seville and made the decision to enter the market of thermal electricity in that city to compete with Sevillana de Electricidad, controlled by AEG. The game could start.²⁷⁵

The Constitution of the Company

While Barcelona Traction was created in September of 1911 and Energía Eléctrica de Cataluña in November of the same year, the reaction of the Sociedad Catalana para el Alumbrado por Gas appeared in October of 1911 when the Sociedad General de Fuerzas Hidroeléctricas was created to harness waterfalls in the Pyrenees.

The first time that hydraulic energy was discussed by the Board of La Catalana was at the beginning of July of 1911, when José Mansana asked for authorization to enter into negotiations with other partners to advance in the constitution of a company dedicated to hydroelectric activities.

First of all, taking into account the state of concurrence in which we are in relation to La Barcelonesa de Electricidad, which after causing us enormous expenses, we must always lose out because we do not wish to undertake ruinous business on our part and considering, on the other hand, the example that all the countries of Europe and America provide us, by taking advantage of the waterfalls to produce electricity economically, has led him to think repeatedly, he said, of the need and convenience for our company of exploiting this kind of business, alone or in participation with other entities, because surely in this way we would be able to overcome the competition in Barcelona, and also establish a wide base that could give rise to new and greater prosperity for our company. All these important considerations, added Mr. Mansana, have motivated him to study numerous offers that have been made to him to enter this kind of business, having called his attention in particular the use of the Esera waterfalls that have the undoubted advantage over all the other Pyrenees of being accessible by road and located at an altitude that allows work throughout the year, and those of the Noguera Ribagorzana, on which the Central Catalana de Electricidad has an option contract.²⁷⁶

Mansana had been studying alternatives for some time. He had chosen the waterfalls of the Ésera River in the Pyrenees of Huesca as the most interesting, and

275. Fàbregas (2012g), pp. 38-51.

276. NFHA.SCAG. *Consejo de Administración* (08-07-1911).

proposed to make a specific company with other partners and the owners of the interested concessions. He believed his competition was La Barcelonesa de Electricidad, whose shares were being bought by the Compagnie Générale d'Electricité at the time. Pearson had not yet appeared on the scene, but in July he would make his first visit to Barcelona.

In short, in July, Mansana spoke formally for the first time about his project and in October he formed the company, while Pearson analyzed Barcelona in July and formed his company in September, and the Compagnie Générale, seeing that it would not succeed in acquiring La Barcelonesa, created its own company in November.

In the following weeks, Mansana opened two negotiations, one with the concessionaires of the Esera waterfalls, that is to say, Francisco Bastos Ansart and Eugenio López Tudela; and the other, "with figures of this city to deal in principle with the formation of a company dedicated to the exploitation of waterfalls..."²⁷⁷, which finally would be the Bertrand family of Barcelona, cotton textile entrepreneurs.

In order to finance the part of the operation that would correspond to it, the Sociedad Catalana decided to issue a mortgage bond of 6 million pesetas, to be repaid over 35 years at an interest rate of 4.5%. The mortgage guarantee was important because it included a very significant part of the company's assets, specifically the headquarters, the buildings of the Barceloneta gasworks and the gas pipelines in Barcelona. In September Mansana visited the Pyrenean sites with experts to evaluate their appropriateness and the decision was made to initiate the project and quickly set up the company.

On October 28, 1911, the Sociedad General de Fuerzas Hidroeléctricas (SGFH) was incorporated with a capital of 10,500,000 pesetas and an indefinite duration, with the corporate purpose of: "Studying, acquiring, organizing and operating all kinds of rights, concessions or companies directly or indirectly related to waterfalls, power transport or, urban and interurban means of transport, electric lighting or electrochemical and electrochemical and electro-steel industries and to those other objects of lawful trade that are deemed relevant".²⁷⁸ The headquarters was located at the same headquarters of the Sociedad Catalana para el Alumbrado por Gas at Plaza de Santa Ana 16 in Barcelona (now Avenida del Portal de l'Àngel 21) (Table 33).

277. NFHA.SCAG. *Consejo de Administración* (15-07-1911).

278. NFHA.SCAG. *Consejo de Administración* (26-10-1911).

Table 33. Sociedad General de Fuerzas Hidroeléctricas. Shareholders (1911)

Shareholders	Capital (pesetas)	% participation
Sociedad Catalana para el Alumbrado por Gas	4,000,000	38 %
M. Bertrand e Hijo	4,000,000	38 %
Francisco Bastos Ansart	1,250,000	12 %
Eugenio López Tudela	1,250,000	12 %

Source: NFHA.SGFH. *Copia escritura constitución Sociedad General de Fuerzas Hidroeléctricas*. Barcelona: Notary Gallardo (28-10-1911).

The shareholders made different contributions. The Sociedad Catalana and M. Bertrand e Hijo contributed cash, while Bastos and López Tudela jointly ceded the concessions and rights they had obtained or applied for in the Ésera River. The Sociedad Catalana, with a 38% stake, reserved half of the directors and management of the new company (Table 34).

In order to evaluate the financial effort or the risk assumed by the company in the new project (4 million pesetas in capital), it should be remembered that the investment made to acquire 50% of the Central Catalana de Electricidad in 1896 and enter the field of thermal electricity was 3 million pesetas, an investment that continued at the 1911 level. Likewise, the total investment in fixed assets (tangible

Table 34. Sociedad General de Fuerzas Hidroeléctricas. Board of Directors (1911)

Name	Position	Origin
Manuel Bertrand Salsas	Chairman	M. Bertrand e Hijo
Eusebio Bertrand Serra	Member of the Board	M. Bertrand e Hijo
Vicente Ferrer Bertrand	Member of the Board	M. Bertrand e Hijo
Francisco Bastos Ansart	Member of the Board	Bastos/López Tudela
Eugenio López Tudela	Member of the Board	Bastos/López Tudela
Álvaro M. ^a Camín López	Member of the Board	SCAG
Juan Desvalls Amat, Marquis of Alfarràs	Member of the Board	SCAG
Adolfo Oller Bosch	Member of the Board	SCAG
Pablo Torras Pascual	Member of the Board	SCAG
José Mansana	Member of the Board and general manager	SCAG

Source: *La Vanguardia*, October 29, 1911 and by the author.

and financial) as of December 31 1910 was 26 million pesetas, so the new investment was approximately 15% of the total, as it was shared with other shareholders.

Francisco Bastos Ansart and Eugenio López Tudela

Francisco Bastos Ansart (Zaragoza, 1875 - Barcelona, 1943) studied at the Academia General Militar of Zaragoza where he graduated as an engineer; later he was assigned to Cuba during the war (1897-1899), and on his return to Zaragoza, he drew up the project to build the base railway of the Minas y Ferrocarril de Utrillas company. He worked for Electroquímica Aragonesa as managing director (1903), a company where he installed its electric ovens, and where he developed the idea of taking advantage of the electrical energy left over from the power transport to Zaragoza, and began to study the possible waterfalls on the Ésera River. Electroquímica was one of the companies that in 1911 constituted Eléctricas Reunidas de Zaragoza, S.A. In 1909, he moved to Barcelona and began to collaborate with M. Bertrand e Hijo.

Eugenio López Tudela accompanied Bastos in 1910 and 1911, in obtaining hydroelectric concessions on the Ésera River, and in the constitution of the Sociedad General de Fuerzas Hidroeléctricas. López Tudela was a member of the Board of Catalana de Gas y Electricidad (1913-1942), wrote for the *Heraldo de Aragón* (1918), and in 1922 appeared as president of the Spanish Chamber of Commerce in Paris (Chambre Officielle de Commerce d'Espagne in France) and member of the Arbitration Court of the International Chamber of Commerce. Additionally, he was Spanish delegate at the International Exhibition of Decorative and Modern Industrial Arts in Paris (1925).²⁷⁹

In connection with the Ésera waterfalls, in 1910 Bastos and López Tudela jointly bought two concessions in June and three more in December. Bastos, as an engineer, developed a preliminary development project that he published in April of 1911 under the title *El grupo de saltos de agua del río Ésera y la traída de la fuerza hidroeléctrica a Barcelona* ("The group of waterfalls of the Ésera River and bringing hydroelectric power to Barcelona").²⁸⁰ They then entered into talks with Mansana and contributed their concessions in October of 1911 in the constitution of the new company.

From his office in Barcelona, however, Francisco Bastos developed many more subjects: the city's metro, the tramway in Palma de Mallorca and the manufacture of explosives in Melilla. He was also interested in machinery and supplies for the

279. A Decree of May 19, 1923 granted him the appointment of Knight of the Order of Isabella the Catholic.

280. Bastos (1911).

textile industry and on January 22, 1913 he founded the company Güell, Bastos and Bertrand Hermanos. The Güell and Bertrand family were major textile manufacturers in Barcelona. In 1917 the company acquired a prestigious company called John M. Summer from an Englishman established in Barcelona and dedicated to the same activity since 1856. It was later renamed Bastos y Compañía Sociedad en Comandita (1920), and finally Bastos y Compañía, S.A. (1942), which still exists today.²⁸¹

Bastos was also involved in political activity in the ranks of the Aragonese regionalist party (1917), linked to the Lliga Regionalista of Francesc Cambó. His relationship with Eusebio Bertrand Serra probably led him in this direction. He was elected as a member of parliament for Boltaña — where the falls of El Run (Seira) were located — in the elections of 1919, 1920 and 1923, and was also vice-president of the Unión Aragonésista de Barcelona (1920). Finally, he became a member of the Lliga Regionalista, with which he became a member of parliament for Barcelona in 1933. In the elections of February of 1936 he ran with the Frente Catalán de Orden along with Juan Ventosa Calvell and Pedro Rahola, but did not win the seat.²⁸²

When Cambó was Minister of Public Works in 1918, Bastos was appointed special delegate in Asturias with responsibility for the supply and distribution of coal²⁸³, in short, he was entrusted with organizing the transport and distribution of Asturian coal. When Cambó returned to government in 1921, Bastos was appointed managing director of the Compañía Arrendataria de Tabacos (CAT). Concerning this position, Eloy Fernández Clemente indicated that he managed it “as if it were a private industry, and criticized its disorderly manufacture and lack of a plan. Bastos fought against smuggling with six naval bases, carried out active surveillance of the Resguardo Terrestre, dismissed many corrupt officials and attacked on the ground in Morocco, thus meeting his primary enemy, Juan March”. His actions must have been effective because he continued in office with five different finance ministers until the arrival of the Primo de Rivera dictatorship in 1923. Bastos’ confrontation with Juan March, which had been very heated, continued for many years.

Francisco Bastos had another, perhaps less well-known facet, that of a writer. He published different works such as *El Desastre de Annual*, *Viaje a nuestras antiípodas dando la vuelta al mundo*, *Pistoleroismo. Historia trágica* (1935), and *El evangelio del honor militar y otros relatos* (1938).

281. See www.bastoscia.com [consulted 29-10-2017].

282. Concerning Francisco Bastos’ political persona, Eloy Fernández Clemente stated he was, “a friend of Cambó and militant of conservative Catalanism...” Fernández Clemente (2004), p. 145.

283. *Boletín Oficial del Estado*, April 21, 1918.

Manuel Bertrand Salsas and Eusebio Bertrand Serra

The capitalist partners that José Mansana obtained to activate the project of the Sociedad General de Fuerzas Hidroeléctricas would be the members of the Bertrand family, Manuel Bertrand Salsas and Eusebio Bertrand Serra, respectively father and son, grouped in the company known as M. Bertrand e Hijo.²⁸⁴

Manuel Bertrand Salsas was born into a family of French textile entrepreneurs based in Catalonia, but when he married Flora Serra Casanova, heiress of an important textile dynasty of *Indianas* that began in 1754, he began to work with his father-in-law Eusebio Serra Clarós, with whom he entered into partnership when he formed Serra y Bertrand (1878), and extended the activity to the entire cycle of cotton: spinning, weaving, printing and finishing. He was also interested in the exploitation of agriculture and livestock. He introduced beet cultivation into Catalonia, was one of the founders of the Sociedad General Azucarera (1903), and set up La Ricarda (1908), in the Llobregat delta, a model farm for the production of milk, cereals, legumes and fodder.²⁸⁵

His first-born son, Eusebio Bertrand Serra (1877-1945), was one of Catalonia's leading businessmen in the first half of the 20th century. In the textile industry, he received important installations from his father in Manresa and Barcelona, which he expanded with new factories and the purchase of other companies, until he was considered in 1935, as Aliberch notes, the world's foremost individual cotton magnate according to the newsletter of the Federation of Master Cotton Spinners Association of Manchester. Francesc Cabana explains: "His production was 3.6 million kilograms per year of yarn made from 75,000 spindles, 15 million meters per year of fabrics made from 1,200 looms, and 13 million meters per year of cretonne... At the same time, his factories consumed 4,000 tons of raw cotton a year and 2,200 people worked in them". The textile companies of which he was the sole owner were transformed into public limited companies, Textiles Bertrand y Serra, S.A. and Comercial Bertrand y Serra, S.A. almost at the end of his life, in 1940.

Eusebio Bertrand also had other facets. He was one of the founders of the Lliga Regionalista (1901), he stood for election as a member of the Cortes on various occasions, and was elected permanently in the period 1907-1923 for the Puigcerdà district from the lists of the Lliga, with whose leader Francesc Cambó he maintained an excellent relationship. He presided over the Liceo and Fomento del Trabajo, played the cello, was a racing car driver, was awarded the Order of Agricultural Merit (1913) for

284. Aliberch (1952).

285. Cabana (2006), pp. 396-398.

the exploitation of the La Ricarda farm, was a sailor and was present on countless company boards. In short, he led an intense and truly multi-faceted life.

In the field of hydroelectric activities, Eusebio Bertrand joined his father as a capitalist partner in the constitution of the Sociedad General de Fuerzas Hidroeléctricas in 1911, and replaced him as chairman of that company in 1912. Subsequently, in 1913, he joined the Board of Directors of Catalana de Gas y Electricidad, S.A. as 2nd vice-president; later he became sole vice-president in 1920, and finally chairman in 1923, a position he held until his death in 1945. To sum up, 32 years of collaboration existed between the gas company and Eusebio Bertrand Serra.

Eusebio Bertrand's mindset can perhaps be intuited from some paragraphs taken from a speech he gave in 1930 at the First Technical Congress of Textile Industries held in Barcelona:

Spain, unfortunately, distinguishes itself from other countries by a condition that is truly shameful and extremely damaging. In all the nations of the world, without exception, the citizens are the ones who most defend everything that concerns their homeland. In our country, on the other hand, we are the worst enemies of our land, and so it turns out that, in terms of the cotton textile industry, inside and outside Catalonia, every opportunity is taken when they are not sought, to make derogatory comments on the alleged backwardness of our industry.

... the industrialist is a hero here, as are the directors, because of how industries in our country must develop. It would be difficult to find in England and the United States a director capable of running a factory of the ordinary type that we have here.

The great engineer Heinemann, a well-known businessman, said recently in a conference he gave at the Ritz Hotel in Barcelona, that the future of the world rested on three pillars: Finance, Administration and Technology, and the memory of those words is what makes me think that at this time I could never have a better opportunity to tell you that, in my opinion, industry also rests on three pillars, and these are: Capital, Technology and Work.²⁸⁶

Francisco Bastos' Hydroelectric Project

Bastos' business reasoning was quite simple: if Barcelona had a market with a large energy demand, and the electricity available in the city was expensive, an opening existed for new suppliers. In order to compete, it was necessary for the sum of investments needed to install the waterfalls and hydroelectric power

286. Aliberch (1952), pp. 53-67.

Table 35. Francisco Bastos' project. The hydroelectric exploitation of the Ésera River (1911)

Waterfall	Height (meters)	Flow (liters/second)	Power (HP)	Canal length (meters)
El Run	140.00	15,000	21,000	8,862
Puente Argoné	40.79	15,000	6,118	3,527
Campo	45.00	15,000	6,750	4,260
Santaliestra	130.00	15,000	19,500	8,837
Perarrúa	35.50	15,000	5,295	3,892
TOTAL	391.29	15,000	58,663	29,378

Source: Bastos (1911), p. 13.

stations and to build the transmission lines to Barcelona to be cheaper than investing in the latest model of thermal power plant, which did not have to assume the cost of the transmission line. In terms of operating costs, the advantage would always be in terms of the raw material available for hydropower, since water was free of charge, which was not the case for the coal used in thermal power plants. However, the high cost of depreciation of the investment had to be taken into account. Bastos reflected: “when a period of a fight to the death arises, the waterfall, if it is not amortized during this period, survives, always in abnormal conditions within the business, but nonetheless it survives; a steam-based installation, however, cannot stop paying for coal and so must perish”.²⁸⁷

According to Bastos, in order to build a group of competitive waterfalls, they had to be close to one another, connected to roads already built and in service, and provide at least 30,000 HP of power at low water levels. In addition, in the case of supplying Barcelona, where the waterfalls were far away, they had to be very cheap and for this reason they had to be very high, with a short canal length and significant flow volume, with a geological structure of the land such that they crossed the canal very favorably. The group of waterfalls on the Ésera basically fulfilled all the conditions that he himself had stipulated to make the electricity they could generate for the Barcelona market competitive and of interest. The road from Graus to Benasque was being completed and the famous Ventanillo pass, which had traditionally made access along the length of the Esera River difficult, had finally been opened up (Table 35).

287. Bastos (1911).

The whole system consisted of five falls, which Bastos described in the following words: “All the waterfalls are located along the road built from Graus to Benasque. Starting from the highest part of the river, there are the falls of El Run, with its canal at an elevation of approximately 881 meters above sea level; immediately after, the falls of Puente Argoné, always on the same road, is located at an elevation of 711 meters above sea level. There is then a 5-kilometer solution of continuity and the Campo waterfall starts at 598 meters above sea level and the Santaliestra waterfall, at 548 meters above sea level, continues without interruption. The small Perarrúa waterfall, following the previous one, is at an elevation of 411 meters”. The distance between the two waterfalls at either end of this chain was 35 kilometers by road.

The initial budget to develop the El Run and Santaliestra falls was 15 million pesetas, of which 48% corresponded to the waterfalls themselves, 37% to the transmission and distribution lines, and the rest to other concepts. According to Bastos’ calculations, with assumptions of sales, costs, prices and financing, the return on capital could be as high as 14.83% per annum.

The strategy to secure the concessions was quite clear. In 1908-1909, two residents of Zaragoza requested and obtained the El Run and Perarrúa concessions; in 1910, Bastos and López Tudela appeared and managed to obtain them, later requesting the remaining three (Puente Argoné, Campo and Santaliestra) at the end of 1910. In April of 1911 they were on the market with a brochure explaining their hydraulic project, with which they managed to interest the Sociedad Catalana para el Alumbrado por Gas and M. Bertrand e Hijo, and so in October of 1911 the Sociedad General de Fuerzas Hidroeléctricas was constituted, to which they contributed the two concessions they’d obtained and the three concessions whose applications were in process and this was estimated as a 24% stake in the company, valued at 2,500,000 pesetas.

However, the Sociedad Catalana para el Alumbrado por Gas and M. Bertrand and Son also took their precautions. Thus, they indicated that they would deliver 85% of the agreed shares to Bastos and López Tudela (4,250 out of 5,000) immediately and the rest when work began on the Puente Argoné (300 shares), Campo (375 shares) and Perarrúa (75 shares) falls (Table 36).

The First Steps

The Sociedad General de Fuerzas Hidroeléctricas (SGFH) held its first Board and General Meeting in January of 1912 in which it appointed Eusebio Bertrand Serra as its new chairman, due to the death of his father; Álvaro M.^a Camín was named

Table 36. Sociedad General de Fuerzas Hidroeléctricas. Contributed concessions (1911)

Concept	El Run	Puente Argoné	Campo	Santaliestra	Perarrúa
08-1908	—	—	—	—	First concession
08-1909	First concession	—	—	—	—
06-1910	Sale to Bastos/López Tudela	—	—	—	Sale to Bastos/López Tudela
12-1910	—	Application for concession by Bastos/López Tudela	Application for concession by Bastos/López Tudela	Application for concession by Bastos/López Tudela	—
10-1911	Contribution of the five Bastos/López Tudela concessions to the Sociedad General de Fuerzas Hidroeléctricas				
Value of contribution	1,000,000 pesetas	200,000 pesetas	250,000 pesetas	1,000,000 pesetas	50,000 pesetas

Source: NFHA.SGFH. *Copia escritura de constitución de la Sociedad General de Fuerzas Hidroeléctricas*. Barcelona: Notario Gallardo (28-10-1911) and by the author.

its vice-president, and Vicente Ferrer as its secretary. Immediately after, negotiations began with the Central Catalana de Electricidad to draw up a contract for its Vilanova plant to act as a backup power plant for the waterfalls, and for SGFH to supply it with electricity at competitive prices for distribution in the city.

The concept of a backup power station was interesting, because it gave an advantage both to Barcelona Traction, which could make use of the Paralelo power station (of the former Compañía Barcelonesa de Electricidad), and to the Sociedad Catalana para el Alumbrado por Gas, which had the Vilanova power station of the Central Catalana de Electricidad. On the other hand, for Energía Eléctrica de Cataluña it was a problem, given that the Compagnie Générale d'Electricité, having been unable to take over the Compañía Barcelonesa, did not have a backup plant and would therefore have to make an additional investment in building one, and could not begin to prepare the market from a thermal power station already operating in Barcelona, while the waterfalls were being built. Energía Eléctrica de Cataluña built its reserve power station on the left bank of the Besòs, and called it the Sant Adrià power station.

In short, the scheme was similar in some ways, and only in some ways, to that of renewable energy today; it was assumed that hydropower would work but just in case, an idle, standby power station was kept available if necessary, thereby

doubling the costs. However, the energy normally used was the cheapest and the energy held in reserve for contingencies was the one that represented the highest production costs.

Also in these first councils of the SGFH, the realization of plans and projects and the processes of expropriation were started, with visits to the terrain, and Diego Mayoral Estremiana²⁸⁸ was appointed as chief engineer of the construction.

By January of 1912 some shares had already changed hands, Bastos and López Tudela had sold theirs and the Bertrand family had bought and already controlled 46% of the company. In short, from the moment the hydroelectric issue had been discussed for the first time by the Board of La Catalana in July of 1911, six months had passed and everything was already in motion.

The Appearance of Catalana de Gas y Electricidad

1912 was a very complex year, full of events and eventualities that shaped the future for many years to come: Compagnie Générale d'Electricité tried to merge the Energía Eléctrica de Cataluña with the Sociedad Catalana para el Alumbrado por Gas; Pearson wanted to acquire La Catalana; Lebon decided to abandon the electric business in Barcelona and sell its share of the Central Catalana de Electricidad. Finally, and as a consequence of all these movements, a new actor appeared in an already long history: Catalana de Gas y Electricidad.²⁸⁹

The feelings of the moment were perhaps reflected in the editorial *Electrificación de Cataluña* ("The Electrification of Catalonia"), published in 1912, which stated: "But must we trust that all this, which is the very future of Catalonia, will be done by the capital and intelligence of foreigners? How long will our businessmen sleep peacefully waiting for the spur of French, Belgian or Swiss capital, brazen or disguised, before they make a move or are made to move?".²⁹⁰

Pierre Azaria took the initiative; it was evident that when he designed his project for Catalonia and created Energía Eléctrica de Cataluña (EEC) he had not

288. NFHA.SGFH. *Consejo de Administración* (04-01-1921 and 26-02-1912). Diego Mayoral Estrimiana was a civil engineer who studied at the Zurich Polytechnic. He participated in the Technical Council of Electricity of the Instituto Nacional de Industria (INI) (1942), chaired the Public Works Board, and finished his professional activity as vice-president of the Board of the Empresa Nacional de la Electricidad (Endesa).

289. Fàbregas (2012g), pp. 52-59.

290. "Electrificación de Cataluña". *Revista Catalana*, January 20, 1912, n.º 224, pp. 33-35.

foresee the complications that would arise from the appearance of Barcelona Traction (BT). He had no standby power plant or distribution network; he had tried to buy the Compañía Barcelonesa de Electricidad (CBE) from AEG, but BT had beat him to it. It was also the first international project of the Compagnie Générale d'Electricité (CGE) and he could not afford to fail.

In May of 1912, a representative of Banque Perier et Cie. of Paris, M. Marchal (son-in-law of Ferdinand Perier), visited José Mansana at his office in Barcelona to explore the potential interest of a joint venture between EEC, SGFH and the Sociedad Catalana para el Alumbrado por Gas (SCAG). The Banque Perier et Cie. was the majority shareholder of Banca Arnús, in which José Mansana had been a member of the Board of Directors since its creation in 1910.

The time was right and Azaria and Mansana reached an agreement on June 22, 1911, subject to ratification by the Boards of Directors, which established the basis for the merger of Energía Eléctrica de Cataluña and the Sociedad General de Fuerzas Hidroeléctricas with the Sociedad Catalana. But the Board of Directors of the company, in August 1912, requested: "that before the Board of Directors makes a decision or takes any resolution on this matter, an attempt be made to reach a definitive agreement with the Compañía Riegos y Fuerzas del Ebro, so that if the proposed merger with the Energía Eléctrica de Cataluña is reached, it may be certain that there will be no struggle between the two companies that would remain in existence".²⁹¹ An agreement of this kind with a figure like Pearson was impossible, so the issue disappeared from the agenda, and other alternatives began to be studied: Why not directly absorb the Sociedad General de Fuerzas Hidroeléctricas?

But Lebon opened another front of negotiation when it decided to withdraw from the Central Catalana de Electricidad (CCE) and offered to sell its 50% share to the Sociedad Catalana. The CCE operated the Vilanova plant in Barcelona, where thermal electricity was produced from coal, but which, with the SGFH hydroelectric projects in which Lebon did not participate, stood idle only as a reserve power station. To participate only in this part of the business was perhaps not sufficiently interesting, and to participate in the hydropower business was not in the strategic line of Lebon, which had been adding power plants to its gas operations, but always thermal power plants, never hydraulic ones.

The acquisition involved a significant outlay but added flexibility to possible future strategies, as Mansana indicated to the Board in June of 1912: "this would

291. NFHA, SCAG. *Consejo de Administración* (16-08-1912).

greatly facilitate the combinations that can be made with the Sociedad General de Fuerzas Hidroeléctricas and with the other companies that intend to run the electricity business".²⁹² The final decision was approved in August, and the corresponding deed was signed in November 1912, at a value of 2.9 million pesetas.

It is clear that the negotiation with the Compagnie Générale d'Electricité was in the background of these statements by Mansana. Obviously the Board agreed to continue the negotiations, which were quick, as the two managers of the Central Catalana de Electricidad had already reached an agreement on the awarding of contracts on July 8, and finally, on August 3, 1911, the Board of Directors of La Catalana agreed to buy 50% of the Central Catalana de Electricidad from Lebon.

One can imagine the situation in the summer of 1912, everyone rushing around and fighting for success or survival. Pearson had already created his own companies and started his project; he had taken control of the Compañía Barcelonesa de Electricidad, and made a pact with the very important AEG for its departure from Barcelona; he had also acquired all the small and medium-sized electricity companies in the area, which saw in their sale to Barcelona Traction the solution to avoiding a fierce struggle over competition and territory, shielded by the image of Pearson's companies as a powerful multinational.

Energía Eléctrica de Cataluña, for its part, was looking for a partner to compete in the local market, and the arrival of Barcelona Traction must have surprised it, without it being able to withdraw from a project designed with other bases. It had tried to make a pact with the Compañía Barcelonesa de Electricidad and had failed because of the interference of Barcelona Traction, and had then tried to reach an agreement with the Sociedad Catalana para el Alumbrado por Gas. But this last attempt would not be successful either and finally the Compagnie Générale d'Electricité had no choice but to agree with the omnipresent Barcelona Traction for it to become a major shareholder in Energía Eléctrica de Cataluña.²⁹³

In the complex situation at that moment, practically the only significant company left facing Barcelona Traction was the Sociedad Catalana para el Alumbrado por Gas, but this had also changed. SCAG was now active in the hydroelectric business through the Sociedad General de Fuerzas Hidroeléctricas, and in thermal electricity in a significant way, having acquired Lebon's stake in the Central

292. NFHA, SCAG. *Consejo de Administración* (01-06-1912).

293. The operation was executed on February 1, 1913, through the acquisition by Spanish Securities of 49% of the shares of Energía Eléctrica de Cataluña, which were subsequently transferred to Barcelona Traction, additionally subscribing for an option to purchase the remaining shares.

Table 37. Sociedad Catalana para el Alumbrado por Gas. Balance Sheets (1910-1912) (millions of pesetas)

Concept	1910	1911	1912	Increase (%)
Buildings and land	1.8	1.8	2.7	37
Gas Barcelona	18.2	18.1	18.2	—
Gas Sevilla	3.8	3.9	3.9	—
Alquitrán Montgat	—	—	0.1	—
Electricidad Barcelona	3.0	3.0	11.2	273
TOTAL FIXED ASSETS	26.8	26.7	36.0	34
Active working capital	13.1	18.5	33.2	153
TOTAL ASSETS	39.9	45.2	69.2	73

Source: NFHA.SCAG. *Balances presentados a las Juntas Generales de Accionistas*; NFHA.CGE. *Balances presentados a las Juntas Generales de Accionistas 1912-1913*.

Catalana de Electricidad, and continued with its traditional gas activity in Barcelona and Seville (Table 37).

The efforts made by the Sociedad Catalana financially and in terms of growth so as not to be left behind were very important. Over the course of the company's history until 1910 — during its first 67 years of existence — it had accumulated assets of some 40 million pesetas, while from 1910 to 1912 an additional 30 million pesetas were added, which represented practically doubling the company's assets in just two years. Opportunities opened up, but risks were also taken, and the efforts made financially and in terms of growth were evident.

In a short time, the Sociedad Catalana was practically the only opposition left to face Barcelona Traction's grandiose policy of seeking a regional solution to all electricity issues by concentrating them in one hand. At some point, according to Barto Roig²⁹⁴, Pearson and Mansana met. Pearson offered to buy all the shares of the Sociedad Catalana para el Alumbrado por Gas to complete his efforts to totally control the region, but it seems that Mansana put conditions on this, one of them, that La Catalana would occupy the presidency of the operating company in Spain

294. "An offer was made to Catalana de Gas y Electricidad, S.A. Dr. Pearson personally offered its chairman, Mr. Mansana, the acquisition of all of its shares. Mr. Mansana stipulated as a condition that he be appointed president of Riegos y Fuerza del Ebro. This condition was not accepted by Pearson". Roig (1970), p. 280.

of the multinational group, the company called Riegos y Fuerzas del Ebro, in other words, its management. Pearson refused and no agreement was reached on what would otherwise have changed history, this history.

Given the situation, the Sociedad Catalana had only one alternative left, which was to face Barcelona Traction. In order to do this, it immediately began to study the operations that would allow it to better position itself in the highly competitive context of the moment. The company moved very quickly. In August 1912, it became disenchanted with the merger with the EEC; in September, the usefulness of a possible takeover of the SGFH was considered; in October, the Board of Directors approved it; and in November, Lebon's participation in the CCE was acquired and an extraordinary General Shareholders' Meeting was called, which would mark the beginning of a new line of action.

The General Meeting of Shareholders held on November 12, 1912 was very important²⁹⁵, as it decided to change the name of the Sociedad Catalana para el Alumbrado por Gas to Catalana de Gas y Electricidad, more appropriate for the activities that the company was already carrying out. The first name had remained in use for 69 years (1843-1912), the second would last 75 years (1912-1987).

At the industrial level, the important decision was made to absorb the Sociedad General de Fuerzas Hidroeléctricas, valued at 4,100,000 pesetas, which would be paid for in new shares of the company and thus the concessions and rights of the waterfalls of the Esera River would be integrated into the parent company. On a financial level, an incredible increase in the share capital was agreed upon, from 12,375,000 pesetas to 40,000,000,000 pesetas, more than tripling it.

The capital increase of 1912 was proposed in several tranches, one first to distribute the bonus shares to the former shareholders in the proportion of 3x2, i.e. to increase the value of the share capital without making additional contributions. Another tranche of the increase, valued at 4,100,000 pesetas, was intended as payment to the shareholders of Sociedad General de Fuerzas Hidroeléctricas for their contribution of assets and liabilities to the company. Finally, a third tranche was defined at the disposal of the board in case acquisitions were to be made in the near future and paid for with shares in the company.

All these movements of shares altered the balance of power that existed in the company, already known as Catalana de Gas y Electricidad, where approximately

295. NFHA, SCAG. *Junta General de Accionistas* (12-11-1912).

4% of the shares were controlled by the Board and 5% by the managing director, while the rest were very diluted among the company's shareholders.

The entry of Eusebio Bertrand Serra through the exchanges of shares mentioned above, as well as the Sociedad Catalana's own share purchases in the market, supported by the entry at the same time of Francisco Bastos and Eugenio López Tudela, raised another situation, in which Bertrand Serra was gradually emerging as a new strong man in the company. He was appointed vice-president of the Board the following year and then chairman in 1922, a position he held until his death in 1945, when his son Juan Bertrand Mata replaced him for another 20 years, while the family chose Pere Duran to continue its work in Catalana de Gas y Electricidad. In short, at a time of change, a businessman with drive and a certain dedication to politics through the Lliga Regionalista, assumed the responsibility of continuing to advance one of the country's most traditional companies (Table 38).

Before the arrival of Eusebio Bertrand, the company's primary shareholder was the managing director, José Mansana. Subsequent to the above transactions, the primary shareholder was Eusebio Bertrand. Closer examination will have to be made of the relationship between Bertrand and Mansana, but at any rate, it was the latter who, in search of a capitalist partner for the Sociedad General de Fuerzas Hidroeléctricas, facilitated the entry of the Bertrand family.

Thus, at the end of 1912, the now Catalana de Gas y Electricidad was a different company, which had absorbed the Sociedad General de Fuerzas Hidroeléctricas,

Table 38. Catalana de Gas y Electricidad. Equity stakes (1911-1912)

Shareholder	General Shareholders' Meeting 1911	General Shareholders' Meeting Early 1912	General Shareholders' Meeting Late 1912
Members of the Board	4.2%	4.3%	4.0%
José Mansana	4.8%	5.1%	4.6%
Traditional Total	9.0%	9.4%	8.6%
Eusebio Bertrand	—	3.7%	7.3%
Close to E. Bertrand	—	—	0.9%
Bastos / López Tudela	—	—	4.9%
New Shareholders Total	—	3.7%	13.0%
SUM	9.0%	13.1%	21.6%

Source: NFHA.SCAG. *Junta General de Accionistas* (29-04-1911, 29-04-1912 and 12-11- 1912).

had integrated the assets of the Central Catalana de Electricidad, and had begun work on the Seira plant in the Pyrenees of Huesca. With all this, Catalana de Gas y Electricidad was already a very important company. Xavier Tafunell indicates that in 1913 it was the seventh largest industrial company in Spain by stock market capitalization, and that in 1917 it would be the sixth industrial company in Spain by volume of net assets.

The Board and the New Situation: Francesc Cambó

Some of the consequences of the profound changes experienced by Catalana de Gas y Electricidad at the end of 1912 appeared the following year; one of them, evidently important, was the adaptation of the Board of Directors of the company to the new situation of the shareholders and the surroundings.

And so, for the first time in a long time, new members of the Board of Directors were appointed. Until then, in the years of the board's existence (1906-1912), no new members had been appointed, not even to replace the six board members who had died in the period (Table 39).

Table 39. Catalana de Gas y Electricidad. Board of Directors (14-10-1913)

Name	Position
Álvaro M. ^a Camín López	Chairman
Juan Desvalls Amat, Marquis of Alfarrás	1 st Vice-President
Virgilio M. Mora Molins	Member of the Board
Manuel Porcar Tió	Member of the Board
Pablo Torras Pascual	Member of the Board
Raimundo Puig Durán	Member of the Board
Eusebio Bertrand Serra	2 nd Vice-President
Eugenio López Tudela	Member of the Board
Francesc Cambó Batlle	Member of the Board
José Mansana Terrés	Member of the Board Managing Director
Adolfo Oller Bosch	Member of the Board and Secretary

Source: NFHA.SCAG. *Junta General de Accionistas* (28-04-1906) and *Consejo de Administración* (07-06-1906); NFHA. CGE. *Juntas Generales de Accionistas y Consejos* (1912-1913).

The new board members were Eusebio Bertrand Serra and Eugenio López Tudela, from the former Sociedad General de Fuerzas Hidroeléctricas, and Francesc Cambó, a regionalist politician.

In its own organization, the Board appointed two vice-presidents, the first vice-presidency being granted to the Marquis of Alfarrás, an advisor with a long history in the company, and the second vice-presidency to the leader of the new entrants, Eusebio Bertrand Serra. Obviously, in all this situation of change, Chairman Camín and Managing Director Mansana continued in their positions.

When Chairman Camín died in 1919, he was replaced by the first vice-president, the Marquis of Alfarrás, who died in 1922, and was replaced at that time by Eusebio Bertrand Serra, who would remain in office until 1945, for more than twenty years.

The entry to the Board of Francesc Cambó, a very well-known figure, deserves comment. At that time he was a member of the Cortes in Madrid, and was linked to Eusebio Bertrand Serra given that both were among the founders of the Lliga Regionalista (1901), and to José Mansana, through coinciding in the creation of the Banca Arnús (1910), where they were both members of its Board of Directors.

Cambó's presence on the Board lasted for ten years, from October 14, 1913 to October 27, 1923, when he resigned following the decree of General Primo de Rivera which limited former ministers of the Crown from participating in companies as board members, advisors or lawyers.²⁹⁶

During those years Cambó was deputy (1912-1923) and Minister of Public Works (March 22, 1918 - November 9, 1918) in the Maura Government, where he incorporated Francisco Bastos to work on the supply and logistics of coal from Asturias, as mentioned above. In 1919, he tried to establish a Statute of Autonomy for Catalonia as an advancement and overcoming of the existing Mancomunidad de Provincias and failed, a matter that clearly damaged his political image, and which led Niceto Alcalá-Zamora to pronounce the famous phrase in reference to Cambó, that he wanted to be both the Bolivar of Catalonia and the Bismarck of Spain.

As a result of the World War I, the victorious powers tried to appropriate all the German assets they could lay their hands on. In order to protect the Buenos Aires electricity company²⁹⁷, owned by German interests, on the advice of

296. *Real Decreto de la Presidencia del Directorio Militar de 12 de octubre de 1923.*

297. The electricity concession for Buenos Aires had been obtained by the Compañía Alemana Trasatlántica de Electricidad (CATE) in 1907, with a duration of 50 years.

Cambó it was decided to make the company Spanish by creating the Compañía Hispano-Americana de Electricidad, known as CHADE (1920). Behind it were the interests of Sofina²⁹⁸ and therefore of Dannie Heinemann and Walter Rathenau's AEG.²⁹⁹ The Marquis of Comillas was appointed president, and Cambó himself, vice-president. After the death of the Marquis of Comillas, in 1925 Cambó was appointed president.

Appointed Minister of Finance (August 14, 1921 - March 8, 1922) in a new government of Antonio Maura, Cambó played a significant role in the fight against the tobacco smuggling of Juan March; he turned again to Francisco Bastos and appointed him director of the Compañía Arrendataria de Tabacos. At this point, when General Primo de Rivera established his dictatorship and dissolved the Cortes, Cambó retired, although he would reappear in the 1933 parliamentary elections.

He brought his experience in international finance and public administration to the Board of Directors of Catalana de Gas. An example is the following account from 1916, when the difficulties posed by World War I caused serious problems in the supply of material for new investments: "concerning the difficulties we have in receiving German pipeline for the waterfalls, as well as boilers from Switzerland for the thermal power station we are building in San Adrián de Besos, Mr. Cambó offered to make use of his good friendships to avoid all kinds of difficulties as much as possible".³⁰⁰

With these additions to the Board of La Catalana, the company became connected with Catalonia's finest industrial and political bourgeoisie, men of high cultural, political and human sensibility. In Catalonia there were only two groups left, the first a multinational with an inextricable financial network behind it, which eventually, after the Spanish Civil War, would collapse in resounding bankruptcy. The second, the most traditional public limited company in Catalonia, the only one that had resisted the multinational's challenge with firmness and character, the only one that had been contributing to the social fabric over a long period of 70 years, had the support of the country's most advanced bourgeoisie.

298. Sofina was the last important owner of the Barcelona Traction, the main victim of the company's bankruptcy declaration by Juan March in a Reus court.

299. He had inherited the presidency of AEG after the death of his father Emil Rathenau in 1915 (Emil was the founder of the Compañía Barcelonesa de Electricidad). Walter was Minister of Foreign Affairs of the Weimar Republic.

300. NFHA.CGE. *Consejo de Administración* (29-01-1916).

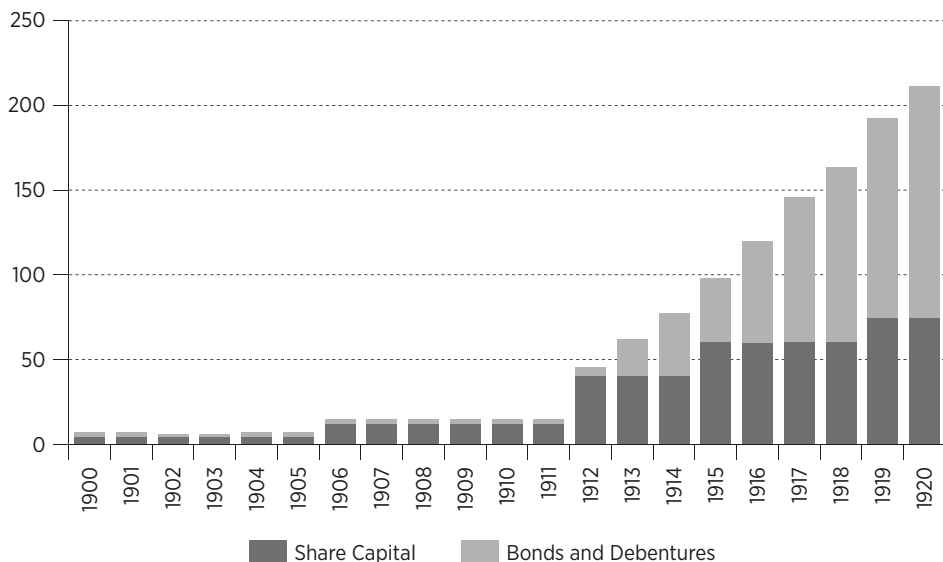
The Financial Effort

In the financial context, the evolution of the new investments in electricity and the growth in gas was significant and forced the company to constantly seek new financial resources, mainly from 1912 onwards (Graph 1).

Definitively, for the entire period analyzed (1900-1920), the need for new financial resources grew dramatically. The activity of electricity and even more so hydroelectric activity, demanded extraordinary investment, much more than the gas and thermal electricity industry of the time and in which the company had been active in recent years. Capital was multiplied 18 times, while the outstanding debt in bonds and debentures was multiplied 56 times, with the consequent deterioration of the proportion of the share capital in the total resources, which went through three very distinct periods:

- The first, from 1900 to 1905, in which capital represented between 64 and 67 % of total resources.
- The second, from 1906 to 1912, with a clear improvement in the situation, since the proportion of share capital was between 84 and 89 % of total resources, partly

Graph 1. Catalana de Gas y Electricidad. Financial resources (millions of pesetas) (1900-1920)



Source: NFHA.SCAG. *Juntas Generales* (1900-1912); NFHA.CGE. *Juntas Generales* (1912-1921) and by the author.

due to the capital increase in 1906 and 1912, and the significant improvement in the company's results from 1907 onwards.

- And the third, from 1913 to 1920, in which the situation deteriorated from the previous comfortable situation to percentages between 64 and 36 % in last year, despite the capital increases of 1915 and 1919. The evolution is undoubtedly based on the spectacular increase in investments (total assets rose from 100 million pesetas in 1913 to 268 million pesetas in 1920), as well as on the significant drop in earnings from 1916 to 1919, with losses in 1917 and 1918, the effect of the special situation of coal prices during World War I, a period during which no dividends could be distributed.

However, the company, with all these positive and negative points, managed to grow, increase its capacity and market, and maintain its position among the country's largest electricity companies at a particularly complex time strategically, the truly mass-scale introduction of electricity into the Catalan market, within a highly competitive and aggressive context difficult to endure.

The pressure on the financial resources of these years can perhaps be better evaluated if we consider that in the 20 years contemplated the company carried out four capital increases; after this period everything would be different, the next capital increase following that of 1919 was carried out in 1943, 24 years after the last operation of this type (Table 40).

Using basic information from Professor Gregorio Núñez Romero-Balmas on the capital and borrowings of Spanish electricity companies in the period 1905-1947, the above statements can be calibrated. In 1905, companies of the 19th century such as Lebon, CGE (at that time still known as the Sociedad Catalana para el Alumbrado por Gas) or La Barcelonesa de Electricidad still occupied the first places, with a new entrant, Hidroeléctrica Ibérica, founded in Bilbao by the engineer Juan Urrutia Zulueta in 1901.

Then came the years of Barcelona Traction Light and Power and its subsidiary Riegos y Fuerzas del Ebro, with CGE occupying third place from 1913 to 1935, a period of 22 years. There was also, but for a short time, Energía Eléctrica de Cataluña. Meanwhile, the electricity companies of the future were already beginning to appear in the ranking: Hidroeléctrica Española, Sevillana, Unión Eléctrica Madrileña, Electra de Viesgo and Fuerzas Eléctricas del Noreste. The Cooperativa de Fluido Eléctrico, later Compañía de Fluido Eléctrico, appeared when CGE entrusted it with the management of its electricity assets. Later, when CGE constituted Hidroeléctrica de Cataluña, it would absorb the Compañía de Fluido Eléctrico.

Table 40. Spanish electricity companies. Ranking (1905-1947)³⁰¹

Ranking	1905	1913	1924	1935	1947
1	Lebon	BT	BT	BT	H. Ibérica
2	Barcelonesa	Lebon	RyFE	RyFE	UE. Madrileña
3	H. Ibérica	CGE	CGE	CGE	H. Española
4	CGE	EEC	HPTE	CFE	BT
5	E. Chamberí	H. Española	EEC	H. Española	Sevillana
6	ERZ	Barcelonesa	H. Española	H. Ibérica	CGE
7	Alhemeyer	H. Ibérica	UE. Madrileña	UE. Madrileña	Fenosa
8	UE. Vizcaína	UE. Vizcaína	E. Viesgo	HPTE	E. Viesgo
9	E. Mediodía	Sevillana	Barcelonesa	EEC	ERZ
10	Elect. Supply	E. Chamberí	H. Ibérica	S. Alberche	CFE

Source: NÚÑEZ (1995), pp. 78-79 and by the author.

In short, during the 42 years covered by the information presented, practically the first half of the 20th century, Catalana de Gas y Electricidad was among the top six electricity companies in the country in terms of the volume of financial resources managed.

Acquisitions, Coal and Seville

New Acquisitions: La Propagadora del Gas and La Energía

Due to the efforts it made to modernize its gas facilities in Barcelona, Catalana de Gas y Electricidad (CGE) in 1913 still showed dynamism and growth. At the 1914 General Meeting it was said: “Despite the competition from electricity, gas consumption is growing every day, thanks to the new appliances invented, which intensify light and reduce its cost. In the last fiscal year, which we are now reviewing, this increase consists of nine thousand seven hundred and eighty installations,

301. The basis of the ranking is the amount of capital and bonds. The abbreviations used are the following: BT (Barcelona Traction Light and Power), CFE (Cooperativa/Compañía de Fluido Eléctrico), CGE (Catalana de Gas y Electricidad), EEC (Energía Eléctrica de Cataluña), ERZ (Energía Eléctrica Reunidas de Zaragoza), HPTE (Hispano Portuguesa de Transportes Eléctricos), RyFE (Riegos y Fuerzas del Ebro).

doubling that of the previous fiscal year and tripling the average increase over the last five years”.³⁰²

But in order to continue growing, the strategy of Barcelona Traction of acquiring as many small companies as possible had to be adopted in order to avoid their passing to the main competitor. Mansana saw this clearly and proposed to the Board at the beginning of 1913: “to widen the radius of action of the company, combining our production to connect several towns by means of pipes that carry gas under pressure, it would be possible with very few gasworks to supply gas to several towns and to increase in an important way our production and therefore our businesses”.³⁰³

It was decided to acquire La Propagadora del Gas, for 1,800,000 pesetas, with gasworks in Terrassa, Badalona and Premià de Mar, and with distribution in several additional municipalities of the Maresme. And also La Energía, with gasworks and electricity plants in Sabadell, for 2,992,000 pesetas. The two acquisitions were interesting, that of La Propagadora because it was the company that had been created to install gas lighting in Gràcia, which later sold the gasworks to Lebon and had begun these new activities, introducing at a European level the concept of supplying several municipalities from a single gasworks. And the case of La Energía, because it combined gas and electricity, arising from the integration of the José Mansana gasworks in Sabadell with the Juan Brujas electricity plant, exactly where the Museo del Gas of the Naturgy Foundation would be installed in 2011.

With this operation, Catalana de Gas y Electricidad ended up having gasworks in Barcelona, Badalona, Premià, Sabadell, Terrassa and Seville; and thermal power plants in Barcelona, Sabadell and Seville.

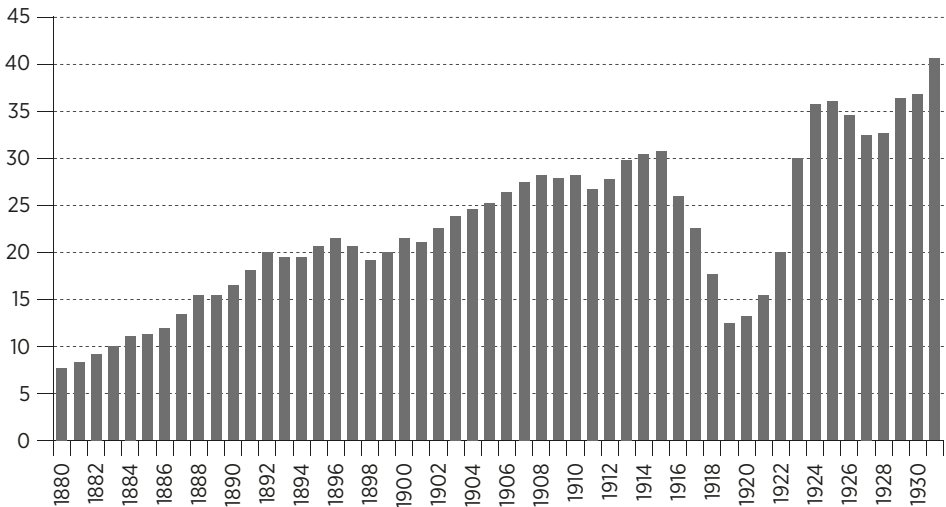
The Coal Question

Coal, its price, quality and logistics, was always a very important question for the gasworks, which depended on it to operate their production facilities. Good quality coal allowed an adequate yield of gas production per ton, good combustion gas and good luminosity, and also produced by-products, basically coke, of high value. For many years, coke contributed very important sums to the companies’

302. NFHA.CGE. *Junta General de Accionistas* (29-04-1914).

303. NFHA.CGE. *Consejo de Administración* (14-01-1913).

Graph 2. Catalana de Gas y Electricidad. Barceloneta Gasworks. Gas produced (millions m³) (1880-1931)



Source: PFHA.SCAG. *Bernardo Ten. Notes from 1875 to [...] (1875-1932).*

revenues, and sometimes even became more significant than gas itself. The price of coal was another notable point, as was its logistics, i.e. whether it was easy to find on the market to ensure the continuous supply needed to maintain a balanced and smooth gas production. Most of the power plants also produced electricity from coal and had a similar problem, a dynamic the new hydroelectric installations could avoid (Graph 2).

The stability in the supply of coal and its prices, as well as the progressive expansion of the Barceloneta gasworks, had allowed continuous growth in the production of gas of a reasonable quality, supported by Barcelona's continued development and the positioning of the company in the market in its ongoing competition with Lebon. The introduction of thermal electricity in the last five years of the 19th century had led to a slight decline, but it was quickly overcome by the new uses of gas and the clear competitiveness of its prices in relation to electricity. The great competition, hydroelectricity, would not make its effects felt until a few years after the commissioning of the first plants of this type in the period 1913-1914.

With the outbreak of the World War I (1914-1918), the question of coal entered a spiral of very significant difficulties that forced many companies into truly extreme conditions. In 1915 the situation was already serious according to the explanations

given to the General Shareholders' Meeting: "...one realizes the difficulties encountered during the year of nineteen hundred and fifteen for the supply of coal, because the Spanish market is closed to us, because all its production has already been allotted; because of the reduction and high demands of the English market and because operations with the American market are difficult and risky. Because of the needs of the war, the prices of coal and freight have risen excessively, having reached unbelievable prices".³⁰⁴

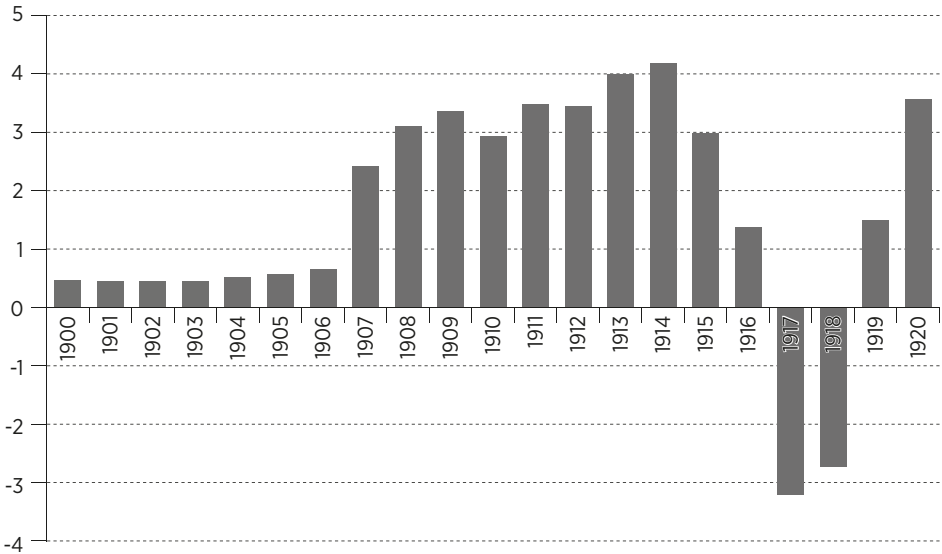
The following year, however, the situation grew worse, with prices for coal rising threefold and freight prices sixfold, due to a lack of ships and supplies. At the end of 1916, there was already talk at the Spanish level about the possibility of a temporary suspension of the gas service, due to the impossibility of obtaining the necessary coal.

In 1917, the pressure of the pipeline networks had to be reduced and the service was suspended for a few hours and days, with the consequent reduction in income from the sale of gas and by-products, which led to revenue losses, and the distribution of dividends to shareholders had to be stopped. The following year began badly, with huge quantities of firewood having to be used in the absence of coal³⁰⁵, and the economic losses continued, although the entry into service of the Seira power station in the Pyrenees mitigated the situation in the second half of the year. The end of World War I made it possible for things to return to normal in 1919 regarding coal and hydroelectric power, and to again return to making profits. Even so, not everything was normal. It was also the year of the La Canadiense strike. And while economic performance was picking up due to the normalization of coal prices, availability continued to be a problem. While in 1915 the Barceloneta gasworks had produced 30 million cubic meters of gas, in the following years production began to fall to only 12 million cubic meters in 1919, a reduction of 60% in 4 years. Subsequently, the situation began to improve until things eventually returned to normal in 1923, when the 30 million cubic meters of gas that had been produced a few years earlier was again reached. A period of continued growth then followed until the Spanish Civil War in the 1930s (Graph 3).

304. NFHA.CGE. *Junta General de Accionistas* (30-05-1916).

305. Bernardo Ten states: "1917. In November, the ovens were loaded with wood for lack of coal", and he continued, "1918. Throughout this year, very little Spanish coal has been loaded; instead, a lot of lignite, *orujo* and firewood has been loaded." During the period from December 1, 1917 to December 31, 1918, 62,192 tons of firewood were distilled. PFHA. SCAG. Bernardo Ten. *Notas desde el año 1875 al...* (1875-1932)

Graph 3. Catalana de Gas y Electricidad. Damages and Profits³⁰⁶ (millions of pesetas) (1900-1920)



Source: NFHA.SCAG. *Juntas Generales* (1900-1912); NFHA.CGE. *Juntas Generales* (1912-1921) and by the author.

Gas and Electricity in Seville

Work to modernize the Seville gasworks and install a thermal power plant to produce electricity and compete with the Compañía Sevillana de Electricidad had begun in 1910, but due to different circumstances it could not be inaugurated until July of 1914. However, the competition must have been very tough, as in about three years matters were already evolving towards the search for a model of a less damaging relationship between Catalana de Gas y Electricidad and La Sevillana.

Mansana in 1917 explained to the Board of Directors: “the negotiations with the Compañía Sevillana de Electricidad in order to reach an agreement by both companies on the operation of supply to private customers in that city. As a favorable result of those negotiations, he informed the Board of the agreement made between that company and our company. The main purpose of this agreement is to make it possible to work together in order to avoid unnecessary expenses for both companies. The aim is not to impose onerous conditions on the public, but rather to ensure as much as possible satisfactory electricity service, without the

306. “Damages and profits” is approximately equivalent to the current concept of EBITDA, i.e. earnings before interest, taxes, depreciation and amortization.

two companies having to cause each other mutual damage or perhaps ruin similar to what has occurred in other capitals”.³⁰⁷

But, despite the agreements, there was an important element that was difficult to resolve, the Sociedad Catalana did not have a supply of hydroelectricity in Seville, and in the following years this would be the basis for the activity and competition in that city. Finally, in 1920, Catalana de Gas y Electricidad decided to quit the game, negotiating with La Sevillana the lease of all its electricity installations, as well as the contracts with customers for a period of 20 years.³⁰⁸ Left out of the agreement were the thermal power plant and substation installed in the headquarters of Calle Rivero de Seville, as well as all the activity in the manufactured gas sector, where the company would continue to produce and distribute this energy on a continuous basis.

The Period of Important Work

The development of Catalana de Gas y Electricidad’s electricity business in these years involved the big project, the most emblematic of all the projects designed by Francisco Bastos: the El Run falls in Seira and the transmission line to Barcelona, as the central axis, but also the development of new falls below Seira, such as Puente Argoné and Campo. Likewise, efforts were made to obtain new concessions for hydraulic development by being active in the market for this type of rights, also in other river basins. And additionally, using its Pyrenees-Barcelona electricity connection, to take advantage of the electricity of other independent producers in these areas to improve the load on the transmission line and the impact on the final market with more energy, without having to build the applicable falls. Within this framework, the “theoretical” back-up plant in Barcelona, the Vilanova plant was too small, therefore, the project for a new thermal power plant in Barcelona was developed, and Vilanova began to be thought of more as a transformer station close to the distribution and customers.³⁰⁹

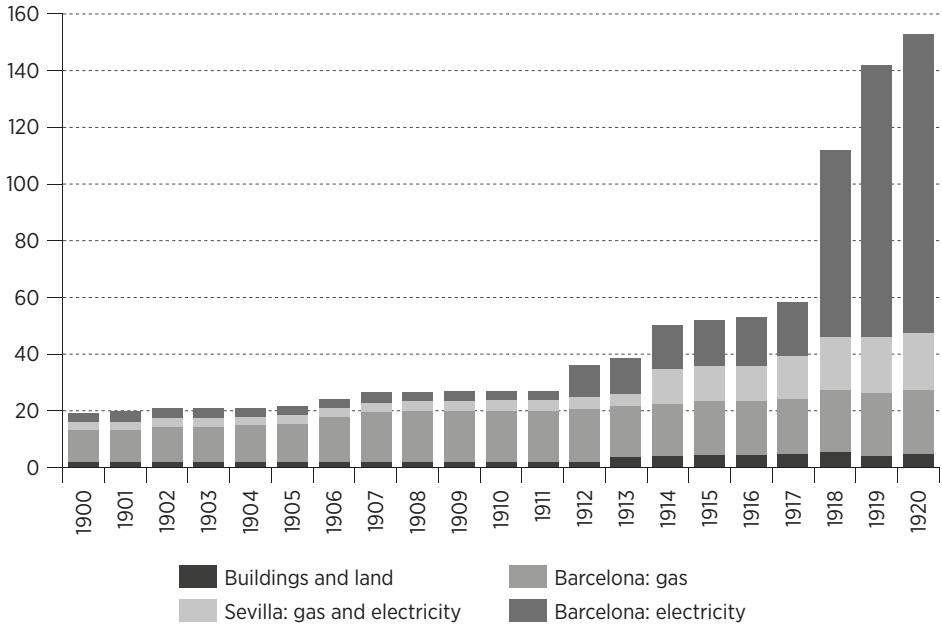
The company made significant investments in these years; the size of the sums involved in hydroelectric activity was of a very different scale than those in gas or

307. NFHA.CGE. *Consejo de Administración* (03-03-1917).

308. NFHA.CGE. *Consejo de Administración* (21-12-1920).

309. Fàbregas, (2012g), pp. 72-84.

Graph 4. Catalana de Gas y Electricidad. Gross tangible fixed assets by activity (millions of pesetas) (1900-1920)



Source: NFHA.SCAG. *Juntas Generales* (1900-1912); NFHA.CGE. *Juntas Generales* (1912-1921) and by the author.

the calmer thermal electricity, but the company acted decisively. While in the period 1900-1920 the assets in the gas sector in Barcelona were multiplied by two, the assets in the electrical activity in Barcelona in the same period were multiplied by 35, which resulted in the company being eight times larger by the size of its assets in 1920 than at the beginning of the century (Graphic 4).

The Power Plant of Sant Adrià (1917)

Only six months after its constitution, Catalana de Gas y Electricidad had already developed its strategy: to build the Seira waterfall and the transmission line to Barcelona. In its analysis, the Vilanova plant was deemed too small to start opening up the market during the period before the arrival of hydroelectricity, expected within a few years. In addition, in 1912, Energía Eléctrica de Cataluña had already begun work on a new thermal power station on the left bank of the mouth of the Besòs River. In April of 1913, it was clear that the Vilanova power station could not be enlarged due to lack of space, so it was decided to build a new thermal power station by acquiring land of about 300,000 square meters on the right bank of the mouth

of the Besòs River, in the part of the municipality of Sant Adrià del Besòs bordering Barcelona, between the river, the Camp de La Bota, and the railway tracks and the sea, where the construction of a new thermal power station, called Sant Adrià, was planned. In July, the Swiss company Oerlikon had been commissioned to deliver two turbochargers of 6,000 kilowatts each with all the condensing units, for 956,500 Swiss francs.

The start of World War I, on July 28, 1914, brought the race to a halt. The construction of the plant was to be carried out by a German company for 1,350,750 German marks, and the Board acknowledged: "Since the declaration of the European War, the construction of San Adrian has been suspended".³¹⁰ Finally, in November of 1915, the project was commissioned to a company in a neutral country, Switzerland's Maillart & C^o in Zurich, which had difficulty transporting the boilers it had built in Switzerland to Barcelona in 1916. In April of 1917, the plant was put into operation, albeit with a single boiler room and generator set. By April of 1918, it was able to carry out its work as the hydroelectric system's backup power station.³¹¹

Oerlikon generating sets and Westinhouse-Leblanc turbines were installed. The complex included a 25-meter high chimney. The new plant was connected to the Vilanova plant by an underground cable at 50,000 volts, the initial voltage at which the high voltage line had to operate from the El Run waterfall in Huesca, in the municipality of Seira, to the new plant in Sant Adrià. The initial power of the plant was 12 MW, which was subsequently increased to 14.6 MW (1921) with the incorporation of two turbochargers from the Vilanova plant, and finally reached 34.6 MW (1930) with the installation of a new Brown-Boveri turbocharger. The plant was in operation until 1966, when it was scrapped to build the new fuel-gas-fired Besòs thermal power plants on site.

The installation of the power plant in Sant Adrià, with its important investments and the need for a large number of workers during the construction period, attracted many people to Barcelona in the hopes of finding work over the course of these years.

The appearance of these people and their families gave rise, in an area close to the power plant, specifically on the right bank of the Besòs River, a little further upstream from the land on which the new facility was built, to a series of

310. NFHA.CGE. *Consejo de Administración* (16-09-1914).

311. NFHA.CGE. *Junta General de Accionistas* (31-05-1917) (29-05-1918). In April 1917, the plant had a capacity of 6,000 kilowatts, and only in April 1918 did it reach the planned 12,000 kW. Falgueras (1969), pp. 79-82.

constructions and dwellings, usually small houses with courtyards and vegetable gardens, which in many cases were built by the new neighbors, but which over time formed a new neighborhood.

The place came to be known as the neighborhood of La Catalana, which was the popular name of the power plant, and thus a name was born that still exists today. There is also still a road called La Catalana which leads from the bridge on Avinguda Pi i Margall on the right bank of the Besòs to the district of La Catalana.

The Falls of El Run and the Power Plant of Seira (1918)

Work on the construction of the El Run-Seira complex began in the autumn of 1912, as did the laying of a telephone line connecting Seira to Barcelona, a distance of some 262 kilometers. A small 400 HP power plant was also installed to produce three-phase electricity at 6,000 volts for the construction period, taking advantage of the old El Run mill on the Ésera River.³¹²

The definitive project for the El Run falls included a dam some 80 meters long and 5 meters high, with a bypass canal of 8,875 meters, including 8,131 meters of tunnel, and a regulating reservoir of 30,000 cubic meters, a major pressure pipe of 1,040 meters, and a powerhouse for four 10,000 HP units, with all its hydraulic and electrical installations.³¹³

The onset of World War I also affected the construction site, mainly the international supply of machinery and materials, which would result in a significant delay in the arrival of CGE's hydropower to the competitive market of Barcelona. The project continued to face great difficulties in January of 1916, when English authorities did not allow the German pipeline that had been ordered to pass, despite the efforts of Francesc Cambó. The pipeline was ordered again, this time from a Swiss company, but an additional seven months had already been lost.³¹⁴ By the beginning of 1917, everything began to move forward as planned.

During these years, the Seira-Barcelona transmission line had been built. It was inaugurated in 1918 with a voltage of 50,000 volts, and in 1922 it reached the project's planned 130,000 volts, making it the first electricity transmission line in Europe to operate at such a high voltage. The line was 225 kilometers long, with 1,509 iron posts and four substations in Perarrúa, Manresa, Sabadell and Barcelona.

312. Cubero y Bravo (2012), pp. 47-65.

313. NFHA.CGE. *Sección Hidroeléctrica. Informe* (04-02-1954).

314. NFHA.CGE. *Consejo de Administración* (29-01-1916 y 04-08-1916).

Table 41. Eléctrica del Cinca. Board of Directors 1911

Name	Position
Antonio Massó Llord	Chairman
Benito Clavería Barrios	Member of the Board
Francisco Grau Pallés	Member of the Board
Pablo Sánchez Rexach	Member of the Board
Francisco Grau Vilalta	Secretary, Non-Board Member

Source: NFHA.EC. *Consejo de Administración* (14-07-1911).

The commissioning of Seira was described by the chief engineer of the construction, Diego Mayoral: “On Tuesday, August 6 [1918] at 12.16 m, the subscriber of the Seira plant synchronized the system with the general system connected to the Sant Adrián thermal power station, supplying the line with all the load absorbed by the subscribers at that time”.³¹⁵ At that time, the installed power was 14,400 kilowatts.

The Pacts with Eléctrica del Cinca (1918)

The possibilities of expanding Catalana de Gas y Electricidad’s activities in the electricity sector also included taking advantage of facilities that others had built to integrate them into the system, as had been done with the plants of La Propagadora del Gas and La Energía a few years earlier. Such an opportunity appeared with Eléctrica del Cinca (EC) and its Arias falls through a relationship that began in 1916.

The company Eléctrica del Cinca had been incorporated in Barbastro (Huesca) on July 14, 1911, with a capital of 2 million pesetas. The company had initiated the supply of electricity to municipalities in the area between Barbastro and Lleida in 1911, such as Barbastro, Fonz, Estadilla and Estada, and also in Lleida where it reached a supply agreement with the Sociedad Eléctrica de Lleida. It owned the Arias power station (3,000 HP) on the Cinca River, and a thermal reserve power station in Lleida (Table 41).

One of the company’s strong points in the market was its contract for the supply of electricity to Eléctrica de Lleida; at the same time, however, this was also its weak point, because if one day Eléctrica de Lleida stopped buying electricity

315. Mayoral (1919), p. 6.

from it, Eléctrica del Cinca would face a problem difficult to solve. It was easier for a distributor to change suppliers than for a generator to find another market the size of the city of Lleida.

This problem worsened after the signing of the supply contract on December 30, 1914, valid for two years, in which Eléctrica de Lleida did not commit itself to Eléctrica del Cinca being its definitive supplier, come what may. Movements began in March of 1915 with a study of the possible merger of the two companies, a possibility that was eliminated the following June when Eléctrica del Cinca decided to continue supplying the Lleida company, but at the same time to begin to attract customers directly in the city of Lleida, making it the other company's competition and asking the Lleida company to terminate the contract that expired on December 31, 1916, without success.

In 1916, Catalana de Gas y Electricidad approached Eléctrica del Cinca to buy the surplus from the falls of Arias, because it considered that with a transmission line from Arias to Perarrúa of just over 25 kilometers it could add this electricity to the main transmission line from Seira to Barcelona. But the subject became more complicated in 1917 when Riegos y Fuerzas del Ebro (RyFE) began to supply the company Eléctrica de Lleida, taking away from Eléctrica del Cinca its main customer. Catalana de Gas y Electricidad took advantage of the opportunity and offered the company a lease contract for all its facilities, which was signed on March 2, 1918, with a duration of 5 years, for 255,000 pesetas/year, which, as Mayoral indicated: "prevented Eléctrica del Cinca from entering into the control orbit of La Canadiense or Mr. Emilio Riu, both of whom insistently requested it".³¹⁶

The situation did not end here, as the Arias-Perarrúa transmission line was put into operation in April of 1918. And in January of 1919, a few months later, Catalana de Gas y Electricidad was the owner of the shares, and consequently appointed all the members of the Board of Directors.

Something similar was done on the Cinca River itself with the Zaidín waterfall, located in that municipality. On November 28, 1918, a contract was signed with the owner, Manuel de Aranzadi of Pamplona, which included the *lease of the force*, i.e. the use of the electricity generated, with an option for its purchase by Catalana de Gas y Electricidad. A few months later, on August 5, 1919, the facilities were definitively acquired.³¹⁷

316. Mayoral (1919), p. 18.

317. NFHA.CGE. *Consejo de Administración* (30-11-1918).

The Power Plant of Puente Argoné (1920)

Once the Seira power plant was practically finished in 1918, Catalana de Gas y Electricidad decided to continue with its waterfalls plan and the next was the one called Puente Argoné, very close to Seira, located between the drain of the Seira power plant and the so-called Argoné bridge, at the entrance of the narrows of the same name. Work on Puente Argoné began on April 23, 1918 with the construction of the auxiliary power station, although not much progress was made until the completion of the works in Seira in August.

However, Diego Mayoral, CGE's chief engineer of the construction, had not wasted any time. Between the concession of the Puente Argoné waterfall and the Campo waterfall, which was the next in the CGE concessions, there was another concession for a waterfall of equal height, with the shortest channel, owned by some Frenchmen (M. Neveu, M. Matieu and M. Brillouin), with whom negotiations had been held in Paris in November 1917, which had led to the firm transfer of rights to Catalana de Gas y Electricidad on May 28, 1918. With the combination of the two concessions, a difference in level of 100 meters could be achieved. However, there was a problem with the concession bought from the Frenchmen, which was that the waterfall had to be built by July 29, 1920, and it was very difficult both to have it built and to get an extension.

The solution found to reduce expenses and make rapid progress in acquiring additional electricity production, while not exceeding the terms of the French concession, was to merge the two concessions into a single project by extending the deadline for building it, and immediately develop a part, which would be the early stage of the Puente Argoné project, reducing the size of the channel to what would be necessary to conduct only 10 m³/sec, and establishing a temporary power station next to the Argoné bridge, which could be eliminated once the final waterfall was built.

Mayoral explained the provisional nature and savings of the project in the following way: "The pressure pipe of this falls will be made of wood, and this solution has been adopted because of its inexpensive and provisional nature, which will allow it to be easily dismantled and used in another falls. The material purchased in the U.S. is already in our possession".³¹⁸ But the technical equipment was important, a 4,500 HP turbine from Piccard Pictet in Geneva, and the 7,200 kW three-phase Seira generator No. 3 from Oerlikon in Switzerland, which was temporarily installed.

318. Mayoral (1919), p. 11.

Considerable efforts were made in the construction. In May of 1919, 600 laborers were at work; there was no shortage of work and there was a lot of competition for workers. Mayoral commented: “Workers are in short supply, because they are constantly needed for the numerous construction projects in the region: Riegos del Alto Aragón, Saltos de Sabiñánigo, Saltos del Cinca (Hidroeléctrica Ibérica), Estación de Canfranc, Camarasa and above all for the works that are carried out in France, where they obtain wages of up to 12 francs a day”.³¹⁹ Finally, in February of 1920, work was completed and the provisional Puente Argoné power plant was connected to the Catalana de Gas y Electricidad network.³²⁰ The definitive plant was not put into operation until 1948.

The Strike of La Canadiense (1919)

From a social perspective, times also changed. During World War I, business was very good in Catalonia because Catalan industry supplied products of all kinds to the belligerent powers, the companies dedicating themselves to the production of war material. But when the confrontation ended in 1918 and the economies of the countries involved in the war began to function normally again, the factories in Barcelona began to feel the crisis, the lack of work and the lack of profits.

This situation led the workers’ movement, to adapt to the new reality. In Barcelona, perhaps the most significant of action of this kind was made by the Confederación Nacional del Trabajo (CNT), the anarchist union which, at its Sants meeting held in 1918, proposed a change in its traditional internal organization of trade unions to form a new organization based on industry unions, and created, among others, the Sindicato Único de Agua, Gas y Electricidad de la CNT.

In the first months of 1919 a labor problem began like so many others in Riegos y Fuerzas del Ebro, the Spanish affiliate of Barcelona Traction Light and Power. The conflict escalated, reaching a level of complexity and tension that culminated in a general strike, known as the La Canadiense strike³²¹, which lasted for more than

319. Mayoral (1919), p. 12.

320. NFHA.CGE. *Junta General de Accionistas* (31-05-1921).

321. For the full episode you can consult: *La Vaga de La Canadenca*. See www.veuobrera.org [Consulted: 30-08-2012]; Moreno Cullell, Vicente (2011): *La conflictivitat social a Catalunya: sindicalisme, vaga de La Canadenca i pistolisme* (1917-1923). See blog.sapiens.cat [consulted 30-08-2012]; *La vaga de La Canadiense de 1919 i la seva repercussió estatal*. See patrimonihiidroelectric.paeria.cat/ca/calaix-historic/museu-de-laigua-de-lleida/el-dr.-pearson-i-la-canadiense# [consulted 30-07-2012].

40 days and was the longest and most important social conflict in the history of Catalonia.

The problem arose when, at the end of January of 1919, changes were made to the working conditions of the employees of the billing service of Riegos y Fuerzas del Ebro, changes that represented reductions in salaries. The workers asked for advice and support from the CNT's Sindicato Único de Agua, Gas y Electricidad, and the company responded by immediately firing eight of the affected employees. On February 5, the rest of the billing staff began a sit-down strike in solidarity with their comrades, which marked the beginning of the strike. The company dismissed 140 employees from the billing service and replaced them with staff from other services, and decided not to recognize as interlocutor the CNT's Sindicato Único, with which it had already had a serious problem at the Camarasa plant in late 1918.

Matters worsened, and on February 8 the production and distribution workers of Riegos y Fuerzas del Ebro showed solidarity with their comrades and joined the strike, by now practically total at RyFE. On February 10, the company told the strikers that either they went back to work or they would be fired, a move that only made the strike more generalized.

On February 15, at the Barceloneta gasworks of Catalana de Gas, workers were granted the eight-hour working day, something that was not granted generally to all workers in society until a government decree two months later.

At the end of February, the Sindicato Único of the CNT declared a strike in the whole sector, adding Catalana de Gas y Electricidad, Lebon y Cía., Energía Eléctrica de Cataluña, Sociedad General de Aguas de Barcelona and Ferrocarriles de Sarrià to the strike. Workers from newspapers and tramway companies and many other companies also joined in. With the city in the dark, no trams, no newspapers, problems with gas and water, everything was chaotic.

To the Board of La Catalana, Mansana stated: "The events that have taken place since the declaration of the strike by a considerable number of our gasworks, plant, sub-station and office personnel, without any prior notice or claim of any kind, and only in agreement, apparently, with the personnel of similar companies, Lebon y Cía. and Energía Eléctrica de Cataluña, in solidarity with the strike that the employees and workers of the Compañía Riegos y Fuerzas del Ebro have been following for days".³²²

The struggle continued and on March 1 the water, gas and electricity companies told their workers that those who did not show up for work on March 6 would be

322. NFHA.CGE. *Consejo de Administración* (20-03-1919).

fired, a measure that was not very successful. On the contrary, on March 3, the workers of La Catalana in Barceloneta, minus the office workers, went on strike. The situation was serious and Navy Marines were used to replace the workers in their jobs.³²³ On March 9, the Captain General of Catalonia, Joaquín Milans del Bosch y Carrió, ordered the militarization of the employees of the water, gas and electricity companies, aged over 21 and under 31; he ordered them to report to the companies and threatened them with four years' imprisonment if they did not do so. However, on March 10, the gasworks' office staff of La Catalana also went on strike. The Milans del Bosch orders met with little success, but they did result in more than 3,000 workers being sent to prison. The CNT's response was the general strike, which led to a *sine die* paralysis of 70 % of Catalan industry and left a large part of the country without electricity.

Given the seriousness of the situation, the government declared a state of war, while at the same time it sent the under-secretary of the presidency, José Morote, to Barcelona to negotiate and changed the civil governor of Barcelona, appointing Carlos Montañés, the engineer who had convinced Pearson to undertake the Barcelona project and who had drawn up the framework of Barcelona Traction.³²⁴

The state of war implied that the Army operated the trams and the Navy operated the power stations. The presence of Navy technicians was justified because warships were some of the first things to be electrified in Spain, and thus the Navy had experts in the field. Supplying gas was more complex. It was not possible to stop producing gas without allowing air to enter the pipes; the halt produced explosions in some of the city's neighborhoods. The effects of the strike on the population were softened, but it nonetheless continued.

The agreements to end the strike were ratified in an impressive assembly attended by more than 20,000 people, on March 19 in the Las Arenas bullring, and included: the release of the imprisoned workers, the readmission without reprisals of the strikers by the companies, which would pay the salary for half the number of days the strike had lasted, and the establishment of the 8-hour working day. It was agreed that after the final agreement the state of war would be lifted. The demand of the workers' movement for the 8-hour working day was very important

323. NFHA.SCAG. *Bernardo Ten. Notas desde el año 1875 al...* (1875-1932).

324. At that time, Carlos Montañés was a member of parliament for the district of Teruel for the Liberal Party, which was in power; Alvaro de Figueroa y Torres, Count of Romanones, was the president of the government. The instability of the time can be seen in the volatility of the office of civil governor: during 1919 alone, Barcelona had six different civil governors.

and the strike made it possible to achieve this in Spain before France, Switzerland, Holland, Portugal, Belgium, Norway or Sweden.

However, Captain General Milans of Bosch refused to release 34 prisoners under military jurisdiction, and the strike started again on March 24. Finally, the combination of the publication by the government of a decree on April 3 establishing the eight-hour working day and the threats of a lockout by the Barcelona Employers' Federation led to workers returning to their jobs on April 9. The strike ended definitively on April 14.

The effects of the second strike, the one that resumed on March 24th, on La Catalana, were similar to the previous one. Mansana explained to the Board that: "the electricity services, apart from the first days of the strike, had continued to operate thanks to the invaluable assistance of qualified Navy personnel"³²⁵, while the gas services were suspended from March 24 to April 13. The importance of these events and their future repercussion on relations between companies, trade unions and workers was very significant. One indication of the importance of the events can be seen in that, the day after the strike ended, on April 15, the president of the government, the Count of Romanones, was forced to resign and make way for a new president, Antonio Maura.

Hydroelectric Development Concessions

Catalana de Gas y Electricidad was created in 1912 with the five hydraulic concessions on the Esera River (El Run, Puente Argoné, Campo, Santaliestra and Perarrúa), which had been contributed by Francisco Bastos and Eugenio López Tudela to the previous Sociedad General de Fuerzas Hidroeléctricas in 1911, in which the Bertrand family had also become a capitalist partner. It was clear that if the strategy was to be based on hydroelectricity, it had to be present in the hydroelectric development concessions market, which was very active in those years in Catalonia.

The occasion arose when Emilio Riu, who had contributed the concessions in the constitution of the Energía Eléctrica de Cataluña, managed to get Catalana de Gas y Electricidad to acquire four concessions from him and Eusebio Bertrand at the end of 1913. At that time, Bertrand was already the 2nd vice-president of CGE, however, he was polite enough not to attend the Board meeting given his

325. NFHA.CGE. *Consejo de Administración* (14-04-1919).

involvement in the operation. The price established was 2,500,000 pesetas, the operation was carried out in March of 1914, and the civil governor of the province of Lleida acknowledged the subrogation in favor of CGE in all the obligations and rights deriving from the water concessions of the Bonaigua, Espot and Noguera Pallaresa rivers, which had been granted to Emilio Riu. The payment was made on a deferred basis over a period of about four years. The concessions were those of Esterri, Espot superior, Espot inferior and Llavorsí.

The purchase of these concessions also meant adding the Noguera Pallaresa basin and its tributary, the Escita River, to the Ésera basin, where activities had been carried out until then. In 1920, another additional concession was purchased in this area from Emilio Riu, in this case on the Bonaigua River, also a tributary of the Noguera Pallaresa. The corresponding uses were not developed until after the Spanish Civil War by the company Hidroeléctrica de Cataluña, a subsidiary of Catalana de Gas y Electricidad.

Later on, negotiations began with Eléctrica del Cinca, the owner of some concessions on the Cinca River, and after a few years of buying electricity and leasing the waterfall, Catalana de Gas y Electricidad acquired 100% of the company in 1919, obtaining the concessions from Arias and Ariéstolas.

The same process was followed with the falls of Zaidín, also on the Cinca, and by way of this activity Catalana de Gas y Electricidad was now active in three basins. The Ésera is a tributary of the Cinca, and in fact the two operations were relatively close.

Later, between 1915 and 1922, four concessions on the Noguera Ribagorzana River were acquired from the German manufacturer Dietrich Cunze (Montrebel, Fet, Blancafort and Pont de Montanyana). Mayoral referred to them in 1919 when he said that: "As for the waterfalls of the lower Ribagorzana [...] it would be advisable to reach a unification agreement with Mr. Sert, owner of intermediate uses that hinder their rational use."³²⁶ The Sert to which he refers is Domènec Sert, who provided the initial concessions to Barcelona Traction.

Finally, in 1923, when it acquired control of Saltos del Ter, S.A., it obtained an important concession on this river that, with a 160-meter-high drop in height, was capable of producing 16,000 HP. The works were not carried out immediately; it was necessary to wait for Hidroeléctrica de Cataluña to start up the Sau and Susqueda plants in the 1960s (Table 42).

326. Mayoral (1919), p. 30.

Table 42. CGE. Catalana de Gas y Electricidad. Acquisition of hydroelectric concessions (1911-1923)

Year	River	Owner	Notes
1911	Ésera	F. Bastos/E. Pérez Tud.	El Run (Seira) (1909) 21,000 hp
1911	Ésera	F. Bastos/E. Pérez Tud.	Puente Argoné (Seira) 6,118 hp
1911	Ésera	F. Bastos/E. Pérez Tud.	Campo 6,750 hp
1911	Ésera	F. Bastos/E. Pérez Tud.	Santaliestra 19,500 hp
1911	Ésera	F. Bastos/E. Pérez Tud.	Perarrúa 5,295 hp
1914	Noguera Pallaresa	Emilio Riu/E. Bertrand	Esterrí. Boren /Esterrí. Àneu (1908) 10,000 hp and the lakes Airoto, Orri and Garrabea (1908)
1914	Escita	Emilio Riu/E. Bertrand	Espot superior. Sant Maurici (1909) 14,000 hp
1914	Escita	Emilio Riu/E. Bertrand	Espot inferior. Espot (1909) 14,000 hp
1914	Noguera Pallaresa	Emilio Riu/E. Bertrand	Llavorsí. Salt/Llavorsi (Escaló) (1906) 2,700 hp
1920	Bonaigua	Emilio Riu	Molino de Sorpe (1913) and the lakes Gerbert and Cabanes
1919	Cinca	Eléctrica Cinca	Arias 3,040 hp
1919	Cinca	Eléctrica Cinca	Ariéstolas 8,700 hp
1919	Cinca	Manuel Aranzadi	Zaidín
1919c.	Noguera Ribagorzana	Dietrich Cunze	Montrebei (1915c.) 7,200 hp
1919c.	Noguera Ribagorzana	Dietrich Cunze	Fet (1915c.) 7,800 hp
1919c.	Noguera Ribagorzana	Dietrich Cunze	Blanafort (1915c.) 10,200 hp
1919c.	Noguera Ribagorzana	Dietrich Cunze	Pont de Montanyana (1915c.) 17,400 v
1923	Ter	Saltos Ter	Grouping of previous concessions unified by the Saltos del Ter (1907) 16,000 hp

Source: Bastos (1911), p. 13; NFHA.SGFH. *Escritura constitución* (28-10-1911); NFHA.CGE. *Consejo de Administración* (22-12-1913 y 30-11-1918); Mayoral (1919), p. 30; Alayo (2007), pp. 280, 303-304, 308-309, by the author.

The information provided included 18 waterfall concession areas on the Bonaigua, Cinca, Escita, Esera, Noguera Pallaresa, Noguera Ribagorzana and Ter rivers. Some of these concessions had sizeable falls, such as El Run; others were more modest, and others were not developed until 30 or 40 years later. This was important activity to position the company regarding the possibilities of developing new activities in the hot issue of the time, hydropower.

1921-1955

From Electricity to Gas,
Return to Electricity and
then Back to Gas

After a time of great intensity and concentration in the development of new activities in the electricity sector, the large investments that were needed led Catalana de Gas y Electricidad to enter a period of reflection. The company then began a period of involution, back to gas, which culminated in the acquisition of Lebon's gas assets in Barcelona and the lease of electricity activity.³²⁷

A few years later, the harshness of the post-war electrical restrictions and the need to build more falls would lead to electricity again, with the constitution of Hidroeléctrica de Cataluña with banking partners. As the era of natural gas approached, the core business would become focused on this new energy, and the permanent movement between gas and electricity would in this way culminate for many years to come.

The Purchase of Lebon's Assets and the Return to Gas

The aftermath of World War I presented great difficulties for the gas companies, both because of very serious problems with the supply of coal to their gasworks, and because of the severe labor conflict, the most notable representation of which was the strike at La Canadiense during the first months of 1919. The government aggravated the situation by deciding not to allow gas prices to adapt to the increase in the price of coal, thus making the companies' situation very critical. A testimony of the seriousness is the announcement made by Lebon in the press in June of 1919: "The Sociedad Lebon y Cía. informs its subscribers that it will not be able to continue its operation under the current conditions, but will cease to supply gas on the 10th of the current month, making its gasworks available to the government for seizure".³²⁸ Worse, impossible.

The Acquisition of Lebon's Assets in Barcelona (1923)

Primo de Rivera's nationalizing decrees and the electricity competition finally convinced Lebon to abandon its position in Spain. It disposed of some of its assets directly; the Barcelona assets were sold to Catalana de Gas y Electricidad, and finally, the assets it did not manage to sell were grouped together in a Spanish

327. Fàbregas (2012g), pp. 85-92.

328. *La Vanguardia*, June 4, 1919.

company created for this purpose: the Compañía Española de Electricidad y Gas Lebon, which was located within the scope of Sociedad General de Aguas de Barcelona, which had undertaken the same process some time before. The new company was listed on the Barcelona stock exchange. Subsequently, in the 1960s, Catalana de Gas acquired majority control of the company and its name was changed to Compañía Española de Gas. With these transactions the gas-gas competition in Barcelona ended, at a time, however, when gas-electricity and electricity-electricity competition already existed.

The negotiations between Catalana de Gas and Lebon were very complex, as the two companies and the bankers who were to finance the operation had to reach an agreement. The *nationalization*³²⁹ of the Sociedad General de Aguas de Barcelona, carried out in 1920 by a banking consortium led by the S.A. Arnús-Garí, was very present. The banks wanted to repeat the model, build a new company with the assets of La Catalana and Lebon and establish bank control in strategy and management. During these years, Francesc Cambó was very close to the S.A. Arnús-Garí and was also on the Board of Directors of Catalana de Gas.

The managers of the company, thinking of its shareholders, probably preferred to integrate Lebon's assets into Catalana de Gas without further ado, but this placed the banks in the financing of the operation, but not in the strategy. On the other hand, and given the magnitude of the operation, two options were considered, the purchase pure and simple, or, secondly, to lease for a few years with an option to purchase, to overcome the difficult situation at that time.

Lebon's position was that, if the business was to be leased, the manager had to be José Mansana, a person of great honesty who was well-known to the company, and not the banks, in which it did not trust and which could weaken the company so that at the time of the actual purchase it would no longer have any value. Lebon's position, as Eusebio Bertrand explained, was that of "refusing to sign this contract if it was not based on direct exploitation by La Catalana, claiming that only the competence and honesty that they had been able to appreciate in Mr. Mansana, during the more than thirty years of relations they had maintained with him, could be a sufficient guarantee for them that the situation that such a contract created for La Catalana would not be abused, through which it could annul the competition of the Compañía Lebon without definitively carrying out

329. In the jargon of the time, nationalization referred to the acquisition by Spanish investors of a foreign company operating in Spain.

the contract". And it continued: "... this option contract must be the basis of the agreement put to the bankers, which cannot be other, in interest, than that which recognizes, respects and guarantees not only the material interests of the Sociedad Catalana de Gas y Electricidad, but also its moral interests, since both together form the real patrimony of the company".³³⁰ An important defense of intangible values in 1920.

The tensions were evident and led to a General Shareholders Meeting held to discuss the issue and take the relevant resolutions, in which it was proposed and approved that the Board of Directors "may contribute to a company to be incorporated for this purpose, the gas belongings of La Catalana and the rights deriving from the option granted by Lebon y Cía. In accordance with the agreements and conditions that the Board deems most convenient to the corporate interests".³³¹

In all probability the person who was in the balance was José Mansana, a manager who had the confidence of the French, due to his previous relations with Cambó, and of the Banca Arnús, probably also with the confidence of the bankers. Over time, the option chosen was to integrate Lebon's assets into Catalana de Gas, but the company would continue with its usual managers and shareholders, and would maintain the professional and business seriousness that Eusebio Bertrand defended.

Lebon and Catalana de Gas reached an initial agreement in 1921 for a five-year option right, but the following year La Catalana launched a bond issue of 10 million pesetas, at 6% interest, maturity at 45 years and mortgage guarantee on the gas assets of both La Catalana and Lebon, and announced that: "After the disappearance of the exceptional circumstances of the European war and the normalization of the operation of its business, Catalana de Gas y Electricidad, taking advantage of the depression of the franc exchange rate, has concluded an agreement with the Sociedad del Gas Lebon, under advantageous conditions, by virtue of which it will enter into possession of the latter's property and belongings".³³²

The assets acquired by Catalana de Gas definitively on May 3, 1923, corresponded to the gasworks (El Arenal and Sant Martí, Gràcia was already closed), real estate (such as the principal assets, the building on Calle Balmes, and land on Calle Córcega/Bruc), distribution networks, branches, interior installations, meters, as well as concessions, contracts and customers.

330. NFHA.CGE. *Consejo de Administración* (21-12-1920).

331. NFHA.CGE. *Junta General de Accionistas* (31-12-1921).

332. *La Vanguardia*, April 6, 1922.

On the issue of coal, Catalana de Gas y Electricidad had a better position than Lebon on the market after its acquisition of control of the Compañía Anónima de Carbones Asturianos, with mines in Asturias, which was the sixth largest producer in Spain, with around 100,000 tons/year.

With this operation, the competition for the Barcelona market that began in the mid-19th century ended, first with great fury and later with more understanding, but, in any case, a difficult, long and significant confrontation.

The New Uses of Gas (1927)

La Catalana's emphasis on gas, with the purchase of Lebon's assets and the practical loss of lighting to electricity, forced it to seek new markets and activities in order to continue growing and developing its activity and thus ensure the future of the company.

The action was aimed at strongly promoting the kitchen. Classes were organized with accredited cooks to demonstrate the qualities and advantages of cooking with gas compared to the use of coal, which was the usual fuel for these tasks in 1926.

Also published in 1927 were impressive advertising brochures by famous cartoonists such as Junceda, which demonstrated the modernity, cleanliness and efficiency of cooking with gas. Joan G. Junceda was a draftsman and illustrator who collaborated in almost all the Catalan publications of the time, such as *Cu-Cut*, *Papitu*, *Picarol*, *D'Ací i d'Allà*, and especially *En Patufet*, where he illustrated the stories written by Josep M^a Folch i Torres. In fact, and very much ahead of its time, an animated film was produced featuring a cook, a chicken and a gas cooker.

Finally, along the same lines, it was decided to set up a showroom shop in a space next to the headquarters, on Avenida del Portal de l'Àngel, 20, where the most modern gas appliances could be exhibited, and which would also be the appropriate setting for cooking classes. In short, the aim was to impress the potential client on the usefulness and practicality of the new uses and the new appliances, with modern advertising and promotion techniques, showroom included. The facade was marked: APLICACIONES DEL GAS. EXPOSICIÓN Y VENTA ("GAS APPLICATIONS. EXHIBITION AND SALE").

The design and interior design was entrusted to Santiago Marco, the main representative of art deco in Spain, a person of great prestige, trained at La Llotja, who was president of the Fomento de las Artes Decorativas (FAD) for 27 years. Among his works, the most outstanding are the cinema Publi at Paseo de Gràcia in Barcelona, and the Pabellón de los Artistas Reunidos, at the Exhibition of Decorative Arts, held in Paris in 1925.

In 1929-1930, the gas showroom/shop of La Catalana received the prize for the best commercial premises from the City Council of Barcelona. The awards had been instituted in 1899 to reward the best building built in the year and from 1902 also the best commercial premises.

In short, marketing, commercial promotion, advertising, demonstration spaces, a whole range of modern techniques at the service of the discovery of new gas functionalities by citizens. It was a sign of commitment to the continuity and growth of the company on solid foundations of modernity, one hundred years ago, at the beginning of the 20th century.

The MAN Gasometer of Sant Martí (1932)

With the increase in gas production and consumption, in the early 1930s, La Catalana considered the possibility of increasing the gasometric capacity it had, in order to have a minimum reserve capacity and better adapt to the daily modulation curve of demand in Barcelona. At that time, the company's gasometers in the city could store a total of 146,000 cubic meters of gas, distributed among the Barceloneta (88,000), El Arenal (40,000) and Sant Martí (18,000) gasworks. The gasworks most in need of expanding its gasometric capacity was, of course, that of Sant Martí.

The technology used in the gasometers until now was wet gasometers. The gas was stored in this type of installation between the dome of the gasometer and a bed of water in the tank that made a hydraulic seal adjusting the capacity by the elevation of the dome. But, in 1924, the German company Maschinenfabrik Augsburg-Nürnberg A.G. (MAN) had patented a new dry gasometer technology, consisting of a vertical cylinder or prism in which a piston was raised or lowered depending on the gas stored.

La Catalana finally chose the most modern technology option and decided to install a MAN gasometer at the Sant Martí gasworks with a capacity of 100,000 cubic meters, thus increasing the capacity of the city's gasometers by 70% in a single operation.

Contacts with MAN began in 1932. The City Council approved the project in 1935, and the manufacture and construction then began commissioned to MAN and La Maquinista Terrestre y Marítima. The gasometer was practically finished at the beginning of 1936, but bureaucratic problems and the Civil War prevented its implementation, which finally took place on January 16, 1940 in the harsh context of the post-war period.

The impressive height of the gasometer, about 70 meters high, in an area without large buildings, defined the skyline of Poble Nou for many years. The possibility of ascending to the dome with an exterior elevator made it the perfect viewpoint of the progress of the works on the Barcelona coast for the 1992 Olympic Games. The gasometer was in operation until the gasworks were shut down due to a change from gas to natural gas, and was definitively demolished in 1992.

Horacio Echevarrieta: Saltos del Ter and Carbones Asturianos

Horacio Echevarrieta on the Board (1923)

In 1923, in addition to the acquisition of Lebon's assets in Barcelona, other important events also took place affecting the company's evolution in the following years. One of them was the entry onto the Board of Directors of Catalana de Gas y Electricidad of the important Basque industrialist and financier, Horacio Echevarrieta Maruri, as a result of the agreement signed between the two parties on March 7, 1923. Echevarrieta provided the company with control of Saltos del Ter and the Compañía Anónima de Carbones Asturianos, as well as the 750-ton ship, *Agadir*. It also incorporated the right to supply 50% of the energy used by the Ferrocarril Metropolitano de Barcelona. The compensation was 24,000 shares of Catalana de Gas, which at the time represented 16% of the share capital.³³³

With this movement Echevarrieta became an important shareholder of La Catalana, managing to place his stake in Saltos del Ter, which had hydraulic concessions on this river (the Ter) but had not managed to build the necessary hydroelectric developments, and also sold Carbones Asturianos to one of his large coal customers. La Catalana obtained new concessions in another river basin, and ensured the supply of coal after the hardships of the last years of World War I. On the other hand, while Echevarrieta managed to enter one of the major electricity companies in Catalonia, La Catalana established contact with

333. Díaz Morlán (1999), p. 170; Muriel (2002), p. 69. The Board of Catalana Gas y Electricidad reports "on the negotiations with Mr. Horacio Echevarrieta, which have resulted in a note signed on the seventh day of this month,[...] according to which La Catalana will be able to acquire control of the Compañía de Carbones Asturianos, and the right to supply 50% of the energy to be purchased by Ferrocarril Metropolitano de Barcelona, S.A., whose right corresponds to Mr. Echevarrieta, according to a deed authorized by the Notary of this City, Mr. Antonio Gallardo". NFHA.CGE. *Consejo de Administración* (16-03-1923).

an industrialist present in many important contexts in the country, including the electricity industry. Echevarrieta continued as president of Saltos del Ter and Carbones Asturianos.

Pablo Díaz Morlán points out that: “His relations [Echevarrieta] with José Mansana, the Managing Director, were very close, to such an extent that Echevarrieta’s influence on the management of the company was exercised through him”. José Mansana’s omnipresence in these years was evident; he was, in the end, the one who generated confidence in the various surroundings. However, in December 1923, a few months later, Echevarrieta sold 8,000 of the 24,000 shares received, continuing to hold a 10.7% stake in the company’s capital.³³⁴ Echevarrieta was a member of the Board of Directors of Catalana de Gas y Electricidad until November 28, 1934, when he resigned; it could be that this resignation had to do with the death of José Mansana a few months earlier, on April 4, 1934.

Horacio Echevarrieta Maruri was born in Bilbao on September 15, 1870, the son of Cosme Echevarrieta, partner and manager of the property holding Echevarrieta y Larrinaga. To evaluate his political, business and financial dimension, it should be borne in mind that he was for years the director of Bilbao’s republicanism, as well as a member of Congress (1910-1918) and president of the Cámara de Comercio de Bilbao (Bilbao Chamber of Commerce) (1915). He was the architect of the economic concert of the Basque provinces in 1925.³³⁵ Additionally, he was a member of the Board of Directors of the Banco de Bilbao, the Banco de Comercio and the Compañía Minera de Sierra Menera, which had interests in iron mining in Vizcaya and coal mining in Teruel and Guadalajara, as well as in the land development business in the Ensanche of Bilbao.

In the electricity sector, apart from Saltos del Ter, whose activity will be described later, he also participated in Catalonia in the constitution of the Sociedad Productora de Fuerzas Motrices in 1917 with the brothers Emilio and Daniel Riu, with a capital of 6.4 million pesetas.³³⁶

His most important involvement in the field of hydroelectric developments was, however, in the waterfalls on the Duero River, when he participated in the constitution on July 3, 1918 in Bilbao of the Sociedad Hispano-Portuguesa de Transportes Eléctricos, with a capital of 150 million pesetas, in which the Sociedad General de

334. Díaz Morlán (1999), p. 171.

335. Muriel (2002), p. 71.

336. Díaz Morlán (1999), p. 168.

Transportes Eléctricos and the Banco de Bilbao were listed as shareholders. Echevarrieta was the president of the company from 1919 to 1933, when international concessions were obtained on the Duero River (1926); American shareholders subsequently acquired 25% of the shares, and the Banco Urquijo and Caja de Ahorros Municipal de Vizcaya also entered as shareholders, and the company's name was changed to Saltos del Duero (1928).³³⁷ The company would later become Iberduero and finally Iberdrola.

Saltos del Ter (1923)

The company Saltos del Ter, S.A. was founded in 1905 by a group of Basque industrialists in Bilbao with a capital of 8 million pesetas, with the aim of building a hydroelectric development between the municipality of Sau and La Cellera, as they thought it could have a 160-meter high drop that could produce up to 16,000 hp.³³⁸

Horacio Echevarrieta bought the controlling stock of the company in 1907, and commissioned the project to Enrique Grasset y Compañía; but in view of the serious difficulties it presented and the heavy investment required, the contract was rescinded and the works were stopped. The project thus entered into a few years of waiting, until in 1917 Echevarrieta commissioned the engineer José Orbegozo to analyze the situation. In view of the size of the fall, Orbegozo recommended that work should not begin until it was possible to ensure that the financial capacity of the company was sufficient to complete the construction and make it operational. This involved finding new investors interested in becoming involved with the project.³³⁹

To reach the next step, six more years had to pass until 1923, when in a combined operation Echevarrieta transferred control of Saltos del Ter to Catalana de Gas y Electricidad, thinking that this would provide the necessary financial capacity for the development of the investment.

However, the magnitude of the work and the associated costs, as well as the Sau reservoir project promoted by the Mancomunitat Hidrogràfica del Pirineu Oriental (Hydrographic Association of the Eastern Pyrenees) (1931), delayed the work. When Catalana de Gas created Hidroeléctrica de Catalunya in 1946, the company Saltos del Ter was contributed at the time of its constitution. Over the years, the project was divided in two, and gave rise to the Sau (1963) and Susqueda (1967)

337. Díaz Morlán (1998), p. 196.

338. Alayo (2007), p. 790.

339. Díaz Morlán (1999), p. 104; Muriel (2002) p. 69.

power plants, integrating the Pasteral waterfall into the integral use of the Ter River in that area.³⁴⁰

Carbones Asturianos (1923)

Like all gas companies, Catalana de Gas y Electricidad had suffered serious setbacks during World War I due to the lack of coal and also because of its very high prices; it even had to declare losses and was unable to distribute dividends. Therefore, the fact that Horacio Echevarrieta, the owner of Compañía Anónima de Carbones Asturianos, one of its main coal suppliers, appeared and proposed to sell it control of the company must have seemed the definitive solution, come what may, for being able to guarantee a stable and controlled supply of coal of known quality and at reasonable prices. At that time, Carbones Asturianos owned coalmines in Asturias and was the sixth largest coal producer in Spain, with an annual production of around 100,000 tons/year.

Subsequently, time would show that the safeguarding of coal supplies that was attempted with the acquisition of Carbones Asturianos worked in normal times, but that in times of major crises, such as the Spanish Civil War, or its post-war period with World War II, did not provide the expected protection. An example of these circumstances occurred during the 1940s, when the coal from the mines of Carbones Asturianos arrived in Barcelona for Catalana de Gas, its parent company, this coal was seized by the authorities and handed over to Renfe for its railways, a utility that had been defined as having higher priority than the gas service.

The company Carbones Asturianos was set up by Basque businessmen in Bilbao in 1890 with a capital of 1 million pesetas, 50% of which was paid up. The company acquired mining properties basically in the town of Ciaño, in the Samuño valley of Asturias. The concessions were spread over about 4 square kilometers, in an area that had not been exploited until then due to a lack of access³⁴¹ (Table 43).

The production of national coal was boosted from 1906 onwards by the new tariff law that increased the protection of national coal, and additionally by the Law for the Protection of National Industry of 1907, which was the first legal provision that obliged Spanish industries to consume national coal. It was at this time that Horacio Echevarrieta bought C.A. Carbones Asturianos. During its early years

340. Alayo (2007), pp. 280, 390-395 and 790. The initial concession of the Pasteral came from the request of Federico Homs in 1870, representing the company Salvadó, Homs y Burés for the production of the electricity needed for its textile factory located in the neighboring municipality of Anglès.

341. Coll i Sudrià (1987), p. 203; Díaz Morlán (1996), p. 163; Díaz Morlán (1999), p. 107.

Table 43. C.A. Carbones Asturianos. Production (1890-1930)

Year	Production (t)	Ranking among coal companies in Spain
1890	19,000	15
1900	56,000	14
1910	97,000	11
1920	114,000	8
1930	99,000	15

Source: Coll and Sudrià (1987), pp. 220-222.

the company maintained its production at between 90,000 and 100,000 tons, with little dividend distribution.

The economic situation clearly improved during the years of World War I, which, while harming coal consumers such as Catalana de Gas and Lebon, obviously benefited Spanish producers very much. The price per ton of pithead coal went from 18.54 pesetas in 1914 to 25.03 in 1916 and finally to 40.65 in 1918, the last year of the war; in short, it more than doubled its price. It is clear that at that time there were no restrictions on demand, and however many tons that could be placed on the market could be sold at a good price; however, a restrictive element was the possibility of transport, that is to say, of being able to extract such large quantities of coal from the mining basins with the infrastructure of the Asturian railways. It is worth recalling here the appointment by Cambó, in 1918, of Francisco Bastos, a man from Catalana de Gas, as special delegate in Asturias with responsibility for the organization of the transport and distribution of coal in Asturias.

The company clearly improved its dividend policy at that time thanks to the profits achieved, while at the same time recapitalizing the company with a capital increase fully released on December 14, 1916, going from 1 to 4 million pesetas, and repeating the mechanism in 1919 to reach 6 million pesetas (Table 44).

After these years of growing prices and demand with significant profits, Horacio Echevarrieta contributed Carbones Asturianos to Catalana de Gas. He traded coal for electricity in 1923. Catalana de Gas was a historical client of the company, with important volumes of purchase, for example, in 1924, 58% of the coal produced by Carbones Asturianos was acquired by Catalana de Gas. The gas sector

Table 44. Coal consumption in the gas industry in Spain (1860-1935)³⁴²

Year	Consumption (t)	Percent of Spanish consumption
c. 1860	40,000	5.0%
c. 1870	50,000	4.4%
c. 1890	240,000	7.2%
c. 1925	300,000	4.1%
Average 1932-1935	435,800	5.9%

Source: Coll and Sudrià (1987), pp. 220-222.

was an important customer of the Spanish coalmines, consuming between 5 and 7% of the national production on a continuous basis according to the calculations of Sebastià Coll and Carles Sudrià.

The Cooperativa de Fluido Eléctrico and the Lease of the Electrical Activity

The growth opportunities in the gas sector — after the acquisition of Lebon's assets — and the acceleration of the electricity sector during these years, with very important investment requirements and new capital for the construction and development of waterfalls and hydroelectric power plants, made Catalana de Gas reflect on its possibilities of having a significant presence in both markets. In the end, it decided to continue with gas and to lease its electrical business, specifically to the Cooperativa de Fluido Eléctrico in 1928.

The Cooperativa de Fluido Eléctrico had been constituted in 1920 by a group of industrialists eager to have their own alternative electricity supply for their factories. Among its promoters was the Bertrand family, which, as we have seen, was among the promoters of the Sociedad General de Fuerzas Hidroeléctricas, and then in a position clearly related to Catalana de Gas y Electricidad.

In 1921, La Cooperativa took over the Hidroenergía del Cadí plant and thus also gained control of the Sociedad Española de Construcciones Eléctricas, S.A., the

³⁴². Data based on probable sectorial distribution of coal consumption in Spain.

representative of the Swiss Brown Boveri in Spain, a control it maintained until 1924, when relations with Catalana de Gas began. Later, in 1926, La Cooperativa became a public limited company, kept the name of Cooperativa de Fluido Eléctrico and added the corresponding S.A. The change was motivated by regulations that did not allow a co-operative to act commercially as a company for all purposes.

The Cooperativa de Fluido Eléctrico, S.A. (CFE), was established with a capital of 50 million pesetas, and almost immediately made an agreement with a new technological partner, the Swiss company Motor Columbus, which managed to open the Adrall thermal power plant (Lleida) the following year.

Finally, in 1928, Catalana de Gas y Electricidad, which was already participating in the Cooperativa de Fluido Eléctrico, leased to it all its electrical installations of both the company itself and its subsidiaries: Saltos del Ter, La Energía and Eléctrica del Cinca, and therefore ceased to directly manage the electricity assets it owned.

The CFE then connected the Adrall thermal power plant with the Sant Adrià thermal power plant by means of a 100,000 volt overhead line and started up the Campo hydroelectric power plant on the Esera River, reaching an important agreement in 1931 with Forces Hidroelèctriques d'Andorra, S.A. The agreement with Motor Columbus ended in 1932, and from then on, the company's strategy was developed once again by Catalana de Gas.

As it will be remembered, in 1920 the Puente Argoné power plant was inaugurated in February, and the project for the Ariéstolas power plant on the Cinca was completely halted in June. In this context, in February 1921 work began on the Campo power plant, downstream of Puente Argoné on the Esera River, with the project to build a 3.5-metre high dam, which would be the initial project.

The situation was then complicated by complaints from the Canal de Aragón y Cataluña regarding the alterations introduced in the Ésera as a consequence of the existence and exploitation of the El Run and Puente Argoné waterfalls, a series of disputes that would last five years, during which the Campo project was stopped.

However, this halt allowed for reflection and the appearance of a new project: that of increasing the height of the dam to 11 meters and thus improving the possibilities of the falls' electrical production. Then, the project, as Joan Carles Alayo indicates, followed two paths, the initial one based on the 3.5-metre dam that continued to be built, albeit temporarily, and which would be inaugurated in 1929³⁴³, and a new project based on an 11-metre dam.

343. Alayo (2007), p. 818.

The new project had to be approved and therefore had to go through the whole administrative process again. It began with the request for authorization for the expansion of the dam implemented on November 3, 1926. The corresponding permit was not obtained until five years later, on August 27, 1931, by resolution of the Civil Government of the province of Huesca.

A little later, on April 30, 1932, Catalana de Gas obtained authorization to exploit the waterfall next to the dam, and a period of five years was established for the completion of the works, which was aimed at 1937. The beginning of the Civil War stopped everything, and in the post-war period a new deadline of April 30, 1940 was set.³⁴⁴ Finally, after so much provisional activity, the projects of Puente Argoné and Campo were merged into a new project called Congosto Argoné, which began in 1948.³⁴⁵

The Years of Electricity: An Assessment

For Catalana de Gas y Electricidad, the start up of the Seira power plant was a great step forward, it meant the culmination of a history begun in 1911 with the Sociedad General de Fuerzas Hidroeléctricas, and which had involved great technological, personal and obviously financial efforts. It also led to electricity becoming more and more important in the company's activities, and in 1919 the Board recognized that: "...the current production of electricity is equal to the largest gas production that the Company has ever had".³⁴⁶ In the gas market, the company had been in business for 76 years at the time, in the electricity market for 23 years, and in the hydropower market for only 5 months, the scale of movements grew larger and faster over time, a symptom of modernity (Table 45).

The importance of what has been achieved in electricity can be summed up by the positions achieved: in 1917, La Catalana was the third largest electricity company in Spain in terms of installed electricity capacity, only behind Energía Eléctrica de Cataluña and Hidroeléctrica Española. In 1927, after the appearance of Barcelona Traction (BT) and other companies, it remained the sixth largest electricity company in the country.

344. NFHA.CGE. *Sección hidroeléctrica. Informe* (04-02-1954).

345. Alayo (2007), p. 317.

346. NFHA.CGE. *Consejo de Administración* (24-01-1919).

Table 45. Main electricity companies in Spain according to installed power (1917-1927)

Sociedades	Power installed (hp) 1917	Power installed (hp) 1919	Power installed (hp) 1927
Barcelona Traction L&P	35,000	130,000	135,000
Hidroeléctrica Española	44,000	64,000	125,500
Energía Eléctrica de Cataluña	50,000	60,000	61,000
Productora de Fuerzas Motrices	—	20,000	42,500
Hidroeléctrica Ibérica	16,000	16,000	42,000
Catalana de Gas y Electricidad	42,000	41,000	39,000
Unión Eléctrica Madrileña	14,000	14,000	20,000

Source: Instituto Nacional de Estadística (1916-1927): *Anuario Estadístico de España*. Madrid: INE.

The progressive increase in the importance of electricity and the loss of importance of gas in these years transformed Catalana de Gas y Electricidad basically into an electricity company, if not because of its history, then because of its investments and assets. In 1900, 75% of the fixed assets were invested in the gas industry, while by 1920, around 75% of the company's fixed assets were already invested in electricity. The change in just 20 years was of an intensity difficult to surpass (Graph 5).

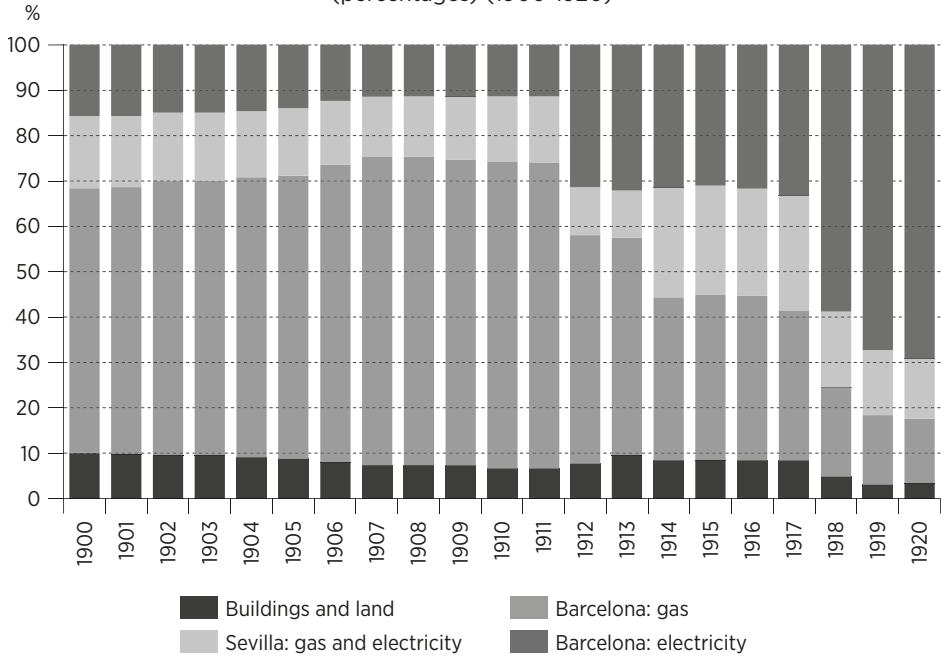
In 1920, the importance of hydraulic generation was recognized when it was explained in the Board of La Catalana that the production of the Seira power plant and the Arias power plant made the production of thermal electricity unnecessary.³⁴⁷

However, it arrived late; both Barcelona Traction and Energía Eléctrica de Cataluña (EEC) had moved faster. The Seira plant was commissioned four years later than Seròs or Cabdella, and the Sant Adrià de Catalana de Gas y Electricidad (CGE) thermal plant was also inaugurated four years later than the Sant Adrià thermal plant of EEC, although in this case CGE had previously operated the Vilanova thermal plant in Barcelona.

If the initial companies were all created in the last months of 1911, what caused the delay of Catalana de Gas? Perhaps the analysis should focus on what happened between the constitution of the Sociedad General de Fuerzas

347. NFHA.CGE. *Consejo de Administración* (31-05-1920).

Graph 5. Catalana de Gas y Electricidad. Structure gross tangible fixed assets (percentages) (1900-1920)



Source: NFHA.SCAG. *Juntas Generales* (1900-1912); NFHA.CGE. *Juntas Generales* (1912-1921) and by the author.

Hydroeléctricas (SGFH) in 1911, and the creation of Catalana de Gas y Electricidad, at the end of 1912, a year later. This year was basically lost because until August of 1912 it was thought that the operation to be carried out would be the merger of EEC with the SGFH and the Sociedad Catalana para el Alumbrado por Gas and that this would make up the new Catalana de Gas y Electricidad, which would be large enough to face Barcelona Traction. During the same months, it so happened that Lebon wanted to leave the Central Catalana de Electricidad, resulting in the corresponding additional disorder (Table 46).

A year's delay does not justify a four-year pause, however, it should be noted that BT and EEC practically managed to start up their basic installations (Seròs and Cabdella) before the start of the crippling mechanism of World War I, with the problems of availability of materials and equipment that have been mentioned, and which caused a very significant delay in the execution of the projects.

Catalana de Gas y Electricidad was very active in the electricity sector from 1911 to 1920; it reduced its activity from the acquisition of Lebon's gas assets in Barcelona, and subsequently abandoned its direct activity in the

Table 46. Power plants built in Catalonia (1913-1920)³⁴⁸

Year	BT	EEC	CGE
1913	Sossís (H)	S. Adrià (T)	—
1914	Seròs (H)	Cabdella (H)	—
1915	—	—	—
1916	Tremp (H)	—	—
1917	—	—	S. Adrià (T)
1918	—	Vic (H)	Seira (H)
1919	—	Molinos (H)	—
1920	Camarasa (H)	—	Puente Argoné (H)

Source: Alayo (2007), pp. 797, 809 and 818 and by the author.

electricity sector by leasing its assets and equipment to the *Cooperativa de Fluído Eléctrico*.

But electrical activity was not completely abandoned. After the end of the Civil War, *Catalana de Gas* returned to the sector by creating *Hidroeléctrica de Cataluña*, which built waterfalls and later became active in thermal power stations and in the first nuclear power plant in Catalonia. Later, *Catalana de Gas* abandoned electricity again (1987) and, in the 21st century, built the first natural gas combined cycle plant in Spain, by then known as *Gas Natural SDG*. Finally, the takeover of a major electricity company — *Unión Fenosa* — in 2009 gave rise to *Gas Natural Fenosa*, a clearly multi-utility, future-oriented company.

In short, history explains the evolution from those initial electricity companies that existed in Barcelona in 1911 when the struggle for hydroelectricity in Catalonia began. Among them, and most importantly, there was a German company, a Franco-Swiss company, a theoretically Canadian company and a Spanish company; the evolution in the following years meant that the Canadian company ended up absorbing the German and the Franco-Swiss companies in one way or another, and disappeared in turn in the 1940s after a famous declaration of bankruptcy for non-payment of debt service. The local company that existed for almost 80 years before that situation, then the *Sociedad Catalana para el Alumbrado por*

348. Abbreviations: (BT): Barcelona Traction Light & Power; (EEC): *Energía Eléctrica de Cataluña*; (CGE): *Catalana de Gas y Electricidad*; (H): Hydraulic; (T): Thermal.

Gas, continues to develop its history and is the same company that now, in 2018, operates under the name of Naturgy.

A New Managing Director: Ricardo Margarit

The proclamation of the Second Republic in 1931 opened a period of change, but also of political upheaval, which would lead to the uprising of General Franco against the established order, the dramatic period of the Civil War and the difficult post-war period. In this context of problems and difficulties, Catalana de Gas also had to face the loss of its managing director, José Mansana, who was replaced by Ricardo Margarit.

José Mansana Terrés passed away in 1934, bringing to a close a long period as chief executive that began in 1892, a dense career spanning a long 42-year period in which peace had been achieved with Lebon, whose assets were later acquired. The struggle and competition with electricity and its multinationals had also been faced, using their own weapons by building hydroelectric dams and power plants, first with AEG, and then with Barcelona Traction. The Board of Directors and Catalana de Gas y Electricidad were his creation. He left a great legacy, but difficult times were approaching. He was replaced on the Board of Directors by the politician Jaume Carner Romeu³⁴⁹, and in the management of the company by Ricardo Margarit.³⁵⁰

Ricardo Margarit Calvet (Rubí, 1886 - Barcelona, 1974) was appointed as Mansana's successor as managing director, and was subsequently appointed a board member in 1946. Margarit was an industrial engineer and had joined the Sociedad Catalana in 1912 as chief engineer of the Foreign Service and Commercial Services. In 1919 he was appointed secretary to the managing director Mansana, and later deputy director (1923), a position he held until his appointment as managing director. He was one of the architects of the agreement for the lease of electrical assets with the Cooperativa de Fluido Eléctrico at the end of the 1920s.

349. Jaume Carner Romeu was a politician who was a member of different parties from the Lliga Regionalista to Esquerra Republicana de Catalunya. During the Second Spanish Republic he was appointed Minister of Finance of the second government of Manuel Azaña in December 1931, a position he resigned from due to illness in June 1933. He replaced José Mansana in April 1934, but died a few months later, in September of the same year.

350. José Mansana's family continued in the company through his son-in-law, the industrialist Pedro Giró Minguella, appointed director in 1929, and later vice-president for many years (1939-1984). Fàbregas (2014d), p. 8.

Ricardo Margarit had to manage the convulsive situation of the Civil War, with the assets of Barcelona and Seville in different zones, and the difficulties of the post-war period. He was also the promoter of the creation, in the 1940s, of Hidroeléctrica de Cataluña for the construction of falls and hydroelectric power stations. The organization in Margarit's time was very simple, he was practically responsible for all aspects of management, with the support of a technical assistant director, Luis Marquet Torrents, and an administrative assistant director, Ramiro Delgado Álvarez, with a strongly hierarchical structure. He was finally replaced as chief executive by Pere Duran Farell in 1961, and appointed vice-president of Catalana de Gas y Electricidad, a position he held until his death in 1974.

Margarit did not have the strong involvement with civil society that Mansana had cultivated; he was a complex, difficult character, very focused on his activity, with a real obsession for maintaining the independence of La Catalana during the times it was threatened by confrontations with the electricity multinationals, and later reluctant to involve the banks in the companies. In his youth, when he was only fifteen years old, he had participated in the 1900 Paris Olympic Games with the four-man rowing team with coxswain of the Real Club Marítimo de Barcelona.

The Spanish Civil War

On July 18, 1936, three complicated years of difficulties and problems began with General Franco's uprising against the legality of the Second Republic, which led to the takeover of the Barcelona facilities of Catalana de Gas by the workers' unions, later by the Generalitat and finally by the state, and the legitimate owners were removed. These were years of difficulties and unconventional approaches.

Workers' Control (July 1936) and Seizure (August 1936)

On June 30, 1936, almost fifteen days before General Franco's uprising, the members of the Board of Directors met in what would be, although they did not know it, the last session for a long time; the managing director, Ricardo Margarit, also attended the meeting (Table 47).

The Board started normally with a review of the situation of the treasury, manufacturing and customers. But the tensions of the time were noticeable in the presentation of a report on "a project of work bases that the Unions will present to the Gas and Electricity Companies", with proposals such as the following:

Table 47. Catalana de Gas y Electricidad. Board of Directors (1936)

Name	Position
Eusebio Bertrand Serra	Chairman
Adolfo Oller Bosch	Vice-President
Álvaro Camín de Angulo	Member of the Board
Enrique Ferrer Portals	Member of the Board
Federico Travé Escardó	Member of the Board
Eugenio López Tudela	Member of the Board
José M. ^a Ameller Badía	Member of the Board
Vicente Coma Ferrer	Member of the Board
Juan Bertrand Mata	Member of the Board
Pedro Giró Minguella	Member of the Board and Secretary

Source: NFHA.CGE. *Consejo de Administración* (30-06-1936).

- Recognition of Gasworks/Plant Committees, Technical Commissions and Trade Union Delegations in the workplace.
- Mandatory unionization for staff except for the category of officials.
- For the entry of new personnel, the Labor Exchange of the Unions had to be consulted.
- Thirty-six hours a week for all jobs, both manual and commercial [sic].
- Major salary increases.
- A scale of retirements of up to 90% of earnings at twenty-five years of service.

Once the conflict began, the situation of Catalana de Gas y Electricidad was like that of so many companies with installations on both sides of the conflict. Initially, in the case of La Catalana, the gasworks and installations in Catalonia were managed by the Serveis Unificats de Gas de Catalunya (basically controlled by the CNT, of anarchist ideology), and those in Seville, by the Board of Directors and the management.

Operations seem to have been alright during this stage, despite the shortage of raw materials, although with the feeling that some gasworks were being managed to provide a basic service to the city.

However, the strategic position of the Barceloneta gasworks, with its facilities and gasometers, next to the city's port and the workshops of La Maquinista

Terrestre y Marítima, which manufactured military equipment, made the facilities a clear target for the Franco regime's aviation bombings in the period 1937-1939.

The aerial bombardments were basically carried out by the Italian Aviazione Legionaria with Savoia planes of different models and with results of all kinds. Catalana de Gas was first hit on July 25, 1937. As a novelty, beginning in October of that same year, pilots not only dropped bombs, but also strafed the citizens of the neighborhood with machine gun fire. Tradition has it that a bomb hit a gasometer, but that the water bed in the waterlock cushioned the blow and prevented it from exploding; it remained, however, inside the gasometer. The bombing of January 19, 1938 left 170 dead and 200 wounded. The last bombing occurred on January 24, 1939; two days later, General Franco's troops entered the city.

In general, after the failure of the military uprising in Barcelona on July 19, 1936, when the workers returned to their companies, they found themselves in some cases facing the strange situation that the owners or managers had disappeared, so the employees took control, spurred by a significant process of citizen enthusiasm.

Almost immediately, in other companies where their leaders were still in office, the same process of workers' intervention took place, very much in the anarcho-sindicalist line prevailing at that time. In conclusion, within a very short time a highly important process of appropriation or control of the means of production by the workers was set in motion, that is, a spontaneous collectivization of the country's economy.

In the case of the gas and electricity industry, there was a special emphasis on workers' control, on one hand because of its being a strategic service without which society lost its momentum and its capacity to function; and also because the main company in the sector, Riegos y Fuerzas del Ebro (a subsidiary of Barcelona Traction), was of foreign capital and run by foreigners.

In the case of Catalana de Gas y Electricidad, S.A., according to an internal report, the takeover events occurred only four days after July 18, as follows:

On July 22nd, 1936, late in the afternoon, the Company's Management was requested to appear at the premises of the thermal power plant on Calle de Mata, belonging to the Grupo de Riegos y Fuerzas del Ebro, and a representation of the same was present, who met with a Committee that said it represented the Unions (CNT, UGT, Centro Autonomista, Sindicato de Técnicos y Regional), who stated that they, together with a representative of the Generalidad, were in charge of the companies and that all the personnel

of the same, including the former directors, had to remain in their positions until further notice, but must refrain from taking any action or acting in any way, without the consent of the “controls” that were appointed and from touching “even one paper”. From that moment on, the company’s management and interests were practically seized by the “Comité Central del Control Obrero de les Empreses de Gas i Electricitat de Catalunya” (Central Committee of the Workers’ Control of the Gas and Electricity Companies of Catalonia), together with the aforementioned representative of the Generalidad, who, through the mediation of Sub-Committees and Delegates, disposed of persons and things at their discretion, disregarding in every way the opinion of the legitimate representatives of the company, who were, of course, subject to close supervision, and were gradually removed from their functions.

Meanwhile, the government of the Generalitat de Catalunya tried to ensure the continuity of the production of the factories, as well as their reorientation towards a war industry, with the creation of the Comitè d’Indústries de Guerra (War Industries Committee) on August 8, 1936. Similarly, a minimum program was created with which all the political and trade union forces that supported the Generalitat could agree. Along these lines, the Consell d’Economia de Catalunya (Economic Council of Catalonia) was likewise established on August 11, 1936.

In some cases, in order to facilitate control, the companies were grouped at different levels, but in seven cases the workers’ unions decided to form national groupings, that is, from the whole of the territory of Catalonia. Specifically in the sectors of zinc, lead, salt, refrigeration machinery, coffers and scales, as well as in the case of gas and electricity, with the creation in the latter cases of the Serveis de Gas Unificats de Catalunya (SGUC), with 25 companies, the largest of which was Catalana de Gas y Electricidad, and the Serveis Elèctrics Unificats de Catalunya (SEUC), with some 600 companies, the largest of which was the aforementioned Riegos y Fuerzas del Ebro.

The action continued in the first half of August, when workers from the five most important gas and electricity companies (Riegos y Fuerzas del Ebro, Catalana de Gas y Electricidad, Cooperativa de Fluido Eléctrico, Sociedad Española de Construcciones Eléctricas and Sociedad Productora de Fuerzas Motrices), in accordance with the Federació Catalana de Treballadors d’Aigua, Gas i Electricitat, of the UGT, and the Sindicat Únic Regional de Llum i Força de Catalunya, of the CNT, decided to create the Comitè Central de Control Obrero de Gas i Electricitat, as the maximum element of the workers’ control organization of these companies,

which very quickly decided to move from workers' control to the seizure of the companies referred to.³⁵¹

The next step, the seizure of the Catalana de Gas facilities in Catalonia, was made, according to the internal reports, on August 28, and the managing director was forced to sign the following document, after having been held incommunicado for a few hours in his office³⁵²:

In the city of Barcelona on August 28, 1936.

The members of the Comité Central del Control Obrero de las Empresas de Gas y Electricidad de Cataluña, duly authorized by the Workers' Associations they represent (CNT and UGT), and supported by the unanimous feelings of all the personnel employed in them, plus the opinion of the people of Catalonia, who continue to defend with arms the right to their political and economic freedoms.

Gathered in the social premises of the Organization CATALANA DE GAS Y ELECTRICIDAD, S.A., Avinguda del Portal de l'Àngel, no. 22, and in the presence of its representative, Ricardo Margarit, they proceed:

To the seizure, the first necessary step for the nationalization of this exploitation and its controlled organizations, attached and subsidiaries, established in the National territory, necessary, in the very serious moments we are now experiencing, TOTALLY controlling in this way its ECONOMIC and INDUSTRIAL functioning, leaving for the opportune moment the discussion of the interests that could be considered injured by this seizure.

And for the record, we are stamping the Minutes in Barcelona on the day of the above-mentioned date.

Comité Central del Control Obrero de las Empresas de Gas y Electricidad
 UGT - CNT - CADCI - SGTC
 Barcelona

Later, some Serveis Unificats de Gas and other electricity services were separated more clearly. On October 24 the Generalitat finally published, after a laborious gestation, the Decret de Col·lectivitzacions i Control Obrer d'Indústries i Comerços (Decree of Collectivizations and Worker Control of Industries and

351. Castells (1993), p. 218.

352. Original document in Catalan.

Commerce), which involved a process of compulsory collectivization for companies with more than 100 workers, and only in certain cases for the smallest ones.³⁵³ It was an intermediate step between the nationalization that some wanted and the unionization desired by others. The scheme was a self-management regime where the power was held by a workers' business council to which the director depended, and with the assistance of an inspector of the Generalitat. The excuse was the "abandonment of their posts by the bourgeoisie".

In April of 1937 the Comitè Central de Control (Central Supervisory Committee) was transformed into the Consell General de les Indústries de Gas i Electricitat, and gas was placed under the Consell de la Indústria del Gas, structured into four sub-groups: Catalana, Riegos, Mansana, and the Vilanova and Vilafranca gasworks.³⁵⁴

The Intervention of the Generalitat (1937) and the Ministry of Finance and Economy (1938)

In May of 1937, the so-called May events took place, a series of serious confrontations in Barcelona between the communists of the PSUC, who were inclined to win the war first and then carry out the revolution, with the anarchists of the FAI, who wanted to carry out the revolution first at all costs. The situation reached a level of confrontation that produced the intervention of the central government to restore and control public order, weakening the authority of the Generalitat and the necessary unity of action of the political forces of Catalonia in those difficult moments.

By now, little was left for workers' control. The Generalitat decided to directly intervene in the unified electricity services on October 5, 1937, followed with the intervention in gas services on October 26, 1937, and appointed a Supervisory Commission to develop the management. The situation after November 1, 1937 reached became even more complex with the transfer of the government of the Republic of Valencia to Barcelona, the city where the Catalan government, the Basque government and the central government coexisted at that time. A few months later, the government of the Republic decided to intervene and created the Comisariado General de la Electricidad (General Commission for Electricity) on April 15, 1938, with the responsibility of heading the management of electricity companies in Catalonia. The gas sector followed the same path with a decree of May 25, 1938.

353. Moyano (2012), p. 2.

354. Castells (1993), p. 226.

The Order of the Ministry of Finance and Economy of July 25, 1938, published in the *Gaceta de la República* on July 27, 1938, implemented the intervention, although indicating that it was provisional, with the following justification: “It is in the interest of the state, at the present time, to ensure effectively the normal functioning of public services and, in particular, that of those which, like the manufacture of gas, are necessary to duly meet the needs of the war. Following this criterion, all the gasworks in the loyal zone have already been intervened by this Ministry, with the exception of those located in the Catalan region, and since the state is directly in charge of the acquisition and distribution of the coal they use as their primary material, it is necessary to extend this intervention to the latter” (Table 48).

Table 48. Existing gasworks in Catalonia under state intervention (1938)

Company name	Location and plants
Catalana de Gas y Electricidad, S.A.	Barcelona (Barceloneta gasworks, El Arenal and Sant Martí)
La Propagadora del Gas, S.A.	Badalona, Terrassa, Premià de Mar
La Energía, S.A.	Sabadell
Riegos y Fuerzas del Ebro, S.A.	Igualada, Tortosa
Energía Eléctrica de Cataluña	La Garriga
Alumbrado de Poblaciones, S.A.	Arenys de Mar, Girona
Gas Mansana, S.A.	Manlleu, Manresa
Gas de Vilafranca, S.A.	Vilafranca del Penedès
Energía Eléctrica de Cataluña	La Garriga
Alumbrado de Poblaciones, S.A.	Arenys de Mar, Girona
Unión Industrial, S.A.	Vilanova i la Geltrú
José Planas	Sitges, L'Arboç
Gas Mataró, S.A.	Mataró
Gregori y Cía.	Figueres
Palahí y Cía.	S. Feliu de Guixols
Viuda de Juan Cascante	Vendrell
Gas Reusense	Reus

Source: *Orden Ministerio Hacienda y Economía* (25-07-1938).

During the seizure process, the company's management was still in Barcelona, although it was finally able to move to the gasworks in Seville from where it followed the conflict, the managing director, Ricardo Margarit Calvet, as well as José M.^a Colomer, its secretary establishing themselves in the building at Calle de Rivero 6 and 8 in Seville.³⁵⁵ The facilities in Seville operated normally during the conflict.³⁵⁶ The managing engineer of the Seville facilities at that time was José Formica-Corsi Cuevas, who had been appointed by José Mansana Terrés in 1924, and would hold his post until his death in 1954.

As for the Board of Directors, it seems that it only managed to meet once during the three years of conflict, specifically on March 15, 1938 in Seville, where it was agreed, among other things, to move the headquarters from Barcelona to Seville and to invalidate all the agreements and decisions taken in relation to the interests of the company by persons outside its Board and Management, and the following resolution was taken: "The Board of Directors does not recognize the validity or effectiveness of any agreements, powers, representations, acts and contracts that may be exercised, held or formalized in non-liberated Spanish territory, subject to the control of the authorities of the so-called government of Barcelona (Valencia and Madrid previously); nor does it recognize any acts, contracts and personal or delegated actions that may have been exercised abroad by persons acting by virtue of delegation or representation conferred by elements that attribute to themselves social representation in the territory not yet subject to the control of the Spanish national authorities".³⁵⁷

Raw Materials and Plant Operations

Before the conflict, Catalana de Gas y Electricidad used coal from Asturias as its raw material, supplied by its subsidiary, the Compañía Anónima de Carbones Asturianos, whose control had been assured in 1923 to protect the company from the kind of coal supply problems that had occurred during World War I.

However, with the outbreak of the war and the division of Spain into two, the coal from Asturias had great difficulty in reaching Barcelona, as it either had to pass overland through territory controlled by General Franco's troops, a decidedly

355. Ricardo Margarit's difficult journey from Barcelona to Seville was aided by some of the company's workers, who were of anarchist affiliation but who distanced themselves from the use of violence.

356. González García (1981), p. 196.

357. NFHA.CGE. *Consejo de Administración* (15-03-1938).

impossible undertaking, or to arrive by boat, on a complicated journey of many nautical miles through zones clearly also controlled by the enemy.

During the first months of the war, when supply of coal from Asturias fell, it was first replaced, strangely enough, with German coal, next with English coal and then with Russian coal, and some additional use was made of Catalan lignite.

The coal supply problem affected the gas industry much more than the electricity industry, since at that time the largest share of electricity production came from hydroelectricity and not from coal-fired power stations. The price of coal practically multiplied fivefold from before the conflict until August of 1936, while the selling price of gas did not increase, which quickly generated losses for the Serveis de Gas Unificats de Catalunya, losses that had to be covered by the Serveis Elèctrics Unificats de Catalunya, which were in a much more balanced situation.³⁵⁸

The following year, 1937, the situation became more complicated: in the gasworks, Spanish coal practically disappeared at the end of the year, with the progressive use of the lowest quality lignite; German and Russian coal were no longer available; English coal continued to arrive, and Polish coal appeared on the scene. It should be kept in mind that the best way to circumvent the maritime surveillance of Franco's warships was to sail under the flag of a country that was not formally in the conflict, which gave a certain logic to the disappearance of the German and Russian flags. The situation of need was also noted in the appearance, for the first time, from olive *orujo* as a raw material, produced from the residue recovered after pressing the olives.

In summary, the emission of gas from the gasworks in Barcelona fell by 24 % in 1937 compared to 1936, while coke production fell by 65 % compared to the previous year, clear signs of the recession in consumption and the absolute degradation of the raw materials used.

The situation stabilized in 1938 to a certain extent with the almost exclusive use of English coal, with no consumption of lignite or *orujo*. However, gas emissions continued to fall, by 14 % compared with 1937, but the improvement in raw materials led to a significant 44 % increase in coke production, even if consumption was reduced.

In 1939, when the war in Barcelona ended in January, consumption clearly recovered; for the year as a whole it grew by 31% compared to 1938, which was

358. Castells (1993), p. 229.

already 85% of the figure for 1936. However, the quality of the raw materials fell again, as English coal was quickly replaced by Spanish coal, and lignite and *orujo* appeared again. The beginnings of the harsh post-war period began to be visible.

The Difficult Post-War Period

With the city of Barcelona occupied by General Franco's troops at the end of January of 1939, almost immediately, on February 17, Catalana de Gas y Electricidad held its first meeting of the Board of Directors after the conflict in its Barcelona headquarters. The issues to address were important, as it was necessary to regain control of the company's main assets after almost three years. The first point was the analysis of the situation of the facilities and the definition of the work plan to be carried out in order to put them "in due condition".

The process of investigation and purging of the personnel also had to be initiated, in accordance with the new government's provisions, and a commission was created for this purpose, chaired by the cavalry captain Luis Valderrábano. In spite of everything, in a demonstration of personality and character and in an attempt to minimize the effects of the situation, the Board ratified the deputy administrative director of the company, Ramiro Delgado, the chief engineer, Luis Marquet, and the heads of service who had continued to work in Barcelona during the confrontation. This action had its consequences and the manager, Ricardo Margarit, had to defend himself when he was denounced as an alleged mason. In short, there were denunciations and officiousness of all kinds.

On the other hand, given that the legal provisions did not allow for the collection of the receipts for the years of the war, steps had to be taken swiftly to manage the necessary credit operations that would allow the complex economic situation of the company to be handled in an agile way.

The post-war years were hard, very hard; the service capacity had to be rebuilt, but the problems and economic hardship were truly serious. The basic raw material, coal, which the company brought to Barcelona from its mines in Asturias, from the subsidiary CA de Carbones Asturianos, was seized by the authorities upon arrival in Barcelona and used for other purposes that the new authorities had decided were priorities, and which were basically the railways.

In the kilns of the gasworks, all kinds of materials were burned, including hazelnut shells, rags, wood, etc., which produced poor quality gas. Moreover, the

combustion of such varied and unsuitable raw materials led to other products, such as acetic acid, going into the distribution networks with the gas, which adversely affected the pipeline network and led to corrosion. The restrictions that affected electricity also existed in the gas industry, and thus, in 1941 there were only about a thousand customers with service in the area of Barcelona, and it was not possible to resume service to all customers until 1951.

The company also began to have political problems with the new authorities because of its company name, which, by including the word *Catalana*, made it suspect of almost anything. The situation had to be managed very delicately in order to be able to continue activities normally. The main difficulty was the pressure to change the name of the company, which the company was unwilling to do under any circumstances; the matter was only resolved in extremis with intervention from high spheres of the regime³⁵⁹, and thus the historic name of the company was maintained.

Throughout the entire country, the economic and industrial situation was very difficult, the lack of exports generated a lack of foreign currency to be able to carry out the necessary imports of machinery, and thus break the negative cycle. What would later become major funding channels, remittances from Spanish emigrants in Europe and tourism, simply did not exist. In this context, ideology and reality led the regime to an industrial policy based on autarky and import substitution, which reached unimaginable limits. The Franco regime acted basically on the industrial issue through four instruments:³⁶⁰

- The *Secretaría General del Movimiento* (General Secretariat of the Movement), derived from the former organization of the Falange of José Antonio Primo de Rivera. It was incorporated as a Ministry in 1939 to clearly introduce the Falangist ideology of social revolution, and gave the state a pre-eminent role over other organizations and citizens.
- Trade unions, created as corporate trade unions, where employers and workers met in the same organization, within the different branches of activity, with compulsory membership.
- The *Instituto Nacional de Industria* (INI), created in 1941, for the industrialization of the country and the substitution of imports. Strangely enough, it was located in

359. According to oral tradition, contact was made with Ramón Serrano Suñer.

360. González González (1979), p. 29; Fàbregas (2017c), pp. 2-3

the Executive branch, instead of Industry, with the illustrious Juan Antonio Suanzes as president.³⁶¹

- The Ministry of Industry, perhaps the least significant of the above-mentioned bodies. It should be remembered that Juan Antonio Suanzes added Minister of Industry to his position at the INI in the period 1938-1939 and 1945-1951.

This entire framework led to situations that were difficult to fit in with current parameters, such as investment in the oil shales of Puertollano (1952); or the agreements of a Consejo de Ministros in 1956, at the proposal of the Minister of Labor, José Antonio Girón de Velasco, which approved an immediate 23% salary increase, when the same government did not allow an increase in the sale prices of companies. In short, investments without economic calculation and decisions that condemned companies to hardship in a decadent environment.

The industrial strategy of Catalana de Gas y Electricidad at the time was to update the Barceloneta and Sant Martí gasworks and close the small gasworks — Sabadell, Terrassa, Badalona and Premià de Mar —, supplying them from the Barcelona gasworks by means of pressure pipelines built ad hoc, at the time called feeders. This approach resulted in corresponding economies of scale and service improvement. The closure of the gasworks and the new supply was carried out in the years 1939-1941, so that the subsidiary companies that owned the gasworks, that is, La Propagadora del Gas and La Energía, leased their businesses to Catalana de Gas y Electricidad.

Once Again, Investments in Electricity: Pere Duran Arrives

In the post-war period, the supply of energy presented serious difficulties, both due to the problems of national coal production and the impossibility of importing oil due to the lack of the necessary foreign currency, a circumstance produced by the international isolation of Spain because of its political regime. Things got even worse when, in 1944-1945, the country suffered one of the most severe periods of drought endured for many years, which created the colloquial expression of the *pertinaz sequía* (persistent drought), blamed for almost everything at that time.

361. De Suanzes was said to be: "a servant and defender of the interests of the state as an autonomous entity and distinct from its citizens". Schwartz and González (1978), p. 16.

The situation was serious; in 1940, almost 80% of the installed electrical power depended on water. As a result, power outages and electrical restrictions appeared, affecting more than 20% of consumption in 1945 and 1949. This caused serious problems for the electricity companies; if they had thermal power, there was a lack of coal, but if they had hydraulic power, there was a drought. As a result, a new wave of hydroelectric power plants and the creation of electricity companies was generated. In this context, Fuerzas Eléctricas del Noreste, S.A. (Fenosa), currently incorporated into Naturgy, was created in 1943, and Hidroeléctrica de Cataluña, S.A. (HECSA), in 1946, was promoted by Catalana de Gas. In the case of Catalonia, INI also set up the Empresa Nacional Hidroeléctrica del Ribagorzana, S.A. (ENHER) in 1946, which, oddly, would be the only state intervention in the field of hydropower in the whole country.

A New Chairman: Juan Bertrand Mata (1945)

In 1945, the chairman of Catalana de Gas, Eusebio Bertrand Serra, passed away; he had held the post since 1923. He was replaced by his son Juan Bertrand Mata, who would hold the post for twenty years, until his death in 1965. The new chairman was only 37 years old when he was appointed, and he represented a new generation that would have to face the transformation and modernization of the company. Juan Bertrand was a major textile entrepreneur who led Textiles Bertrand y Serra and its sizeable group of companies, and was also the vice-president of the Banco Vitalicio de España.

At that time, Juan Lladó, the CEO of the Banco Urquijo³⁶² since 1944, and also the true author of the 1942 Las Jarillas Pact that brought Urquijo definitively closer to the Banco Hispano Americano, was trying to create networks of interests in Spanish territory to ensure the growth of the bank and its significant participation in the new industrialization processes of the country. He had already reached agreements with the Aznar family in Bilbao and the Benjumea family in Seville.

The interests of a young chairman and a good banker coincided and Juan Bertrand became the Catalan partner of Juan Lladó, and joined the Board of Directors of the Banco Urquijo and the Banco Hispano Americano, which partnered with Catalana de Gas in the creation of a new electricity company, which was called

362. Juan Lladó's Banco Urquijo would be the country's industrial bank; it was present in practically all the basic sectors of the economy, including gas and electricity.

Hidroeléctrica de Cataluña, S.A. It was dedicated to the construction of new hydroelectric power in the Pyrenees and the Ter, taking advantage of the hydroelectric concessions obtained by Catalana de Gas before the Civil War. This proximity led Juan Bertrand to participate on the boards of Catalan companies in which Urquijo had a stake, such as La Maquinista Terrestre y Marítima.

Juan Bertrand was the person who had confidence in Pere Duran Farell, who would replace Bertrand as chairman after his death in 1965. In those years, the Board appointed new members, Manuel Bertrand Mata, Juan's brother, and Miguel Mateu Pla, who had been mayor of Barcelona in 1939 and ambassador of Spain in France, as well as being the owner of the publishing company of the *Diario de Barcelona* and the EFE Agency. Another board member was Ricardo Margarit Calvet, who continued as managing director and, over the years, managed to join the Board like his predecessor José Mansana.

Finally, it should be noted that in 1946 there was a new change of Statutes. The most relevant point was the modification of the duration of the company, which went from the previous forecast of ending its activity in 1950, to establishing an indefinite duration.

Hidroeléctrica de Cataluña and the Banco Urquijo (1946)

In Catalonia, after the Civil War, in the electricity sector there were essentially only two groups, Barcelona Traction — which operated through Riegos y Fuerzas del Ebro — and Catalana de Gas, which used the Compañía de Fluido Eléctrico. The two companies were the only ones based in Catalonia that participated in the creation of the Spanish electricity sector employers' association in 1944, the Unidad Eléctrica, S.A., known as UNESA.

Catalana de Gas y Electricidad (CGE), as explained above, had leased its electricity assets to the Compañía de Fluido Eléctrico in 1929 and thus abandoned the direct management of its assets in the electricity sector. In 1942, the Cooperativa de Fluido Eléctrico, S.A. became the Compañía de Fluido Eléctrico, S.A. (CFE), in order to develop its business activity more widely. However, supply difficulties and the post-war crisis dragged the CFE into a situation of serious financial crisis that had only managed to avoid serious consequences after the decisive intervention of Catalana de Gas in 1945, which took control of the company and provided the corresponding financial support. The compensation was a new agreement to lease CGE's assets that was very hard for the CFE, which practically placed the total control of the company's decisions in the hands of Catalana de Gas.

But the new situation of electrical restrictions generated opportunities for the construction of new power plants and new falls that would help to balance the supply and demand of electricity in the country. In this context, on June 29, 1946, CGE held 53% of the capital, and a ten-year syndication agreement was signed between the shareholders between the Urquijo and Hispano Americano banks and Hidroeléctrica de Cataluña, S.A. (HECSA). Ricardo Margarit, the managing director of CGE, was appointed chairman of the new company.

The new company truly began its operations in 1947 when it hired Pere Duran Farel³⁶³ as an engineer to build the new falls. Pere Duran had finished his studies at the Escuela de Ingenieros de Caminos, Canales y Puertos de Madrid that same year, and had developed some activities for the Banco Urquijo. At that time, Pere Duran's main hobby was to provoke artificial rain by bombarding the clouds with carbon ice and other materials. It would take him only 13 months to be appointed chief engineer of the company. From the beginning, José María Lozoya Augé accompanied him on his journey as head of administration and legal affairs, sharing problems and opportunities with him for many years.

The situation of the electricity sector in Catalonia, however, was strongly altered when Joan March Ordinas managed in 1948 to have Barcelona Traction (BT) declared bankrupt in a Reus court, creating the consequent disorder in its entire group, and more so in the main company, Riegos y Fuerzas del Ebro. The constitution by March of Fuerzas Eléctricas de Cataluña, S.A. (FECSA) in 1951, to participate in the awarding of the assets of Barcelona Traction, and the auction and final awarding of the contract which it won on January 4, 1952, brought the strategy of the Mallorcan financier to a successful conclusion.

HECSA concentrated its efforts in the first years on the construction of a six-falls system on the Pallars Subirà, in the Noguera Pallaresa basin, with a power of 78,000 hp. These were the falls of Lladres, Espot and Torrassa in 1953, that of Sant Maurici the following year, and those of Unarre and Esterrí in 1958. The Sant Maurici, Espot and Torrassa plants were inaugurated by General Franco during a visit to the Pyrenees in the autumn of 1955, where Pere Duran had the opportunity to meet him and explain his theories on the artificial rain and how this could help to provide the country with the water so necessary to overcome the "persistent drought".

363. Fàbregas (2014b), pp. 34-38.

A New CEO at HECSA: Pere Duran (1956)

Although the technical aspects of HECSA worked reasonably well, the dynamics among the partners were strained by the magnitude of the necessary investments and the lack of control by the banks over the Compañía de Fluido Eléctrico (CFE), which was the company that actually had customers and sold electricity. The arrangement was that HECSA made large investments with its three partners, and sold the electricity to CFE, in which the banks did not participate, and in which Catalana de Gas was clearly in charge, thanks to the lease of its electric assets and mainly because the chairman of CFE was the managing director of CGE, Ricardo Margarit.

The situation became progressively tenser and did not improve, although in 1953 CFE shares were transferred from La Catalana to HECSA, at the request of the banks. At the Compañía de Fluido Eléctrico, the will of the company was not formed by its shareholders, but by the holder of the lease contract who was Catalana de Gas. But the banks could put pressure on them by not helping to finance the large new investments. Finally, an agreement was reached in the early months of 1956, when the banks committed to financially supporting HECSA's growth and construction program. The counterpart was the reorganization of the companies by appointing Pere Duran Farell, who was 35 years old³⁶⁴, as CEO of HECSA, and by demanding CGE, HEC and CFE to work together in a Coordination Committee chaired by Juan Bertrand Mata, board member of the Urquijo and Hispano Americano banks, as previously mentioned. In short, Juan Bertrand and Pere Duran advanced and Ricardo Margarit retreated; it was only the first act, the second one would take place in a few years in Catalana de Gas directly, and it would be the beginning of a new stage of great development in gas with the modernization of the gasworks and the introduction of natural gas by Pere Duran.

364. Fàbregas (2014b), pp. 41-47.

1955-1975

From City Gas to Natural
Gas

The second half of the 1950s was a time of great change and of new horizons. The initial construction of the European project with the signing of the Treaty of Rome in 1956 would clearly determine the future. In Spain, the Stabilization Plan of 1958 and the release of the peseta exchange rate initiated the exit from the post-war economic autarky by pointing to the path of development of the 1960s, guided by the conclusions of the 1962 World Bank report. In these years, the gas sector in Spain would make the great technological change: it went from city gas to natural gas.³⁶⁵

Changes in the Surroundings: Nuclear Energy, Natural Gas, Butane, Algeria

The Beginnings of Nuclear Energy (1955) and Natural Gas (1956)

The importance of the city gas industry in Europe and the lack of its own deposits had not allowed the development of natural gas, which had been used in the United States since the 19th century. But the situation began to change rapidly after World War II, with the discovery of exploitable natural gas reserves in Italy (Po Valley, 1949), France (Lacq, 1951), Algeria (Hassi R'Mel, 1956) and the Netherlands (Groningen, 1959), and later in the North Sea, both British and Norwegian.

The advance of cryogenic techniques also allowed the transport of natural gas to be considered in the 1960s, with two alternatives: by gas pipeline or the methane tanker, thus adding flexibility to the system. LNG carriers transport the gas at 160 degrees below zero, so that the volume transported is reduced by 600 times, making it possible to optimize the movement of gas according to the distances. The progressive ecological awareness that would appear over time would also positively stimulate the use of natural gas, the cleanest and least polluting of all fossil fuels, with clear advantages over coal and oil.

In the 1950s, on a parallel trajectory, nuclear energy for peaceful purposes began its journey and achieved a position in the energy market: the first orders for nuclear reactors for commercial power generation were placed in 1955: one for the 200 MWe Dresden (Illinois) power plant, commissioned from General Electric with

365. Historically, city gas or manufactured gas was the name given to the gas produced in a gasworks mainly from coal or naphtha, while natural gas is found in nature, hence its name. Natural gas is not manufactured, is extracted from gas fields or associated oil and gas fields and is transported to markets.

its boiling water technology (BWR), and another 175 MWe for the Yankee plant (Massachusetts) using the competing technology, the Westinghouse pressurized water (PWR) plant. In 1960, only five countries in the world had nuclear technology.

The two innovations, both natural gas and nuclear energy, came to Spain in the 1960s. Nuclear energy, in 1968, with the José Cabrera power plant of Unión Eléctrica Madrileña (UEM), in Almonacid de Zorita (Guadalajara); while, in the case of Catalonia, the first nuclear power plant was that of Vandellòs (Tarragona), connected to the grid in 1972 and promoted by HIFRENESA (Hispano Francesa de Energía Nuclear, S.A.). Natural gas was introduced into the country in 1969 through the Barcelona plant of Gas Natural, S.A. (GENESA)³⁶⁶, importing liquefied natural gas from Libya. At that time GENESA and HIFRENESA were in the orbit of Catalana de Gas y Electricidad, now Naturgy, which incorporated Unión Fenosa, the successor to UEM, in 2009.

The Appearance of Butane in Spain (1957)

Within the context of evolution and change, a relevant event was the creation by the state of the company Butano, S.A. (1957), to market and distribute butane and propane, as bottled gas in the well-known cylinders, throughout the Spanish territory, within the scope of the Monopolio de Petróleos (Petroleum Monopoly). The shareholders of the new company were divided 50% between the Refinería de Petróleos de Escombreras (REPESA) and the Compañía Arrendataria del Monopolio de Petróleos (CAMPSA). The concept of the petroleum monopoly, so deeply rooted in Spain since its creation by Calvo Sotelo during the dictatorship of Primo de Rivera in 1927, still maintained its full force at this time, although it was already difficult to explain within a democratic Europe.

The new product was a residual refinery gas, at the time with no commercial utility and a marginal cost of practically zero. Its introduction was very successful, as piped gas service was not widespread and was of a questionable quality due to the problem of the lack of adequate coal in quantity and quality to produce it. On the other hand, the advance from cooking with coal to cooking with gas was evident. In just ten years, butane managed to capture six million customers in Spain. Some reflection should be made here to understand the motivations that led to

³⁶⁶ Gas Natural, S.A., and Gas Natural SDG, S.A. should not be confused. The first was created in 1965 as a subsidiary of Catalana de Gas to bring natural gas to Spain through the regasification plant in Barcelona, and the second comes from the change of name, made in 1992, of Catalana de Gas, S.A., by absorbing by merger Gas Madrid, S.A., which is the company that now uses, as a trade name, the name of Naturgy.

the fact that while developed countries were oriented to piped natural gas, Spain opted for gas derived from petroleum (LPG) and furthermore supplied as bottled gas. Over the years, the situation would be reversed.³⁶⁷

The Spanish gas industry had reached this period with outdated installations, most of them from before the Civil War, and without having been able to carry out the necessary renovations and improvement processes due to the general situation of economic hardship that kept it from being able to make large investments or import the necessary materials. The problem of raw materials, quality of service, and the need for modernization completed the frame of reference. In this context, the appearance of butane on the market made the situation unsustainable, leaving the gas companies only two options: either disappear, a path taken by a large number of gas companies in the country; or reinvest, make the technological leap and prepare for the future, competing and fighting for the market. Catalana de Gas y Electricidad would clearly choose the second option.

France's Projects in Algeria: ASSEMI (1960)

France, which had been defeated in Indochina in 1954, set out to carry out an important task of economic development in Algeria, still a *department* of France, stimulating industrial investment and promoting the participation of European countries. However, the creation, among other initiatives, of the ASSEMI (Association Eurafrique Minière et Industrielle) on January 1, 1955, promoted by General George Georges-Picot³⁶⁸, Erik Labonne and Louis Armand, arrived a little late: the previous year the FLN (National Liberation Front) had been formed and the war for the liberation of Algeria had begun, which would finally achieve its independence in 1962.

The ASSEMI brought together private industrial companies from Germany, Belgium, Luxembourg, Holland, Switzerland and Italy, at the level of the Société Générale de Belgique, Brown Boveri or Fiat, in other words, industrial companies or banks with a strong investment focus in industry. However, ASSEMI's initial industrial development projects changed radically when the Hassi R'Mel natural gas fields were discovered in 1956, with a volume of reserves that placed them among the most important in the world.

The possibility of transporting Algerian gas to Europe became a priority, with the aim of bringing the gas to Essen, in the Ruhr basin in Germany. Over a

367. Fàbregas (2017c), p. 8.

368. Fàbregas (2001), pp. 69-72; Fàbregas (2014b), pp. 46-51.

period of three years, two alternatives were developed, a pipeline passing through Morocco and the Strait of Gibraltar, and the other, with an underwater section Oran-Cartagena, directly reaching Spain. Whichever the case, the pipeline had to pass through Barcelona, Avignon and Strasbourg. The route was about 3,000 kilometers long and the budget was between 30,000 and 35,000 million pesetas.

In this context, events accelerated and in February of 1959, Maurice Lemaire, former French Minister for National Reconstruction and member of the Council of Europe, presented the Eurofrigaz project in Spain, as the Algeria-Germany gas pipeline project was called. He explained the extreme external dependence on energy in Europe and the lack of basic energy such as natural gas.³⁶⁹ At the same time, another project to transport liquefied natural gas from Algeria to the United Kingdom was being promoted in the early 1960s with the creation of CAMEL (Compagnie Algérienne du méthane liquide) to build a natural gas liquefaction plant at Arzew on the Algerian coast, which was to be completed in 1963. The British importer was the British Gas Council.

The Banco Urquijo was admitted to the ASSEMI on June 27, 1960, appointing Jaime Mac-Veigh Alfós and Pere Duran Farell as its representatives. At that time³⁷⁰, within ASSEMI, there was already a Comité Industriel Européen pour l'utilisation du gaz du Sahara (European Industrial Committee for the Use of Gas from the Sahara), which was simultaneously promoting the Eurofrigaz project, connecting Algeria and Germany through Spain via the submarine section from Mostaganem to Cartagena; and also the Tun-Ital-Afrigaz project, to connect Algiers via Tunisia with Sicily and southern Italy. The Eurofrigaz project was being designed to transport 10 billion cubic meters per year, of which it was thought that around 1 billion could remain in the Spanish market.

Catalana de Gas y Electricidad joined the Gas Committee in November of 1960 as a Spanish gas company. The Committee already included: Rhurgas, Distrigaz, Societa' Italiana del Metano (SOCIM), Montecatini, and Gaz de France with its subsidiaries Comes and Semarel.

In short, from 1960 onwards, Catalana de Gas, through the Banco Urquijo and Pere Duran, participated in one of the most exclusive clubs in Europe to advance the gasification of the continent with Algerian gas. The horizons of change and adaptation of Catalana de Gas to the new realities were approaching. Duran drew

369. Fàbregas (2017c), pp. 9-10; Suárez Candeira (1988), p. 346.

370. NFHA.PD. ASSEMI.

close to gas and also to the Algerian leaders, for example Abdelaziz Bouteflika, with whom he would always maintain an absolutely privileged personal relationship of trust and proximity.

The following years were very complex for Algeria: the war of liberation worsened with the serious events of the *pued noirs*, the plot of the generals in Algiers in 1961, the appearance of the OAS, years of fierce struggle, terror and much pain. No solution to the situation was found until Charles de Gaulle regained power in France, created the Fifth Republic (1958), and led the matter to Algeria's declaration of independence in 1962. But all this drastically changed the Algerian gas reference framework for a few years.

Pere Duran and the Transition from Coal to Naphtha

If in the 1940s and 1950s the emphasis of Catalana de Gas had once again been on electricity, with the creation and development of Hidroeléctrica de Cataluña, in the early 1960s the company's focus returned to gas. The need for modernization after so many years, the appearance of butane as a new competition, the dawn of natural gas on the horizon, all called for a major change of course, of adaptation, of growth and development. For Catalana de Gas, the priority of investments was again on gas and its important development possibilities, and it defined electricity investments as subsidiaries.

The new leap forward for Catalana de Gas was difficult for Ricardo Margarit to make. The managing director had been in the position for almost 30 years, and had made great contributions to the company, but the future would be different, and at the age of 77 it was difficult for him to be the person of the new future. There had also been friction between the banks and Margarit in respect to HECSA, and Chairman Juan Bertrand had had to arbitrate in order to defuse them, as explained above.

Bertrand's vision was to position Pere Duran Farell, the brilliant civil engineer who had built the new HECSA plants, and who was only 40 years old, as the new chief executive of Catalana de Gas. He was well-connected to the Banco Urquijo and the Banco Hispano Americano, was a brilliant strategic thinker, had a great capacity for personal seduction³⁷¹, and was at that time the CEO of HECSA.

371. Fàbregas (2014b), pp. 52-56.

The process of change, fraught with complexities, lasted a few months throughout 1961, but Pere Duran Farell was finally appointed chief executive officer of the company, while Ricardo Margarit was appointed vice-president without executive duties. During his long term in office, Margarit stressed that he had maintained “the industrial and independent character of La Catalana, without any kind of mediatization, despite the numerous difficulties that the company had experienced due to external causes, and I wish to express my confidence that this character can also be maintained in the future”.³⁷² The special emphasis on Margarit’s industrial and non-financial activity and vision continued and his undying defense of the independence of the company. Probably his vision of Pere Duran was that he was more a representative of the interests of the banks than a true industrialist. Time would prove him wrong.

The renovation of the gasworks in Barcelona posed the dilemma of whether to continue with the traditional coal-based process, or to start a new one with the latest technologies available based on liquid fuels. This second route was chosen on the basis of experiences with the first production line in Spain based on petroleum products, carried out at the Sant Martí gasworks in 1956, and using catalytic cracking of fuel oil. With all this, a plan was developed for the elimination of coal from the Barcelona gasworks: Barceloneta and Sant Martí. The El Arenal gasworks had already been closed in 1958.

The new gasworks would be based on catalytic cracking of light naphtha, with French ONIA-GEGI technology lines, for a global production of 500,000 cubic meters/day of 4,200 calories of gas, with an initial forecast that they could be in service by the end of 1962. This technology transformed the gasworks into chemical plants, practically automatic, operating from an abundant raw material, naphtha, a light gasoline. The process allowed for great automation and therefore very low requirements in respect to production personnel. However, no by-products were obtained that could be monetized to aid economic performance, as had traditionally been the case with coke in coal-fired plants. They also required significant investments and were a technology unknown in Spain. Despite the risks, the project was launched and the new gasworks in Sant Martí began operating in 1963 and the Barceloneta gasworks in 1964.³⁷³

372. NFHA.CGE. *Consejo de Administración* (27-03-1961).

373. Falgueras (1969), pp. 63-65.

With these changes, the entire coastal area of Barcelona ceased to receive constant shipments of coal. Some very classic, but also very demanding jobs, such as the stoker's work, also disappeared. The transition was from systems born in the 19th century, maintained for more than a hundred years, to modernity, which led, however, to major programs of readjustment of personnel and a reduction of staff, conducted within the context of programs of technological unemployment.

The change was not just about modernizing the gasworks, but was a whole program of actions to capture the synergies of the changes, and to advance in a more competitive culture and business systems that would allow for a rapid profitability of the important investment made in the gasworks, adding growth and efficiency to all the actions.

The new capacity of the gasworks allowed, for the first time in many years, to grow in sales and customers, but this required the development of the marketing aspect of the organization. Marketing appeared in Catalana de Gas some 30 years earlier than in the traditional electricity companies, which did not compete for the market. New uses of gas, mainly heating, were also promoted. The process of cost efficiency and capture of synergies advanced in 1962 with the installation of the first computer in Spain, of the second generation, an IBM 1401, which made modernization possible of existing administrative processes and increased management efficiency.

The preparation for future growth involved the acquisition of various gasworks and companies: the Industrial Union of Vilanova i la Geltrú, J. Planas Robert de Sitges and the FECSA gasworks in Mataró in 1963, as well as the Manresa gasworks of Gas Mansana in 1964.³⁷⁴ The possibility of building a gas pipeline along the Mediterranean coast from Algeria also made it advisable to take up positions, acquiring the controlling stock in 1964 of the Compañía Española de Electricidad and Lebon Gas, which was listed on the Barcelona stock exchange and had operations in Valencia, Murcia, Malaga, Granada, Cadiz and Santander. Studies were also initiated to make natural gas available in Spain, which was already seen as the future alternative to gas from gasworks (Table 49).

Within a few months, Pere Duran structured a new organization and a new management team, and reviewed and redirected most of the company's difficult issues. The revolution and change were underway, with momentum and at high speed, and all that was needed was to achieve the expected results. In 1965, the

374. Sudrià y Aubanell (2017), pp. 90-97, 103-112 and 127-129.

Table 49. Catalana de Gas y Electricidad. Organizational structure (1961)

Name	Position	Studies
Pere Duran Farell	CEO	Civil Engineer
Luis Marquet Torrents	Managing Director	Industrial Engineer
José M.ª Garriga Carbonell	Head of the Technical Division	Industrial Engineer
José Cervera Bardera	Head of the Administrative Division	Sales Manager
José Formica Corsi-Hezode	Head of the Sales Division	Industrial Engineer
Francisco Falgueras Roca	Head of Human Resources	Industrial Engineer

Source: NFHA.CGE. *Consejo de Administración* (19-10-1961).

company had reconverted its production facilities, improved the quality of its service, started looking for new customers and, in terms of the current autonomous communities, was present in Catalonia, Andalusia, Cantabria, Murcia and Valencia. Growth, acquisitions, synergies: a new and positive dynamic of action.

But the sixties were difficult years in economic terms, the overinvestment made in renovating the gasworks and in preparing for the future introduction of natural gas, and additionally, the seven years of freezing of gas sales prices by the government (1962-1969), while inflation was permanently double-digit, led to economic and financial tensions that caused gas to contribute absolute losses in the ledger books, only compensated by the lease that continued to be charged from the electricity assets. Tensions began to ease with the implementation of the dual rates in 1969, and with the development and maturation of the market due to new investments, and the introduction of innovative marketing and advertising policies, with the creation of specific rates for the promotion of new uses such as heating, at 2.60 pesetas/m³, and the progressive entry into the industrial market.

The End of an Era

The La Ribera Plan (1966)

The industrial reconversion of the 1960s led the industries that owned important plots of land on the coast of Barcelona, between Barceloneta and Sant Adrià de Besòs, and the railway line and the sea, to an analysis of the situation and the

possibilities of developing an urban development alternative for the zone; to this end, La Ribera, S.A. was established in 1966.³⁷⁵

In 1963, the important industrial premises of La Maquinista Terrestre y Marítima in Barceloneta closed down; the gasworks were also being modernized, requiring less space and could perhaps be eliminated if natural gas were to be used. In turn, Crédito y Docks was reorienting its ships and warehouses.

The industrial zone of Poble Nou was outdated and in need of transformation; there were still sizeable areas of shanties, such as the Somorrostro, and the future remodeling of railway infrastructures was planned, with the transfer of the terminus station of Barcelona from the Estación de Francia to the Estación de Sants. Likewise, the need to build the connection with Barcelona's planned urban network of toll motorway accesses had an impact on the reference framework.

The aim of La Ribera, S.A. was to open Barcelona to the sea, eliminating obsolete shanties and factories, and generating a new urbanism in those spaces. Pere Duran Farell was appointed chairman of the company, and Miquel Roca Junyent and Narcís Serra were appointed co-chairmen. The architectural project was entrusted to Antonio Bonet, who had worked with Josep Lluís Sert and Le Corbusier, and with extensive experience in Argentina, where he had designed similar types of buildings to those planned, such as the Terraza Palace building in Mar del Plata, now a National Historic Monument in that country.

The reflections made during the presentation of the project were the following: "The reality is that this area of Barcelona facing the sea has now become six kilometers of worthless land, saturated with railway tracks, scrapyards, smoke, rocks and ageing residences of the lowest quality. This fact has led us to replace the simple idea of a revaluation of these lands with that of promoting a great plan for the transformation of that area of Barcelona. That is to say, to move from a work on a private scale to one on a citizen scale. This is how the idea was born to remodel the six kilometers facing the sea, from the Port to the Besòs River".³⁷⁶

Two years later (1968), the City Council approved the project, but pressure from the residents stopped it indefinitely after an intense five-year struggle. It was not until the 1992 Olympic Games that the project to open Barcelona to the sea could be carried out, however, not by private initiative, but by expropriation and transformation of land use carried out through municipal public initiative.

375. Fàbregas (2014b), pp. 70-72.

376. Promoters of the La Ribera Plan (1965)

Farewell to Gas Streetlamps (1966)

The perspective of modernity, the unstoppable advance of technology and society's development should not make us overlook other elements, perhaps ones belonging more to the sphere of emotional intelligence. Over the course of 1966 the last streetlamps of the city's public lighting system were switched off on the Paseo de la Bonanova. Only 124 years had passed since the first gas streetlamps were lit in Santa María del Mar in 1842, with the first gas produced in the Barceloneta gasworks.

An era was coming to an end, that of gas lighting, that of the use created by industry. Over time, electricity had changed the rules of the game in this area, and gas had found new uses: cooking, hot water, heating. When natural gas arrived, large-scale industrial uses would also follow, followed by electricity generation with natural gas combined cycles.

But it should be remembered that when the gas sector began, the aim was to make the night stop being night at the will of the citizen, and this produced an advance in modernity and an important sociological change in the construction of the city and its future.

Almost at the same time, one of Barcelona's most problematic slums, the Somorrostro, which stretched along the beach from Barceloneta to Bogatell, or in other words, from the wall of the Barceloneta gasworks of La Catalana to the wall of the El Arenal gasworks of Lebon, also disappeared. This was an area of shanties without any services, which had sprung up with the immigration that had occurred during the hyperactivity of preparation for the Universal Exhibition of 1888. It was said that the great gypsy dancer Carmen Amaya was born there. The neighborhood was practically on the beach, so when the sea was rough, local residents more than once had to pick up and move to avoid being washed away by the waves.

The neighborhood survived from the last quarter of the 19th century until June 25, 1966, when, they say, naval maneuvers were to be carried out on the beach, which General Franco was to contemplate and so, days before Franco's arrival, the neighborhood was demolished and eliminated. There were still some 600 shanties left, and their approximately 3,000 inhabitants were moved into barracks, while apartments in the San Roc neighborhood of Badalona were built for them. Years later, in 1969, the Instituto Municipal de la Vivienda built the La Mina neighborhood as a destination for people evicted from different shantytowns (Camp de la Bota, Pekín, La Perona, Somorrostro, Can Tunis and Montjuïc). For many years, any

photo of the Somorrostro showed the nearby gasometers of the gasworks, and almost any general photo of the gasworks showed the Somorrostro shanties, a neighboring reality for a long time. An entire era was coming to an end.

The Spherical Gasometers of Horta (1967)

Perhaps the last important technical action before the arrival of natural gas was the construction of the Horta spherical gasometers. In order to supply gas to customers, it was not enough to have large gasworks, it was also necessary to have growing networks that could carry the necessary gas at the appropriate pressures to provide a quality service to the city. The increases in gas consumption had been spectacular since the start-up of the new gasworks and the significant stimulation of heating consumption. In the winter of 1967, on peak days, at the same temperatures, demand had grown by 30% with respect to the previous year, while consumption in 1968 as a whole had grown by 20% with respect to 1967.

For all these reasons, and already thinking about the forthcoming arrival of natural gas, at the end of the sixties it was decided to provide Barcelona with a new medium pressure gas network (4 bar), and construction began to help equalize the service pressures in the city and improve the support of peak hours, aggravated in recent years by the use of heating. Within this context, the construction of a gasometric station in Horta was planned, located on the new network, at kilometer 10 of the road from Horta to Cerdanyola, a critical point for the network, but also of high visibility from the city because it was in an open area on a mountainside, which caused some problems with public opinion. Appropriate permits were applied for in March of 1967; the facility, which included two spherical gasometers, was built and started operating at the end of December of 1967.

The gasometers were in operation until the definitive introduction of natural gas into the city allowed for other technical solutions. Both the land and the facilities, which were already out of service, were transferred to Barcelona City Council on December 18, 1985, with all the assets transferred in preparation for the 1992 Olympic Games. The gasometers were finally demolished in 1991.

The Last Gasworks (1842-1979)

With the advent of natural gas, an entire era of the gas industry in Spain was beginning to come to an end; the future would be one of a new energy source, natural gas, for which neither coal nor naphtha manufacturing facilities were

Table 50. Existing gasworks in Spain (1842-1979)

Autonomous Community	1842	1861	1901	1958	1969	1979
Catalonia	1	11	33	21	15	14
Andalusia	—	4	15	6	3	3
Valencian Com.	—	1	8	2	1	1
Balearic Islands	—	1	6	3	1	1
Castilla y León	—	1	3	1	1	1
Galicia	—	1	3	1	—	—
Murcia	—	1	3	2	1	1
Asturias	—	1	2	2	2	2
Basque Country	—	1	2	2	2	2
Aragon	—	—	1	1	1	1
Cantabria	—	1	1	1	1	1
Castilla-La Mancha	—	—	1	—	—	—
Com. Madrid	—	1	1	1	1	1
Navarra	—	1	1	—	—	—
La Rioja	—	—	1	—	—	—
Canarias	—	—	—	1	1	—
Extremadura	—	—	—	—	—	—
TOTAL SPAIN	1	25	81	44	30	28

Source: Fàbregas (1980), pp. 7, 11-12; Sudrià (1983), pp. 116-118; Fàbregas (2003), pp. 109-112; Fàbregas (2017a), p. 40; PFHA.SCAG. *A la Comisión de Presupuestos del Congreso* (16-05-1898).

needed. It was thought that within a few years natural gas could significantly multiply its presence in the gas market in competition with other energies, and that it could also bring a gaseous fuel of high quality through pipelines to many points in Spain, where for different reasons the traditional gasworks had never reached³⁷⁷ (Table 50).

Probably because of living standards, low urbanization and little industry, and also a milder climate and more hours of sunshine, the spread of gasworks in Spain was minimal in historical times compared to the density of thousands of gasworks in

377. Fàbregas (1969), pp. 84-98.

the UK and elsewhere. Of the gasworks in Spain as a whole, almost half were always located in Catalonia, followed mainly by Andalusia, Valencia and the Balearic Islands.

The need for coal supply and the difficulties of internal transport led to a map with few gasworks in the interior of the peninsula. Perhaps the presence or not of local entrepreneurs or the greater appetite of foreigners for the provincial capitals also had its influence. There are significant differences according to the areas of Spain in the nationality of the promoter of the gasworks and companies. In all the gasworks promoted in the first 20 years of industry (1842-1861), in the case of Catalonia 82% were local developers, while in the rest of Spain 71% were foreign.

Pere Duran, New Chairman of the Board

In the 1960s, the time for natural gas had come for Europe, but it seemed that Spain, as always, would be left out of the action. In fact, with the exception of Catalonia, the diffusion of manufactured gas in Spain had not historically been very great, and in recent years, oil, electricity and butane had grown strongly, while many gasworks had closed down. However, the opportunity came by way of Catalana de Gas y Electricidad, which had already begun studies in the late 1950s on the possibility of bringing Algerian gas to Spain via a pipeline to be built on the Mediterranean coast, and from Pere Duran, the true architect of the introduction of natural gas into the country.

In 1965, Juan Bertrand Mata, chairman of Catalana de Gas y Electricidad since 1945, died. He was the person who had brought the company closer to the Banco Urquijo, on whose Board of Directors he was a member; he had led the creation of Hidroeléctrica de Cataluña as a subsidiary, and finally, he had placed his trust in Pere Duran, first as CEO of Hidroeléctrica de Cataluña and later of Catalana de Gas.

In those years, Pere Duran had become the factotum of Catalonia's industry³⁷⁸, his maturity, his overflowing imagination, his orientation to action, his personal strength that allowed him to take risks, and last but not least, his capacity for leadership and the bringing together of different groups thanks to his work and his personal capacity for seduction, had made him present in multiple scenarios.

378. Fàbregas (2014b), pp. 60-84.

He was in the gas and electricity business, but he was also sought after in many other activities, and so, when a historic metallurgical company such as La Maquinista Terrestre y Marítima had problems, Duran was appointed chief executive, even though the company had nothing to do with gas and electricity, as it was basically engaged in producing tractor trucks for railways and diesel engines for ships.

If the subject of the day was to promote the Banco Industrial de Cataluña, Pere Duran was there. If the matter was to save a company of electrical equipment for the automobile industry and air conditioning equipment, such as Auto Electricidad, he was also there. And if the government considered how to implement the first motorways in Spain, Duran was appointed manager of the Comisión Promotora de Autopistas (Promotion Committee for Motorways), or if it was a question of modernizing Renfe, he would appear on its Board of Directors. Long gone were the days when Duran experimented with artificial rain and wrote articles on science and technology in the magazine of the Colegio de Ingenieros de Caminos (College of Civil Engineers).

Duran had demonstrated his ability to relate to politicians and bankers, as evidenced by his relations with López Bravo and Juan Lladó, and his eventual knowledge of General Franco. But he would also be the first businessman in Spain to engage in dialogue with the illegal Comisiones Obreras in 1967, at a clearly pre-democratic stage. In those years, both for his position in Catalana de Gas and Hidroeléctrica de Cataluña, his relationship with the Banco Urquijo and his deep friendship with the Minister of Industry, Gregorio López Bravo, and his important network of connections, Pere Duran was the great expert in solving the problems of industrial companies and infrastructures in the country.

At some point it was rumored that they wanted to make him a minister, and it was evident that he had built a dense network of international relations through ASSEMI, with people from different countries, such as Aurelio Peccei, the creator of the Club of Rome, or Algerian FLN leaders. Duran had already obtained his first recognitions, such as the awarding on October 1, 1964 of the Grand Cross of the Order of Civil Merit, or the Silver Medal of the Province of Barcelona granted by the Diputación Provincial.

The time had come for the big game, and the first move was that the shareholders of Catalana de Gas decided that Juan Bertrand's replacement, as chairman of the company, would be Pere Duran, who was appointed that same year of 1965.³⁷⁹

379. Fàbregas (2014c), pp. 46-47.

This represented a clear change for Duran, who became the last person to be responsible for the conglomerate led by Catalana de Gas, one of the most important in the country, and who evidently faced great challenges in the almost immediate future: natural gas and nuclear energy, issues in which he could develop all his capacity as an agile entrepreneur with the power of creation and, in short, of leadership, integration and results orientation. Pere Duran was one of the first cases, if not the first case, in Spain of a chairman of a large company who was not part of the ownership of its capital; on the contrary, he came from what John Kenneth Galbraith would designate as one of the vectors of development in modern times, the techno-structure.³⁸⁰

Within a short time, the changes were substantial: Catalana de Gas created Gas Natural, S.A. for the project of bringing this energy to Spain and the chairman was Pere Duran; through Hidroeléctrica de Cataluña, the company participated with other electricity companies in HIFRENSA to make the first nuclear power plant in Catalonia; the chairman was also Pere Duran. He was also appointed to the Board of Directors of the Banco Urquijo in 1966, and later to the Board of the Consejo del Hispano Americano. When the Banco Urquijo created the first investment fund in Spain in 1966, NUVOFONDO — within the scope of Law 2/1962 of April 14, on the basis of credit and banking regulation — it appointed Gesfondo, S.A. whose chairman was Duran Farell and Ramon Trías Fargas, the CEO.

The Banco Urquijo's main investments in gas and electricity at the time were: Catalana de Gas y Electricidad, Unión Eléctrica Madrileña, Hidroeléctrica de Cataluña and Gas Madrid. It was hard to imagine in the 1960s that the Banco Urquijo would disappear in the 1980s; that in the 1990s Catalana de Gas and Gas Madrid would merge and give rise to Gas Natural SDG, and that already in the 21st century, Gas Natural SDG and the continuation of Unión Eléctrica Madrileña, that is, Unión Fenosa, would also merge and Gas Natural Fenosa would emerge. History permanently leaves its tracks and opens up new paths.

Throughout his time as chairman of Catalana de Gas, Pere Duran always held the General Shareholders' Meetings in Barcelona and in Catalan, both in Franco's time and in democracy; he believed that it was the language of habitual use of the shareholders and did not want to use another language despite the more or less agreeable image this generated with the authorities in different eras. Catalana de Gas was, and Duran knew it perfectly well, a company deeply rooted in the country.

380. Galbraith published his ideas in *The New Industrial State*, published in the United States in 1967.

Duran also had another characteristic, which in the General Shareholders' Meetings displayed its full value: he developed all his speeches without ever reading a text, not even a few pages or some notes. It was an impressive skill, because if necessary he could recite quantities of numbers and figures without making a mistake, and if he made a mistake, he would notice and correct them as he went along. Duran's technique was to take advantage of his incredible photographic memory, whether he or someone else prepared a speech for him, he would transcribe it by hand, and when he presented it, he would speak it as if he had it before him.

Pere Duran would do and be everything in the gas sector, he would modernize the coal installations with naphtha installations, he would bring natural gas to Spain, he would start relations with the Maghreb countries, he would be a consensus chairman between Repsol and "la Caixa" in recent times, etc. It should be recalled that the Algerian section of the Maghreb-Europe gas pipeline was named the Pere Duran pipeline by the Algerian authorities in recognition of his many years of work and special friendship with the Algerian people.

The Libyan Opportunity: Gas Natural, S.A.

In the mid-1960s, the chances of bringing gas from Algeria to Spain by pipeline were then very low. The independence of the country in 1962, with the change in political priorities that this entailed and also the advance of cryogenic techniques, pushed the project further back in time. In these circumstances Esso (now Exxon) discovered natural gas in the Libyan desert and designed a project to take it to the Mediterranean coast with a gas pipeline, and to build a liquefaction plant in Marsa-el-Brega, and then export it to Europe via methane, with two receiving terminals in Fos, near Marseille, and in La Spezia, near Genoa, to supply gas to France and Italy. Libya in those years was ruled by King Idris; the Gaddafi coup would not take place until 1969.³⁸¹

The already agreed upon project had to be reconsidered because of General de Gaulle's opposition to France's dependence, even if small, on an American company for energy as part of his policy of *grandeur*. Duran found this out and quickly

381. Muhammad Idris al-Senussi was king of Libya from the post-World War II decolonization until the seizure of power by Colonel Muammar al-Qadhafi in 1969.

and skillfully got the project to include Barcelona, and therefore, the supply to Spain, as a replacement for France's position.

In Spain, from the very beginning, Catalana de Gas had been interested in the subject of natural gas, strangely enough the Sindicato Nacional de Agua, Gas y Electricidad, (National Union of Water, Gas and Electricity), under the auspices of Minister José Solís, and the Instituto Nacional de Industria (INI), under Juan Antonio Suanzes, with their well-known thesis that all heavy industry had to be done by the state, theses that had completely dominated the era of economic autarky. The government had also set up an inter-ministerial commission headed by the Ministry of Foreign Affairs, and even the army had taken an interest in the issue after the Suez conflict, which had created problems in the Spanish oil supply, which was worrying from the point of view of national defense.

But after the Stabilization Plan, the initial Development Plans, and the appointment of Gregorio López Bravo as Minister of Industry in 1962, the political orientation had begun to change towards a greater openness of the Spanish economy and greater intervention by private initiative on all fronts.³⁸² Suanzes' position in this context progressively soured, until he presented his resignation to Franco in October of 1963, which, unlike many other times, was immediately accepted. A change of policy line was initiated, and more specifically in the case of energy, with changes in the gas policy, the nuclear policy and the oil policy.

On November 24, 1964, Catalana de Gas y Electricidad applied to the government for the administrative concession for the reception, storage and regasification of liquefied natural gas and its distribution, use and sale, via the construction of a regasification plant in the port of Barcelona. It also requested that the concession be transferred to a company in which it held a majority, and that the necessary facilities be authorized to separate the associated propane and butane from Libyan gas to be sold to the Monopolio, or state monopoly.³⁸³

CAMPSA and Butano immediately opposed it because they thought — in their own interest — that natural gas was a product of the Monopolio de Petróleos, and as such could not be managed by a private company. They also believed that the Ministry of Industry did not have the power to resolve this issue, but that it should be approved by the government. One of those who tried to help in this line of

382. Suárez Candeira (1988), pp. 354-356.

383. Fàbregas (2014b), pp. 96-97; Ballestero (2017), pp. 31-32. For the full history of natural gas in Spain, see Alfonso Ballestero's book, the result of a thorough consultation of archives and numerous interviews with the main actors, although basically those living in Madrid.

opposition was the Undersecretary of Finance of the time, Luis Valero Bermejo, who would appear continuously during this period. However, after a year and a half of processing, the concession requested was granted to Catalana de Gas on May 10, 1966, by an order of the Ministry of Industry.³⁸⁴

As Ballestero points out: “Although it might seem that this would put an end to the public-private debate in the natural gas sector, the reality was quite different. The advocates of the nationalization of the activity kept the debate open for at least another decade”.³⁸⁵

While awaiting the administrative concession, an appropriate supply contract was negotiated with Esso for the acquisition of 1,300 million cubic meters/year of gas from Libya for a period of fifteen years. The gas would basically be made up of methane (natural gas), which would have associated some 300 million cubic meters per year of propane and butane, which would have to be separated on arrival at the terminal of the port of Barcelona. The agreement was signed in New York on November 9, 1965, the day of the historic power outage that left eight states on the east coast of the United States without electricity. Perhaps fate wished to warn of the fragility of human constructions in complex contexts, but the only thing that had happened — according to the explanations given later — was an overload not adequately absorbed by the protection relays of the Clay substation of Niagara Falls.

In order to develop the project, Catalana de Gas y Electricidad associated with Esso, the Banco Hispano Americano, Banco Urquijo and Banco Popular Español set up the company Gas Natural, S.A. in Barcelona in 1965, with the initial objective of importing natural gas from Libya, contracted with Esso, and subsequently from Algeria, and building a regasification plant in the port of Barcelona, and a commercialization network in the area. Pere Duran was appointed as the first chairman and Pere Grau Hoyos, both from Catalana de Gas, was appointed as managing director.

For the construction of the plant, several locations were studied until finally the inflammable wharf of the port of Barcelona was chosen, where it was necessary to create a landfill gained from the sea, an additional complication to the already existing complexity of erecting, for the first time in Spain, a plant that operated with cryogenic technology, with the consequent absorption of state-of-the-art technology. Likewise, the company Naviera de Productos Licuados, S.A. (NAPRO-LI) was established between Catalana de Gas y Electricidad and Marítima del

384. Fàbregas (2017c), pp. 12-13.

385. Ballestero (2017), p. 37.

Norte, for the construction of the first Spanish methane tanker, the *Laietà*, which was launched in 1968 and assigned to traffic with Libya.

The inauguration of the plant with the unloading of the first shipment took place in 1969; the history of natural gas began in Spain, in the same city of Barcelona, where the lighting gas had begun many years previously, 127 years before. The countdown also began for the disappearance of the city gasworks, which at that time ran on naphtha, gasworks that would no longer be renewed at the end of their useful life.

With the new arrival of energy, the gas sector could aspire, given the energy and environmental qualities of the product, to have access to a new and important market: industry, which would allow an extraordinary growth of the sector. There was a shift from a stage of growth limited by the capacity of the plants to a phase with virtually no limits, given that if more gas was needed, more methane tankers could be programmed. The quality of the product mean it was possible, for the first time in Spain, to have a fuel that in a production facility could touch the product without staining it like fuel oil, which opened up unusual possibilities in sectors such as the manufacture of ceramics, for example.

However, internal dynamics also had to change; the first step had to be the beginning of the transition from city gas to natural gas in the area of Barcelona, with a first phase during 1969-1972 and a second phase in the years 1985-1990. The operation involved complex logistics, as all the injectors of all the appliances used had to be adapted to the new gas with a higher calorific value. New technologies had to be learned, cryogenic of course, but also how to distribute dry gas, how to transport gas at high pressures, how to control an increasingly complex network. Combustion experts had to be trained who could help industries. A no less important issue was how to learn to work with the Americans of Esso, who in the early years brought their experience to the project and a very important, smoothly applied knowledge of modern management.

The project became more ambitious; the Libyan gas had a small part of ethane, propane and butane associated with it, which had to be separated in the plant, and for which a possible gas-chemical and industrial development was studied, together with suitable technological partners in each case. In this way, companies and projects were designed, among others, to produce ethylene from the ethane of Libya's gas, which was not among the products of the Monopolio; also Aquitaine Ibérica, S.A. to produce polypropylene from ethylene, together with the French SNPA (Société Nationale des Pétroles d'Aquitaine); Frigas, S.A. to take advantage

of the cold temperatures of LNG; and Petrofibra, S.A. to produce acrylic fibers from polypropylene. Terquimsa (Terminales Químicos, S.A.) was also set up to store chemical products in the port of Barcelona, which was practically the only one that was actually put into operation and which acted continuously in the markets. A new team from Derivados del Azufre, S.A., directed by José Arbós Batista, with people such as Gregorio Rivera, Joan Romagosa, Julio Torras and Carlos Pi, joined the initiative for this purpose.

At the time of fixing the taxation of natural gas, the Undersecretary of Finance, Luis Valero, reappeared, who believed that natural gas should pay a fee to the Renta de Petróleos and not have any advantage. However, Valero was dismissed by Finance Minister Juan José Espinosa San Martín in December of 1967. In January 1968 it was established that natural gas would pay 4.7% CIF Spanish port to the Renta de Petróleos.³⁸⁶

The Barcelona regasification plant began its industrial activity on February 19, 1969, when it unloaded the first methane tanker, thus beginning the era of natural gas in Spain.³⁸⁷ In a very short time, gas had switched from coal gas to naphtha gas, and natural gas had arrived, specifically in eight years from the arrival of Pere Duran on the Board of Catalana de Gas to the arrival of the first methane tanker in Spain. But in a few months, in September of 1969, Colonel Muammar al-Gaddafi's coup d'état would take place, thus ushering in a time of political uncertainty.

On the other hand, the long and dense discussions with different government bodies, with the Monopolio de Petróleos, with CAMPSA, with Butano, on whether natural gas was a product of the Monopolio, or what taxation had to be assigned to it, etc., seemed to have ended with the start-up of the plant, especially when in June of 1970, General Franco himself conducted the official opening of the facilities of Gas Natural, S.A. in the port of Barcelona, next to Pere Duran. However, as we will see and as always happens, the story was not over, the story continued...

In spite of all the problems and difficulties, thanks to the efforts of Catalana de Gas y Electricidad and its president Pere Duran, from 1969 onwards and from Barcelona the Spanish energy market began to have available one of the energies of the

386. Fàbregas (2017c), p. 13.

387. In Spain there was a certain idea that the natural gas industry in Europe was basically in the hands of the public initiative, and the case of Spain with Gas Natural, S.A. was strange, as it appeared in the private sphere. Indeed, the introduction of natural gas in Europe was led by private companies such as Shell and Exxon, through their Gasunie and Rhurgas subsidiaries, which operated in the main markets. France and the United Kingdom, with the gas and electricity sectors nationalized after the Second World War, a policy that Spain had renounced at the time, were also cases in point.

future; the great leap forward had been made, Spain was no longer so strange or so different from Europe. The possibilities for expansion and growth were significant from the moment it was no longer necessary for each municipality to have a gasworks, but rather could be supplied with an extension of the gas pipeline; the possibilities for service were thus brought closer and the maturation times of the investments were reduced. In addition, an energy cleaner than previously existing ones was introduced in the Barcelona area, with the consequent improvement of the environment. Once again, Catalana de Gas had led the technological change and introduced new possibilities to the historic gas sector, contributing to transforming society.

Natural Gas and Those Nostalgic for the Regime

The change of the Minister of Industry and President of INI in 1969, and the appointment of José María López de Letona and Claudio Boada, respectively, to replace them, would alter the established political line; the aim was to give more prominence to the public administration in the energy sector, which meant that while in the 1960s several refineries in Spain had been awarded to the private sector, the last one, that of Catalonia, would belong to INI. In the field of gas, the new policy revived the position of those who believed that natural gas was a product of the Monopolio de Petr6leos and that it should be administered by the state.

The champions of this position would be Luis Valero Bermejo and José García Hernández. We have already seen Valero act; at that time he was the chairman of the Refinería de Petr6leos de Escombreras, S.A. (REPESA), after having held different positions in the public administration of General Franco. He had also been civil governor and provincial head of the Movimiento de Navarra, procurator in the Cortes by direct appointment of the head of state, and representative of the Falangist group in the crisis of the newspaper, *Madrid*, and had been decorated with the Grand Cross of the Imperial Order of the Yolk and Arrows in 1968. Later on, he would again appear as president of the Empresa Nacional del Gas y de Butano, and also in the transition as a close collaborator of José Antonio Gir6n de Velasco.³⁸⁸

José García Hernández was at that time president of Butano, S.A. but he came from a long career in the Franco administration; he was a government lawyer, and had been civil governor and provincial head of the Movimiento, in this case in Lugo

388. Whom he accompanied as secretary of the Confederación Nacional de Combatientes.

and Las Palmas, and president of the Diputación de Guadalajara, procurator in the Cortes and managing director of the local administration. Collaborator of Camilo Alonso Vega and Arias Navarro, he was appointed first vice president of the government in the cabinet of Carlos Arias in 1974-1975.

In the early 1970s, Pere Duran was about to complete a very long negotiation with Algeria to obtain a supply of Algerian gas for Spain. Negotiations with all sorts of stakeholders had been going on practically since the country's independence in 1962. And while in 1966 it seemed that an agreement had been reached, in 1968 the negotiations broke down. The revolution in Libya in 1969, with the Barcelona plant already in commercial operation, had added interest to Algeria's possibilities as an alternative supplier. And so, Pere Duran reopened negotiations with the country in February of 1971, not by then as Catalana de Gas, but as Gas Natural, S.A. The negotiations culminated in the signing of an agreement in principle on February 10, 1972 in Algiers between Pere Duran and Sid Ahmed Gozali, Chairman and CEO of Sonatrach.

The agreement was for the acquisition of 232 billion thermies³⁸⁹, beginning in 1974 and ending in 1991, with an initial price of 46 cents per million BTUs (British Thermal Unit) and an estimated price in 1991 of 58.76 cents. The scaling up of quantities, the build up, in millions of thermies, began in 1974 with 3 billion thermies and reached its peak beginning in 1979 with 15 billion thermies/year until 1991, including the take or pay clause, i.e. the gas contracted had to be taken, and if it could not be for whatever reason, for example due to lack of market development, it would have to be paid for as well. The final contract was signed on April 14, 1972 and included a *rattrapage* clause, which softened the take-or-pay clause by allowing, in the event of delays in withdrawals, their recovery within a certain period of time. The contract benefited from a truly unbeatable price of 46 US cents per million BTUs because it was allocated the surplus from a liquefaction train to be built for an export contract to the United States. Taking advantage of the small size of the Spanish market, it had been possible to buy at a marginal price. The contract with the Spanish company was the third signed by Algeria, after those of El Paso and Gaz de France.

But while Duran reached agreements with Algeria, in Madrid the new political line in the Ministry of Industry advanced. José García Hernández indicated that the

389. Thermie is a unit of energy that has been used for many years in the gas industry; it is equivalent to 1,000 kcal, 1,163 kWh, or 3967 BTU.

gas policy should be developed: “on the basis of the nationalization of natural gas and, fundamentally, of the fact that it would be a state company that would carry out the energy policy determined by the government in the gas sector”³⁹⁰, with the intention of including natural gas in the Monopolio de Petr leos and entrusting its management to Butano, which would be subrogated in what had previously been done, and would be the new gas importer in Spain, although respecting the activity in the city of Barcelona of Gas Natural, S.A. but without any possibilities for growth. In short, state intervention in the sector.

Along the same lines, Butano, which was owned 50% by REPESA and 50% by CAMPSA³⁹¹, even prepared a preliminary project to build a gas pipeline from Algeria, and began to take steps in that country, whose authorities, who had always spoken to Duran, did not understand very well what was happening. Without a European project and with an undeveloped Spanish market, the alternative of a gas pipeline only for Spain was really unthinkable from an economic-financial perspective. Pere Duran and Luis Valero, chairman of REPESA, met on January 10, 1972, but the prospects were far from certain. One had a mythical and mystical vision of the state, while the other was a pragmatic entrepreneur obsessed with doing things, doing them well and building elements of the future in an effective way. The dialogue was, to say the least, difficult.

The moment of the greatest confrontation began as a result of a letter that Jos  Garc a Hern ndez, chairman of Butano, sent on February 9, 1972 to the Minister of Finance, Alberto Monreal, explaining a meeting with the Minister of Industry, L pez de Latona, on the relations of Gas Natural, S.A. and Butano, S.A. In the letter Garc a Hern ndez sowed doubts about the conduct of the Minister of Foreign Affairs, Gregorio L pez Bravo; he indicated that “... he had no misgivings as to the pulchritude of the conduct of the current team of the Ministry of Industry, although my reservations and thoughts were very different in relation to another stage”.³⁹² The current stage of Ministry of Industry was that of L pez de Latona; the other stage, that of Gregorio L pez Bravo. He also took advantage in his argument the coincidence of Duran’s stay in Algiers to sign the contract, and L pez Bravo’s official visit.

The reaction of the government was fulminating; the Comisi n Delegada del Gobierno para Asuntos Econ micos (Delegate Commission of the Government for

390. PFHA.VALERO. *Informe de Butano, S.A. (24-02-1972) y Borrador Decreto Ley por el que se regula el r gimen de los gases combustibles de base hidrocarburada dentro del  mbito del Monopolio de Petr leos (29-02-1972)*.

391. CAMPSA at that time was majority privately owned, with the shares in the hands of Spanish banks.

392. PFHA.VALERO. *Carta de Jos  Garc a Hern ndez a Alberto Monreal Luque (09-02-1972)*; Ballesteros (2017), pp. 51-52.

Economic Affairs), presided over by General Franco and held on February 11, 1972, only two days after the aforementioned letter, decided to dismiss José García Hernández as president of Butano, as well as Luis Valero as president of REPESA, which was the other person obsessed with the idea that natural gas should be nationalized in Spain, to correct the mistakes of López Bravo in his time as minister of Industry. In his explanations of the letter, García Hernández commented that his reservations about López Bravo came from when he granted the concession in 1966 to Gas Natural, S.A. to develop its project, which, in his opinion, in no case should have been done because natural gas was a product of the Monopolio de Petr6leos.

Despite the agreement of the Comisión Delegada, and subsequent pressure from López de Letona, and even Luis Carrero Blanco, neither García Hernández nor Valero resigned from their posts; the former had to be separated by the Board of Directors of Butano on February 29, and the latter by the General Shareholders' Meeting of REPESA held on May 5. Pere Duran's enemies were highly complex characters. The forced resignations of García Hernández and Valero Bermejo alone would not solve the problem, except perhaps their most extreme stridencies, albeit with a human cost that would later reappear.

The Creation of Enagás

On March 6, 1972, an unfortunate accident occurred on Calle del Captain Arenas 57-59, in Barcelona, in which an explosion caused the collapse of a nine-storey building, resulting in the death of 18 people. The explosion was immediately attributed to natural gas, which produced a logical reaction in the press, but which was greatly amplified, as Francesc Cabana points out, in the press of the Movimiento — *La Prensa*, *Solidaridad Nacional*, *Hoja del Lunes* — creating an authentic campaign against Catalana de Gas y Electricidad and Pere Duran. Subsequently, both the Colegio Oficial de Ingenieros Industriales de Catalunya (Official Association of Industrial Engineers of Catalonia) and British Gas issued opinions that concluded that the explosion could not have been caused by natural gas.

But the moment of temporary weakness of the natural gas introducers in Spain was taken advantage of effectively; only a few days later, on March 23, the government surprisingly approved a decree by which the INI was charged with setting up the Empresa Nacional del Gas, S.A. (Enagás), with the purpose of being the state's instrument in the natural gas sector.

The company was incorporated on July 13, 1972 with a capital of 100 million pesetas and a single shareholder, INI. It was an intermediate solution, an instrument of the state was created, but without including natural gas in the Monopolio de Petr leos or assigning any role to the Butano company. The purpose of Enag s, according to the decree, was to be the state's instrument for the acquisition of natural gas within the country or on foreign markets, as well as for the import, construction and operation of pipelines, when the state decided to undertake these operations itself. And also, to build secondary networks and distribution and direct sales to consumers, but only in case of default of private initiative. For Catalana de Gas it was a threat, but for Valero-Garc a Hern ndez it was too short a move. The story continued.

It should be noted that if it was thought that Enag s had to undertake important things with the capital of 100 million pesetas allocated to it, it could hardly seriously set itself ambitious objectives.³⁹³ In fact, the financial situation of Enag s during many of its first years of existence was one of its serious problems; the high-flown language of the state of wanting to undertake great things, did not later materialize in the adequate financing of its instrument to do so. Many years of Enag s' book losses were caused not by its commercial activities, but by the very bad financing granted to it by its sole shareholder, the state. Language was one dimension, but reality was another, more forceful dimension.

The new company Enag s was authorized by the Consejo de Ministros on July 26, 1973 to negotiate with Sonatrach a contract for the supply of natural gas from Algeria of 4,500 million cubic meters per year for 20 years, and to invest up to 12,000 million pesetas over a period of 4-5 years to install a gas pipeline network linking Catalonia, Valencia, the Basque Country and Madrid, a budget which included the construction of two regasification terminals in Valencia and the Basque Country. Enag s also participated in December of 1973 in the constitution of the company SEGAMO (Soci t  d' tudes de Gazoduc de la M diterran e Occidentale), with Gaz de France and Sonatrach, to study the possibility of crossing the Mediterranean with a gas pipeline.³⁹⁴

393. On a comparative level, the share capital of Catalana de Gas y Electricidad in 1972 amounted to 2,441 million pesetas, almost 25 times more.

394. The management team of that first Enag s was basically made up of what someone called the beautiful people: chairman, Rafael del Pino, owner of Ferrovial; chief executive officer, Mariano Rubio, later governor of the Bank of Spain, and financial director, Carlos Bustelo, later minister of industry. All of them framed with the Minister of Industry, L pez de Latona, and the chairman of INI, Claudio Boada. F bregas (2017c), pp. 15-16.

A few months after the launch of Enagás, on October 16, 1973, the oil-producing countries of the Persian Gulf meeting in Kuwait decided to set the price of crude oil at \$3.7 per barrel, a decision that would change the world. Until then, oil prices had remained at around \$1/barrel, or slightly lower. At the present time, when we are used to prices of between \$50 and \$100/barrel, it is probably difficult to explain the changed circumstances in the world, the shocks, restrictions, embargoes, power cuts, etc. One year later prices were already at the \$11/barrel level.

The first energy crisis had appeared. Energy, as was already evident, was vital to the functioning of modern society. The consequences of the crisis affected practically all countries to a greater or lesser degree, and led to a progressive weakening of the international monetary system. In Spain, the serious effects of the so-called energy crisis came to an end with the end of General Franco's regime and its effects were either tamed, or hidden, as one may prefer, during the first years of the transition, until they appeared in all their crudeness, forcing harsher actions to recover a path of growth and stability in the Spanish economy.

The Assassination of Carrero Blanco

On December 20, 1973, an event occurred that had a powerful impact on the course of events in Spain: the assassination of Admiral Luis Carrero Blanco, victim of an ETA attack on a street in Madrid. And this event changed history. Carrero had been appointed president of the government on June 11 of the same year, in a move reflecting a certain degree of evolution in the regime of General Franco, with the separation of the presidency of the government from the head of the state. Carrero had been chosen by Franco from the list of candidates presented by the Consejo del Reino (Kingdom Council): Luis Carrero Blanco, Raimundo Fernández Cuesta and Manuel Fraga Iribarne. Carrero's disappearance put the regime on the defensive, and so the next three candidates presented by the Consejo del Reino were very close and loyal people: Carlos Arias Navarro, José Solís Ruiz and José García Hernández.

Carlos Arias, Minister of the Interior with Carrero, was chosen. José Solís had always been the secretary general of the Movimiento until the MATESA affair, when he was dismissed by Franco. As for José García Hernández, he was the same García Hernández we have seen acting as president of Butano, and who, after a

few paragraphs of a letter to the Finance Minister of the time, had been dismissed outright. Bad times.

The thing is, however, when Carlos Arias formed a government on January 3, 1974³⁹⁵, he placed García Hernández as first vice-president and Minister of the Interior. Carrero's disappearance resulted in a hardening of the government's positions on natural gas. García Hernández advanced his positions; Luis Valero would do so later, but with his usual ideas, that gas had to be included within the Monopolio de Petróleos, and Butano should take care of everything. Catalana de Gas and Gas Natural, S.A., meanwhile, had to shoulder the complex consequences and begin to build new realities.

A sample of the style and thinking can be seen in the letter that Luis Valero sent to Carlos Arias on January 5, 1974³⁹⁶, just two days after his inauguration, with the excuse of a visit to Madrid by a delegation of the OPEC (Organization of Arab Petroleum Exporting Countries). Valero's reflections were still based on his obsessive points, that is, that all the problems stemmed from Gregorio López Bravo, Duran and the private companies; the letter explained that: "After Gregorio López Bravo's arrival at the Ministry of Industry, the liberalization of the sector produces the following effects: Campsa must be reduced only to marketing; refineries can be mixed capital [...]; private capital and, of course, banking capital must come to the sector; industrial energy prices must be protected (hence the phenomenal increase in fuel consumption by power plants, cement, heating, industry in general); the importance of the fiscal monopoly must be assessed but not excessively, the Ministry of Industry is the key to energy policy".

And he continued: "Gregorio López Bravo freezes it [he refers to Butano]; since 1966 he has been trying to launch another gas, natural gas, and he is encouraging Pedro Duran to be the instrument of a new gas policy; with a gas which, being of petroleum origin, is subject to monopoly. But all the barriers have been overcome and the men who defend the unity of the monopoly, the use of the Butano, S.A. company to the very end of its possibilities, which is perfectly capable of introducing natural gas into Spain, and the state guarantee on gas purchases abroad, etc. [...], were dismissed from their posts". And so on for seven pages, this letter to Carlos Arias, two days after forming the government, must have had its effect, as will be seen from the actions carried out in the following months.

395. Fábregas (2017c), pp. 16-17.

396. PFHA.VALERO. *Carta de Luis Valero Bermejo a Carlos Arias Navarro* (05-01-1974).

The *Nationalization* of the Natural Gas Sector Head Office

The recomposition of the government following Carrero's assassination, with Arias as president and García Hernández as first vice-president, also led to the change of López de Letona for Alfredo Santos Blanco at the Ministry of Industry, which in turn led to the replacement of Claudio Boada as president of INI by Francisco Fernández Ordóñez, as of February 1, 1974. Later García Hernández put a lot of pressure on Fernández Ordoñez until he got him to place Luis Valero in Enagás and Butano; Rafael del Pino resigned, and Mariano Rubio and Carlos Bustelo left with him. Between June and July of that same year, Valero was formally appointed president of Enagás and also of Butano. He would later write: "I did not ask for the appointment, but I accepted it, always under the condition that the merger be carried out (the merger of Enagás and Butano), nationalizing the sector and trying to establish a satisfactory status quo with the Catalan group which, with the protection and encouragement of López Bravo, had occupied de facto monopolistic positions in the most important market in Spain, and prepared to expand to other important areas (Madrid, Zaragoza, Valencia, Seville, etc.) with the support of American Esso, and to weaken the state monopoly of liquid hydrocarbons".³⁹⁷

Pere Duran, seeing how things were evolving, and trying to save the core company, Catalana de Gas, two days before Valero's appointments, had already established a principle of agreement with him; it was based on a best effort regarding a possible entry of Enagás into Gas Natural, S.A. with 25% and CEGAS, with 50%, in exchange for Valero supporting the expansion of this conglomerate throughout Spain. In short, 'you participate in my activity as a minority, but I can expand with you without problems in Spain'. This agreement of principle was never put into practice. At that time, July of 1974, the press was already speculating on the future, rumors of mergers were heard, the merger of Enagás with Butano seemed clear, but Feliciano Baratech also wrote in *La Vanguardia* about a possible merger of Catalana de Gas, Gas Natural and CEGAS, to later give Enagás-Butano a minority stake.

In the end, the gas sector policy was taken up at the Consejo de Ministros held in A Coruña on August 30. Coincidentally, the Council was presided over by the Prince of Spain due to General Franco's illnesses; at the session, the document entitled

397. PFHA.VALERO. *Carta de Luis Valero Bermejo a Adolfo Suárez* (13-09-1976). Luis Valero, upon being appointed president of Enagás, appointed Antonio Martínez Cattaneo as CEO. Ballester (2017), p. 66.

Ordenación del sector de combustibles gaseosas (Regulation of the gaseous fuels sector) was approved, and it was agreed that Enagás and Butano would merge, and that Enagás would be the only gas buyer for Spain, according to Luis Atienza.

Everything was changing, and everything was also speeding up. On November 17, the Confederación Nacional de Excombatientes (National Confederation of Former Combatants) was created, appointing José Antonio Girón de Velasco, Franco's former Falangist minister, as president and Luis Valero Bermejo as secretary. From the words of Girón when he took office, we quote: "The commitment of this hour is to avoid saying 'Nothing has happened here'. A lot has happened here and a lot more is going to happen".³⁹⁸ A message that clearly did little to calm matters. Progressively, with increasing intensity, Luis Valero's political roots as a member of the Falange and Franco's regime appeared in the preludes to regime change.

Another example of the growing interest of the state in the energy sector could be seen when, on November 28, 1974, the concentration of the state's interests in the sector was announced with the creation of ENPETROL (Empresa Nacional de Petróleo, S.A.), through the merger of REPESA, ENCASO and ENTASA, that is, the refineries of Escombreras, Puertollano and Tarragona. INI's stake would amount to 71.7%, with Chevron and Texaco as minority partners.

At the end of November, Luis Valero presented himself to the press as the new president of Enagás y Butano; he was truly enthusiastic. He explained that he was negotiating supplies with Algeria and also with Venezuela, Nigeria and Iran; that the merger of Enagás with Butano would take place in the first months of 1975; that the Barcelona - Valencia - Bilbao gas pipeline would be completed by 1979; that Bilbao would have a regasification plant by 1977, that Madrid would be reached a little later, and that plants would also be installed in Algeciras and Palma de Mallorca. In time it would become clear that virtually none of these projects were carried out at that time. He also explained that: "The Catalan companies (Catalana de Gas and Gas Natural S.A.) have rendered a good service to the country and will continue to do so. The participation that Enagás will surely take in them will, in any case, be a minority participation".³⁹⁹ The world was already a different place.

Finally, in December of 1974, and in view of the situation, Pere Duran had no choice but to adapt to reality and make a deal; he rejected the state's entry into his companies and preferred to agree to the sale of the assets to the state through

398. *El Alcázar*, November 17, 1974.

399. *La Vanguardia*, November 29, 1974.

Luis Valero's Enagás. Duran explained this later as follows: "During a long meeting in Barcelona, the new president of Enagás and I communicated, with clear force and with exquisite cordiality and personal respect, our respective criteria and absolutely opposing points of view. But in the context of an inflexible political situation, without palliatives of any kind, in which industrial reason and the moral strength of a whole history were relentlessly opposed by the reasoning of the state, I had to accept, in the final analysis and out of pure pragmatism and instinct for conservation or survival, the transfer to Enagás of the Barcelona plant and of the contracts of Libya and Algeria. Gas Natural S.A. therefore ceded the plant and contracts to Enagás and the industrial distribution network to Catalana de Gas".⁴⁰⁰

A detailed negotiation was opened for twelve months.⁴⁰¹ It was agreed that Gas Natural, S.A. would transfer to Enagás the supply contracts for Libya and Algeria, and the regasification plant in Barcelona, for 2,900 million pesetas, 1,504 million pesetas to be paid in cash and the rest in 2 years in two installments of 700 million pesetas each; and that it would transfer to Catalana de Gas y Electricidad, the industrial customers and the transmission and distribution network that fed them, for 2,400 million pesetas to be paid over 15 years. In addition, Catalana de Gas would buy the natural gas it needed from Enagás, via a supply contract to be defined. The agreements were signed on December 1, 1975 at the Catalana de Gas y Electricidad headquarters in Barcelona.⁴⁰² As fate would have it, Enagás had been granted the administrative concession for the construction of the Red Nacional de Gasoductos (National Gas Pipeline Network) 17 days earlier, and General Franco had died ten days before. It was the beginning of another stage of history.

Since its creation in 1972, Enagás had not supplied one cubic meter of gas, until it acquired the assets and contracts of Gas Natural, S.A. at the end of 1975. However, the next day its sole customer was Catalana de Gas, which bought the gas from it and supplied it to its industrial customers, and Térmicas del Besós, a subsidiary of Hidroeléctrica de Cataluña, for its plant in Sant Adrià. Throughout 1975, Enagás had received government authorization to build 880 kilometers of gas pipeline,

400. Fàbregas (2001), p. 76.

401. In this negotiation I met for the first time Antonio Téllez de Peralta, then Enagás' Planning Director, and later CEO of Gas Natural SDG.

402. Enagás constructed the explanation that the operation was necessary because of the precarious situation of Gas Natural S.A., which would serve to try to avoid the image of the evident movement towards the centralization and nationalization of the natural gas sector of the designed operations. Ballester (2017), p. 80.

but it continued with its tiny capital of 100 million pesetas, in short, grandiloquent speeches, very hard positions, but then impossible endeavors through inadequate financing.

The situation after this important change of roles left Enagás as the leader of the sector, while Catalana de Gas y Electricidad, in addition to its traditional domestic and commercial market, added the industrial market, with a more downstream orientation. But there was also a Gas Natural, S.A., which had money on hand and had to be reoriented in a new direction, and which would end up becoming Corporación Industrial Catalana. Luis Valero managed to expropriate the assets of Pere Duran and become the head of the gas industry, but he was unable to succeed in bringing to a conclusion his great obsession, the merger of Enagás and Butano, despite the approval of the Consejo de Ministros.

The Regulation of the Ter, the Vandellòs Nuclear Power Plant and the Tarragona Refinery

The 1960s and 1970s, despite being years of significant changes in the gas sector and which would orient its future, with innovations and political struggles of all kinds, are also years in which Catalana de Gas y Electricidad was present from different perspectives in the development of other energy sectors in Catalonia. It took part in the preliminaries for the tender for the refinery of Catalonia, continued with the investments in hydroelectric and thermal electricity, and collaborated in the construction of the project for the first nuclear power plant in Catalonia.

The Regulation of the Ter River and Térmicas del Besós, S.A. (1962-1967)

The group's electricity company, Hidroeléctrica de Cataluña (HECSA), after building the power plants on the Noguera Pallaresa river in the 1950s, focused on the use of the concessions in the Ter basin. These were from Saltos del Ter, S.A. and included the three power plants of El Pastoral (1962), Sau (1963) and Susqueda (1967), which contributed 180,000 hp to the company, achieving the regulation of the Ter River in an area close to Girona.

The modernization of the facilities also progressed with the start of the replacement of direct current with alternating current in the distribution network in Barcelona, a process that began in 1963, which meant that the part dedicated to conversion at the Vilanova plant, whose chimney had already been demolished

two years earlier, was no longer in service. The dynamics of the events and the important activity developed by HECSA led to a change in the relative weight of the Compañía de Fluido Eléctrico, so that finally, in 1965, the latter was absorbed by the former, and HECSA subrogated the Compañía de Fluido Eléctrico in the historic lease contract for the electric assets of Catalana de Gas y Electricidad.

By the 1960s, the parameters of the energy world had changed, until then gas had been produced from coal but was now made from naphtha, a light petroleum distillate. In the case of electricity, thermal electricity, also historically produced from coal, was on the same path of switching to oil, in this case a heavy distillate, fuel oil, and also to natural gas, much less polluting.

In this context, the Sant Adrià power plant, built in 1917 and powered by coal, was demolished in 1966, after almost 50 years of service, and the construction of a new thermal power station began in the same location, shared 50/50 between Hidroeléctrica de Cataluña and ENHER, which was named Besòs I, and which was inaugurated in December of 1967, with a capacity of 150MW. This line of collaboration continued in 1968, with the constitution 50/50 of the company Térmicas del Besós, S.A. (TERBESA), by HECSA and ENHER, with a share capital of 850 million pesetas, to manage Besòs I, and to develop new projects, such as the construction of a second group in the plant, called Besòs II, inaugurated in 1972, and subsequently another plant in Cubelles.

These plants were designed to burn fuel oil or natural gas, the fuel for which, during these same years, the regasification plant was being built in the free zone of the port of Barcelona. They were the first power plants in Spain to produce electricity from natural gas; they began functioning in 1969. However, due to the delay in the development of gas infrastructure in Spain, they were also the only gas-fired plants until 1979.

The progressive dimensioning of HECSA and the growth possibilities of Catalana de Gas y Electricidad in the gas sector, with the introduction of natural gas, led to a progressive disinvestment of the participation in HECSA held by Catalana de Gas. Along the same lines of electricity unbundling, Catalana's leased electricity assets were sold, and in 1976 HECSA acquired all the electricity assets of both La Catalana and its subsidiaries Eléctrica del Cinca and La Energía, with the sole exception of the El Run falls and hydroelectric plant in Seira. Among the assets were obviously the Vilanova power plant, the building on Calle dels Arcs, 10, and the Sant Adrià thermal power plant.

With all these restructurings, the building of the Vilanova power plant had ceased to have the industrial use for which it had been built, and HECSA decided to carry out a careful process of restoration of the Pere Falqués building to recon-vert its use to commercial offices for the company. The project was entrusted to the engineer Antoni Torra, who carried out an important work, maintaining the bridge crane and the control panels, as well as the decorative wrought iron elements in a building located in the heart of Barcelona.

At the corporate level, Pere Duran had replaced Ricardo Margarit as chairman of HECSA in 1968, and practically became the only link between Catalana de Gas and HECSA after the sale of the electricity assets in 1976, together with a group of shared members of the respective Boards of Directors. It was a very gas-oriented period in Catalana de Gas, very distant from electricity.

Vandellòs, the First Nuclear Power Plant in Catalonia (1966-1972)

Nuclear energy in Spain was initially oriented towards the autonomous development of an experimental reactor along the lines of the economic autarky, until the Nuclear Energy Law was approved in 1964 by Gregorio López Bravo at the Ministry of Industry, basically to promote the development of peaceful applications of nuclear energy and regulate the basic elements of safety and security. The Junta de Energía Nuclear (Nuclear Energy Board) (JEN) was also modernized and given new functions as the body to oversee the sector. Pere Duran was appointed a member of the JEN at that time.

The first nuclear energy projects in Spain chose enriched uranium technologies. This is the case of the Unión Eléctrica Madrileña (UEM) power plant in Zorita (Guadalajara), on the Tagus River, known as the José Cabrera power plant, with Westinghouse pressurized water technology. A 160 MW power plant was designed and built between 1965 and 1968 and was in operation until 2006. It was the first commercial nuclear power plant to operate in Spain.

The second was the Santa María de Garoña power plant (Burgos), on the Ebro River, promoted by Nuclenor (Iberduero and Electra de Viesgo), which chose General Electric's boiling water technology. The plant was built with 466 MW of power in the years 1966-1971, and remained in operation until December of 2012. It was the second commercial nuclear power plant to operate in Spain.

But there was a lack of natural uranium technology, in which Spain's hopes were placed because the country, on one hand, had uranium mines and, on the

other, did not have many foreign currency reserves to pay for enrichment processes, nor did it wish to create a political dependency at that time.

Charles de Gaulle, with his obsession not to depend on the United States, had managed to develop natural uranium technology in France, and to spread his technology he needed some third country to decide to use it. In this context, France proposed to Spain the joint construction of a nuclear power plant based on this technology in Catalonia, both because of its proximity to the French border and because of its high energy consumption; thus, in October of 1964, a joint working group was set up to study the project's feasibility, chaired by Pere Duran, as representative of HECSA.

The work of the group lasted approximately one year; through specialized commissions they studied the sites, the costs, the absorption of the energy produced, the use of Spanish uranium, etc., for the final development of the plant's viability plan. In terms of location, it was decided to place the new plant in Vandellòs, in an area between l'Hospitalet de l'Infant and l'Ametlla de Mar, which offered the best conditions, due to its geological structure, the ease of using sea water for cooling, and its distance from inhabited areas.

The issue of investment and costs was also important. French technology was more expensive than American investment technology, although cheaper to operate as it did not have to go through the uranium enrichment process, which was expensive and also created dependence, usually on the United States. However, the exceptional financing conditions offered by the French managed to match the costs per kilowatt produced.

For the construction of the plant, the company HIFRENSA (Hispano Francesa de Energía Nuclear, S.A.) was incorporated on November 16, 1966, with a capital of 1,000 million pesetas. The shareholders were: Électricité de France (EDF) (25%), FECSA (25%), HECSA (25%) and ENHER (25%), and Pere Duran was appointed chairman. Work began in 1966 and was completed in 1972. The plant was connected to the system on May 6, 1972 under the name Vandellòs I. It was the first nuclear power plant in Catalonia and at that time the largest of the three existing in Spain due to its installed capacity.

But the size of electrical issues was still very large, and if in May 1972 Vandellòs I was connected to the grid with 480 MW, in August the second TERBESA group of 300 MW in Barcelona would be connected to the grid; authorization had been obtained for an additional 500 MW, which had been installed in Cubelles, and in addition, a 15% participation was made in the construction of the Ascó 2 nuclear

power plant (Tarragona) of around 1,000 MW. The race for electrical power had begun; its consequences would be seen later.

The Tarragona Refinery Competition (1969)

At the beginning of the 1960s in Spain there were two oil refineries, one public belonging to REPESA in Cartagena and another private one outside the state monopoly, the one belonging to the Compañía Española de Petróleos in Tenerife. Spanish development and the progressive penetration of oil led to the award of new refineries in A Coruña, Puertollano, Algeciras, Castellón de la Plana, Huelva and Bilbao, the majority of private interests, except in Puertollano. Against all logic, there was no refinery in Catalonia, despite being the place by far where the main demand for oil products existed in Spain. In 1968 and 1969, the research department of the Banco Urquijo carried out an in-depth study on the subject in which it demonstrated the need for facilities in Catalonia, a study in which Pere Duran and Catalana de Gas took part. As a result of these movements, on July 22, 1969 the government decided that a new refinery would be allowed and that it would be located in Tarragona.

Catalana de Gas had initiated relations with Shell due to the joint participation in Industrias Químicas Asociadas, S.A. (IQA), in Tarragona, which produced ethylene from naphtha, at a time when La Catalana was exploring the possibility of developing gas with ethane from natural gas in Libya. The approach led to the announcement in March of 1970 by Shell and Catalana de Gas, when the issue of a possible refinery in Catalonia was raised, that they would bid together and lead the corresponding consortium. Catalana de Gas at the time was already an Esso partner in Gas Natural, S.A. and an alliance with Shell in oil established a truly important position. Shell and Esso were the largest oil and gas companies in the world at that time.

However, the illusion lasted only a short time, because when the tender was announced the government, with López de Latona in Industria, decided to change the rules of the game and establish that the refinery in Catalonia would be state controlled in accordance with the *national interest*.⁴⁰³ Why the refinery in Bilbao could be private but the one in Tarragona had to be state-controlled, is truly difficult to understand or explain. The new rules put an end to both Catalana de Gas and Shell's interest in being involved in the project.

403. Fàbregas (2014b), pp. 115-120.

1975-1990

The Political Transition
to Democracy

Fr

ranco's death and the advent of democracy through the process of political transition led to important changes to transform Spain into a democratic country after so many years of dictatorship. The transition resulted in very different situations for figures such as Luis Valero, who disappeared, or Pere Duran, whom everyone saw as the ideal candidate for public office.

The economic crisis, contained since the first energy crisis, would appear and great efforts and great sacrifices would be needed to move forward to construct new horizons, with greater competitiveness and greater efficiency in the global stage.

The transition to democracy brought new elements to Spanish political environments. Two vectors were particularly important: the implementation of the so-called Estado de las Autonomías (State of Autonomies), and the thought that one day Spain, democratic Spain, would join the European common market, which we now call the European Union and which at that time was designated as the European Economic Community (EEC). One of the problems was that there were no statistics, no jobs or studies from an autonomous perspective, not even in the case of the energy context. There were no policies or lines of action, nor any corresponding analyses regarding the consequences of joining Europe and the consequent design of the necessary policies. At the same time, and in a little-known political context, the Spanish state had to give up its powers to the autonomous regions and to Brussels.⁴⁰⁴

The compression of the dates was undeniable; one can recall, as an example, that the Statute of Autonomy of Catalonia was approved in 1979, with the start of the first government of the Generalitat of Catalonia in 1980, and only five years later, on June 12, 1985, the treaty of accession to the EEC was ratified, entering into force in 1986. Within the space of a few years, an unprecedented change of paradigms and environments occurred.

Enagás and the Democratic Environment

In the first years of operating activity of the Empresa Nacional del Gas⁴⁰⁵, by then the owner of the Barcelona plant and the contracts in Libya and Algeria, the

404. In the early 1980s, the situation described gave rise to a large number of works, studies and activities, such as those listed below, as examples, in which the author participated and which are included in the bibliography: *I Jornadas de Estudios Socioeconómicos de las Comunidades Autónomas*, organized by the Junta de Andalucía (1980), or the *Estudis i propostes tècniques per al desenvolupament de la política tecnològica i energètica del Govern de la Generalitat* (1982), as well as the *Llibre Blanc sobre la repercussió econòmica a Catalunya de l'entrada de Espanya a les Comunitats Econòmiques Europees* (1982), or the paper "*Llibre Blanc sobre la repercussió econòmica a Catalunya de l'entrada de Espanya a les Comunitats Econòmiques Europees*", at the VII Asambleu Tècnica del Gas (1981).

405. Fàbregas (2017c), pp. 17-19.

contract with Algeria was renegotiated: it went from 1 bcm to 4.5 bcm⁴⁰⁶, and the price went from approximately 0.42 cents per million BTUs (British Thermal Unit) to 1.30 dollars per million BTUs, with forecasts for a very important expansion of natural gas in Spain, for which, however, gas pipelines were needed to bring the product to the market and customers willing to consume it. The price variation between the two contracts was due to the volume requested, the existing contract took advantage of the surplus of liquefaction lines built for export to other countries, while with the increase in volume required by Enagás it had to bear all the costs of a dedicated liquefaction line.

In 1978, Enagás had practically only two customers, Catalana de Gas and Tèrmicas del Besós; in 1976 it had begun the construction of a gas pipeline through the Ebro valley to connect Barcelona with the Basque Country, which was to be completed in 1978, and which at that time was only 60% built.

On the other hand, the state's financing of Enagás during all these years was rather deficient, as it was in a permanent situation of lack of resources to carry out its investment and growth activities, if not in situations of technical bankruptcy only maintained by the state guarantee. During these years, Enagás was able to present debts of over 30,000 million pesetas with a share capital of 100 million pesetas.

In short, grandiloquent discourse and great supply contracts, but few achievements, little market development and little investment in the pipeline network to bring natural gas closer to its potential consumers. All this from a clearly deficient financial structure.

The political changes towards democracy did not bode well for figures like Luis Valero, who was with Girón de Velasco on the Board of Directors of the newspaper *El Alcázar*, chaired by General Jaime Milans del Bosch, and on the Confederación Nacional de Combatientes.

When Carlos Arias, on December 13, 1975, formed the first government of the monarchy after Franco's death, significant novelties appeared; there was a new minister secretary general of the Movimiento called Adolfo Suárez González, and José García Hernández, the former first vice-president, was no longer present.

As the months went by, Valero's situation became more complicated. *Diario 76* accused him in the first days of November of 1976 of having used the logistics of Butano — staff, trucks, etc. — to prepare sandwiches for those attending the demonstration in support of the *El Caudillo* (i.e., Franco) on October 1, 1975 in the

406. The acronym bcm stands for 'billion cubic meters'.

Plaza de Oriente, and also at the rally on November 23, 1975 for the funeral of Franco. The weekly magazine *Opinión* also published an article in which it commented that: “The government has on its payroll the most conspicuous representatives of the ‘bunker’ and the right-wing opposition; if it does not dismantle this structure before carrying out the reform, it will have to face the fight against one more enemy, the Trojan horse of the state-run companies”.⁴⁰⁷ With the appointment of Adolfo Suárez as Prime Minister in July 1976, the situation became untenable. Finally, on January 21, 1977, INI’s Board of Directors accepted the resignations of Luis Valero as chairman of Enagás and Butano, appointed Santiago Foncillas to replace him as chairman, and also appointed Joaquín Abril Martorell as director of both companies and executive vice-president of Enagás. Joaquín Abril Martorell was the brother of Fernando Abril Martorell, at that time Minister of Agriculture and later vice-president of the government. The story continued.⁴⁰⁸

In short, after years of struggles and confrontations, the leader of the sector in Spain, created by Catalana de Gas, had passed to the state, to Enagás, it was not very clear why. The action of that initial Enagás ended in the mid-1980s with the payment of hundreds of millions of dollars in compensation to Algeria for not being able to fulfill its gas purchase commitments as contracted. The investments had not been made and the market had not been developed. Public management had not been up to the task, a lot of ideology and little business efficiency.

Catalana de Gas, Pere Duran and the Political Transition

The sale of the Barcelona plant produced an important change in Catalana de Gas, as it became responsible for the industrial customers of Gas Natural, S.A. The company, which had always specialized in managing many customers, both domestic and commercial, with low consumption and high operating costs, had to learn to manage a business of large customers, with very tight margins, who introduced gas into their

407. “El bunker en nómina”, in *Opinión* (06-11-1976). Ballester (2017), p. 71.

408. Valero, when he resigned, gave a dossier to the press, self-justifying himself; the reaction of *Diario 16* was very harsh, when it published, on February 5, 1977, the article “*Sin cuenta ni razón, o los arrecogidos del beaterio del INI*”, which among other things explains that Luis Valero’s thesis was that: “Because of technocratic and banking interests, and despite the quixotic efforts of Valero and his friends, in particular José García Hernández, now president of the Banco Exterior de España, the national unionist revolution is still pending in the field of gaseous hydrocarbons.” Valero even published in 1978 the book *La Constitución y los siete enanitos* (The Constitution and the Seven Dwarfs), whose title already hints at the political line of its content.

production lines and could not tolerate a failure. In addition, to become customers, they normally had to make investments in their facilities and expected their gas supplier to be an expert in industrial burner combustion. All of this had to be learned and incorporated into the culture of the organization in order to be and survive in a clearly competitive market. An important element was that the intrinsic fuel quality of natural gas was not highly valued by the market; concerns about combustion waste and air pollution were not yet an issue and would not appear for some years to come.

The design of a democratic economy in the midst of a crisis also posed difficulties to the stability of the framework in which companies had to operate. The signing of the Pacts of the Moncloa in 1977 was very important in order to advance in the construction of a new reality, but the labor conflict was very serious during that period. One element to highlight in the first few years was that in the successive price fixings decided by the public administration for sales to TERBESA's Besòs thermal power plant, the main customer by volume of Catalana de Gas, no margin was left for the activity in order to force the transfer of this main customer to Enagás, a transfer that was completed in July of 1977.

The situation of the financial markets, an indispensable element for companies of continuous investment such as utilities, went through moments of great difficulty and lack of liquidity. Spain was still a closed financial market; banks did not give long-term loans, only bonds or debentures could be placed, but the state's own bond issues left little room for the market. Large Spanish companies began to sign syndicated loans in the European market; Catalana de Gas began this activity in the late 1970s. It should be noted that Catalana de Gas y Electricidad was the first company in the gas and electricity sector to publish an audit in Spain in 1977.

Catalana de Gas continued with its activity of distribution of city gas and natural gas, but with an important change of scale, serving a much larger market upon being able to access the substantial sector of industry. The investment effort that would be necessary for the development of natural gas led CGE to concentrate entirely on gas; in 1976, it sold all its diversification activities, as will be explained, to the new Corporación Industrial Catalana (CIC), successor to Gas Natural, S.A.

As stated above, the electricity sector was also abandoned; in 1976, the electricity assets that had been leased to HECSA and the Compañía de Fluido Eléctrico for so many years were transferred to HECSA. The emblematic falls of Seira, in the Pyrenees of Huesca, was excluded in order to maintain an important and historical electrical asset that would allow it to continue with the denomination of Catalana de Gas y Electricidad, and would not oblige it to alter the name and the company's

object. In addition, CGE's remaining shareholding of 4.83% in HECSA was also transferred to CIC. The falls of Seira would be transferred to HEC in 1987.⁴⁰⁹

In this context, another important element, political relations, clearly evolved, allowing the company to take advantage of the position of Pere Duran, who, since before Franco's death, maintained relations with one and all; he could be found equally at a dinner with Prince Don Juan Carlos at the home of Joaquín Garrigues Walker in 1966, and then speaking to the illegal Comisiones Obreras in 1967. He had true admirers, like Josep Pla, he had relations with Tarradellas in exile, he spoke with representatives of political parties in hiding, etc. Perhaps we may recall Jordi Pujol's opinion in his memoirs: "Duran Farell was very welcome in Madrid. He had contacts right and left with the communists and the late Francoists, and he also believed that after Franco's death democracy could be established". Duran also had a relationship with the military, and participated continuously in the CE-SEDEN (Centro Superior de Estudios de la Defensa Nacional — Advanced Study Center for National Defense), because of the relationship between energy and national defense.⁴¹⁰

Manuel Fraga Iribarne, second vice-president for Home Affairs and Minister of the Interior in the government of Carlos Arias, thought that Pere Duran would be the ideal person to replace Joaquín Viola in the mayor's office of Barcelona, and started talks on the subject. The alternative did not bear fruit due to the replacement of Fraga by Rodolfo Martín Villa as minister, who already had a candidate from his political ideals, Socias Humbert.

Duran was a astute analyst of the political moment and when he detected that the expectations of the citizens were ahead of the political changes, already in the time of Suarez, he asked the king to speed up and simplify the processes so as not to disappoint the Spanish people in the advance towards democracy. When Salvador Sánchez Terán, a civil engineer like himself, was appointed civil governor of Barcelona, and it was necessary to organize a discreet dialogue with the democratic opposition, the channel would be Pere Duran, and the meeting place would be the privacy of his home in Premià de Dalt with his wife Montse. Pere Duran was in touch with everyone. Jordi Pujol had helped him in

409. HECSA also had its crisis in 1985; it was acquired by Hidroeléctrica Española, and later with the different reorganizations of the electricity sector its assets were divided among several companies. The emblematic Seira plant continues to operate in 2018 within the framework of Acciona, and the Vilanova plant, which was converted into offices at the time, is occupied by the headquarters in Catalonia of Endesa, a subsidiary of ENEL.

410. Fàbregas (2014b), pp. 142-153.

his dialogue with Comisiones Obreras, and Miquel Roca and Narcís Serra had been the two managers of La Ribera, S.A., the company created to open Barcelona to the sea in the 1960s. Ramon Trias Fargas was in charge of the research department at the Banco Urquijo in Barcelona. Duran knew the socialists Joan Raventós and Josep Pallach, Heribert Barrera of Esquerra Republicana de Catalunya, but also Santiago Carrillo of the PCE, and Antonio Gutiérrez Díaz of the PSUC, in short, the entire political spectrum. He listened to everyone, talked to everyone, and insisted like few others that all democratic organizations should be legalized: "If we exclude the Communist Party and the Comisiones Obreras from democracy, the future may slip out of our hands".⁴¹¹

In the 1977 Senate elections, it was rumored that Pere Duran might run, or that he might be appointed by the king, but while Duran was always close to politics, he never got involved with any party, even then. When the 1979 municipal elections were held, the UCD offered him the presidency of the party in Catalonia; Duran tried to represent all the center parties, a move opposed by *Convergència Democràtica de Catalunya*, and he withdrew. In May of 1979 it was Tarradellas who wanted to appoint him *conseller* in the provisional government of Catalonia's Generalitat to replace Manuel Ortínez, but he likewise was unable to involve him.

In short, an open and profoundly democratic figure who welcomed dialogue, whose significance and prominence increased with the end of Franco's dictatorship, in contrast to what occurred to Luis Valero.

The Industrial and Financial Crisis of the 1980s

With an economy still under construction after the 1977 Moncloa Pacts, and with almost no time to react, the second energy crisis appeared in 1979, the one that occurred when Khomeini seized power in Iran, and which caused a major upheaval in the situation of Spanish companies.

From 1980 onwards, the country had to face a complex process of adjustment that clearly affected the banking and basic industry, which was quite obsolete and uncompetitive; areas such as the steel industry and shipbuilding were the most affected, but the serious social unrest and a fall in demand had consequences for all sectors of the economy. All this produced a difficult situation of industrial

411. "Política empresarial y evolución democrática". Jornada Hostalric Cercle d'Economia (17-07-1976).

reconversion which, coinciding with the process of political transition, gave rise to very difficult years — a very complex evolution towards new realities —, made difficult by the fear of a political regression which culminated in the attempted coup d'état of February 23, 1981.⁴¹²

The banking situation in Spain during these years was extremely precarious. As Pablo Martín Aceña explains, in the period 1977 to 1987, to a greater or lesser extent, the crisis reached 56 banks of the 110 that existed as of December 31, 1977. All of which led to the creation of the Fondo de Garantía de Depósitos (Deposit Guarantee Fund) in November of 1977, as an element to soften the impact of the crises on the Spanish banking system. Among all the cases, it is perhaps worth highlighting, due to the size of their external resources, their importance and their concentration over time (February 1982-January 1983), the crises of Banco Unión, Banca Catalana-Banco Industrial de Cataluña, Banco Urquijo, and that of the Rumasa group, led by the Banco Atlántico.

An example of the harshness of the crisis was the disappearance of Banco Urquijo, the country's industrial bank par excellence, which had supported Catalana de Gas y Electricidad since the creation of Hidroeléctrica de Cataluña in 1946, with Chairmen Juan Bertrand and Pere Duran on its Board of Directors. The bank lost its independence when it was bought by Banco Hispano Americano in 1983, later Urquijo was merged with Banco Unión and finally sold to Banco de Sabadell.

In this context, the crisis of Corporación Industrial Catalana, S.A. (CIC), the company into which Gas Natural, S.A. had been transformed, would appear after the sale of the Barcelona regasification plant and the contracts from Libya and Algeria to Enagás in December 1975.

Gas Natural, S.A., after the sale of its assets, had cash on hand and had to consider a new direction. There were two possible alternatives: either to return the money to the shareholders and liquidate the company or to redirect the activity with the available funds. The second was chosen, which led to the withdrawal of Banco Popular Español's shareholders. In the first few months of 1976, a General Meeting of Shareholders changed the name of the company to Corporación Industrial Catalana, S.A. with the corporate purpose of investing in companies in cutting-edge sectors, with technological content and a multinational, global and collaborative vision with third world countries, but diversifying investments in different sectors of activity in order to reduce risk accordingly. Pere Duran continued

412. Fàbregas (2014b), pp. 154-162.

to chair the company, as did Francesc Tardà Meler as managing director, in a bid to help a new process of industrialization and modernization of the structures.

CIC was set up as a company to promote industrial companies, as do modern funds, with the aim of achieving a phase of growth and development of its investee companies that would allow them to disinvest in a few years with capital gains to continue the cycle. However, its arrival on the financial markets did not coincide with a growth phase of the Spanish economy, but rather a very difficult period, with many problems and tensions.

The risk mix was initially designed to provide active businesses from which profitability could be obtained, together with emerging businesses that would require a maturity period. In order to implement this design, CIC reached an agreement with Catalana de Gas, which had initially leased it the industrial natural gas distribution network, to sell it to it for around 65% of the share value of La Catalana's subsidiary companies already in operation and operating in different sectors, such as: Naviera de Productos Licuados (Naproli), Terminales Químicos (Terquimsa), Petrofibra, Obras y Servicios Hispania (OSHAS) and Hidroeléctrica de Cataluña, S.A. (HECSA). The remaining 35% would be collected during the years 1977 to 1983.

Investments in new sectors under development began rapidly with the acquisition or promotion of the following companies: Enclavamientos y Señales (EYSSA), Proalan, Sinorkao, Molins y Puigarnau, Maretro, Empresas Constructoras Asociadas, Aproalfa, Fona, Comercial de Manutención (CODEMSA), Hispanoland, Coprima, Cida-Hidroquímica and Barnaexport. The shareholders at that time were Catalana de Gas (36%), Urquijo (10%) and Hispano (6%), and the remaining 52% was distributed among small shareholders. The company was still listed on the stock exchange.

The situation in the first months of 1977, when the first signs of crisis began to appear in the Spanish economy, was one of growth, with positions being taken in electronics, fine chemicals and foodstuffs, and with activities also beginning in Gabon and Algeria. An advisory body to the chairmanship was also created at that time, made up of Pere Grau — replaced by Joan Romagosa in the general management of Catalana de Gas —, Francisco Sanuy and Emilio Fontela. But time was compressed, everything was moving very fast.

The global difficulties of the economy and the subsequent industrial crisis would not allow for the positive development of CIC, which had a very difficult trajectory during its years of existence. In 1977, the first problems arose at EYSSA, in which the Compañía de Electrónica y Comunicaciones, S.A. (CECSA), owned by Enrique Masó,

a company dedicated to consumer electronics, component manufacturing, defense electronics and avionics, took a stake. In correspondence CIC took a stake in CECSA. But the following year, EYSSA was already in suspension of payments.

The complicated situation continued in 1979, with a new managing director, Joan Grau, and towards the end of the year the possibility of finding a way out was raised for individuals, small shareholders, who had passed from a gas company to an industrial conglomerate. The opportunity arose with the approach of the Banco de Bilbao, which at that time wanted to broaden the shareholder base of its Corporación Industrial, and an exchange offer was developed for CIC shareholders. The offer consisted of exchanging 3 shares of CIC for 2 shares of Catalana de Gas, 2 shares of Hidroeléctrica de Cataluña and 2 shares of Corporación Industrial Bancobao. The operation was carried out in April of 1980 and was a success. The participation of small shareholders increased from 52% to 13%; Catalana de Gas reached 42%; Banco de Bilbao (16%), HECSA (4.53%) and several financial institutions (8.02%) started as new shareholders, and Urquijo and Hispano maintained their positions.

Once the participation of the small shareholders had been reduced, it was decided not to distribute a dividend against 1979 results and to write off 1,665 million pesetas against the 1973 balance sheet adjustment account. With the decisions adopted, CECSA was able to make it through 1981, when it was awarded the first international tender for civil air traffic control in Spain, worth 450 million pesetas, an operation that included the deployment of an extensive battery of radars of its own manufacture distributed over Spanish territory.

The early 1980s, as has been explained, was a very difficult period for the Spanish economy as a whole, with a serious industrial and financial crisis, which clearly affected CIC. In order to be able to withstand the situation which was of an already difficult dimension for Catalana de Gas, an important entry of Hidroeléctrica de Cataluña into the capital of CIC was organized and the managing director of HECSA, Jaime Carrasco Belmonte, chief executive of CIC, was appointed, who in turn elected Miguel Ruano as managing director. The change also reached CECSA, where participation was increased to 67%, and Jaume Llopis, who came from Moulinex Spain, was appointed CEO-managing director, at a time when a new National Electronic Plan could perhaps provide new frameworks for solutions.

The newly formed team immediately — in 1982 — faced an additional write-down of 1,771 million pesetas of the holdings, reducing the share capital by 40% (673 million pesetas) and the company's reserves by 1,098 million pesetas. This was followed by a capital increase of 2,020 million pesetas. The new increase was subscribed

basically by Catalana de Gas and the Banco de Bilbao in their respective proportions, as well as by HECSA, which subscribed approximately 28% of the operation.

The difficulties continued, and in May of 1983, comments appeared in the press indicating that Pere Duran had decided to leave his post in the companies in which he was involved, which was no more than rumors without further substance. The one who did leave was Jaume Llopis, who left CECSA in November to go to another company; his stay with the company had been 20 months, and he was replaced by Miguel Ruano, CIC's managing director. In December of 1983, CECSA's founder, Enrique Masó, also left the company and sold his stake to CIC.

At that time the competition from German and Japanese electronics, in the so-called brown line, was decisive for the continued disappearance of Spanish companies, and so Iberia Radio, Lavis, Vanguard, etc., vanished. The national dimension of the companies in the sector did not allow them to compete with the multinationals that designed and produced products with world markets in mind. There was a lack of critical mass, technology, product development, sales network and financial support. The last company to disappear was CECSA, which filed for suspension of payments on January 2, 1984 with 7 billion pesetas in debts. The impact on CIC was significant, since the efforts made to try to ensure the continuity of the investee had been concentrating CIC's risk in the electronic sector, which, while in 1981 it was 31% of the investment portfolio, in 1983 it already represented 53% of the total. The year 1984 was marked by the consequences of CECSA's situation, although a 7 x 15 capital increase was also carried out, which reduced the participation of small shareholders to only 4.8% of the capital.

Finally, in 1985, the final phase began, Catalana de Gas repurchased the shares held by the banks, restructured the capital with a reduction in the nominal value of the shares from 600 pesetas per share to 125 pesetas per share, agreed to delist the shares from the stock exchange, and executed the corresponding takeover bid. This was followed by an orderly liquidation that lasted a few years, with the capital distributed practically between Catalana de Gas and Hidroeléctrica de Cataluña at 50%.

The Corporación Industrial Catalana arrived to invest in an extremely difficult time. Later, Pere Duran would add that it was forced to invest very quickly; half of the Spanish banking sector disappeared in those years; the main sectors in which CIC invested were very different from the natural gas sector in which the available management teams began. New sectors, new problems, in short, crisis and more crisis, with a permanent concern to try to minimize the impact on the small shareholder, and build possibilities and alternatives.

The Situation in the Natural Gas Sector

Also in the early 1980s, a dispute between Enagás and Sonatrach reached its zenith over negotiations on supply prices, but mainly because Enagás, which had acquired the facilities of Gas Natural, S.A. had done very little in 1975 to develop the natural gas market in the country, and it could not take on the amounts it had committed itself to withdraw from Algeria, giving rise to substantial compensation as specified by the terms of the contract. This situation forced the government to get involved in the issue and called into question the very existence of the natural gas sector in Spain. After many complications, this difficult situation ended well, and ultimately produced a strong boost, a definitive boost, for natural gas in Spain.

The structure of the manufactured gas sector in Spain was constituted in 1978 by 17 companies that had plants in 31 municipalities, led by Catalana de Gas y Electricidad, followed by Gas Madrid and Compañía Española de Gas, the latter in turn a subsidiary of Catalana de Gas. However, in the distribution of natural gas only two companies operated, Catalana de Gas, which supplied 51 municipalities, and Gas Figueres, S.A., which supplied that municipality. The supplies, regasification and transport of natural gas were managed by the public company Enagás⁴¹³ (Table 51)

The introduction of natural gas into Europe in the 1960s had been remarkably fast, reaching 13% of primary energy consumption in the European Economic Community (EEC) by 1973, and as high as 18% by 1980. In the province of Barcelona, where Catalana de Gas operated, the trajectory had been similar to that of Europe, with 11% in 1973 and 18% in 1979. However, in the rest of Spain, where Enagás was to operate, the situation developed with considerable delay, as the supply began in 1980, eleven years later than in Barcelona.

The situation of the Spanish energy market in comparison with the European market was marked by per capita energy consumption that was only half the level of the EEC, with a greater share of oil to compensate for the lack of natural gas in the country. The residential market in Spain accounted for 21% of energy consumption, while in Europe it reached 40% due to the standard of living and climatic circumstances. Oil consumption was characterized by a low proportion of gasoline and a highest proportion of fuel oil, which was a consequence of the low level of motorization and the lower sensitivity to the problem of air pollution.

413. Fàbregas (1980), pp. 1-19; Fàbregas (1981), pp. 1-25.

Table 51. Gas companies in Spain (1978)

Company	Date of incorporation	Subsector
Catalana de Gas y Electricidad	1843	MG, NG
Fábrica Municipal de Gas de Bilbao	1885	MG
Fábrica Municipal de Gas de San Sebastián	1889	MG
Hidroeléctrica del Cantábrico	1919	MG
Vilafranquesa de Gas	1919	MG
Gas Madrid	1921	MG
Compañía Española de Gas	1923	MG
Gas Figueres	1923	MG
Compañía del Gas de Zaragoza	1927	MG
Gas y Electricidad	1927	MG
Gas de Vic	1935	MG
Juan Cascante Rogé	—	MG
Gas Tarraconense	1948	MG
Compañía Leridana de Gas	1949	MG
Fábrica de Gas Costa Brava	1956	MG
Empresa municipal de servicios públicos de Tortosa	1969	MG
Gas Gerona	1971	MG
Gas Igualada	1971	MG
Empresa Nacional del Gas	1972	NG

Source: Fábregas (1980), p. 7. Abbreviations: MG: Manufactured Gas; NG: Natural Gas.

In the case of gas, the differences were even more marked. Per capita gas consumption in Spain, including manufactured gas, natural gas and LPG, was 16 % that of Europe (1979).⁴¹⁴ Additionally, in Spain, 66 % was bottled gas and 34 % was piped gas, while in Europe 93 % was piped gas and only 7 % was bottled gas. There was a lack of gas infrastructure and gas tradition in many areas of the country, with only one in every thirty inhabitants having gas, a figure five times lower than that of Europe.

In this context, the last UCD government prepared the 1979 Plan Energético Nacional (National Energy Plan) (PEN), which was Spain's late reaction to the first

414. Fábregas (1981), pp. 17-22.

oil crisis of 1973, at a time when the second crisis (that of Khomeini in Iran) was already underway. It was late, but, in the meantime, Franco had died, a dictatorship had given way to a democracy, and the Spanish Constitution of 1978 had been approved.

The plan gave a favorable view of natural gas, stating: “Natural gas should be introduced as much as possible because it is a lower-cost fuel in foreign currency than oil and much less polluting”. However, the quantification fell short, as it projected that natural gas would rise from 2.1% of primary energy demand (1977) to 5.3% by 1987, when it was already 19% in Europe.

The figures fell short but they were still too optimistic. By the last year of PEN’79 the demand for gas in the country had not yet reached the level foreseen for the first year of the plan. Enagás’ business dynamics, which in 1983 had not even reached Valencia or Bilbao with its gas pipelines, did not help. The actions of the government likewise did not help, which in January of 1980 raised the sale prices of natural gas to the residential market in Spain by 40%, additionally taxing the product with a much higher excise duty than that of its competitors in the industry, fuel oil, which caused an immediate drop in the market, precisely that of energy, which in theory was to be stimulated.

The Complex Enagás-Sonatrach Relationships

The criterion for setting international prices for natural gas was that producer compensation and supply chain costs should make it possible to compete in the final markets with fuel oil, one of the lowest value products of the refineries, but the one most intensively used in the industry. In short, and more so since the 1979 energy crisis, oil prices on the market had risen sharply and with them the remuneration of producer countries, while in terms of gas, prices were limited by a price scheme more designed to facilitate the introduction of natural gas into the markets than to reward producer countries. In sum, the question was whether gas prices should be adjusted to those of fuel oil, or to those of crude oil, which were clearly higher.

The situation continued until, at the 57th OPEC Conference in Algiers in June of 1980, the Algerian delegation managed to reach a clear policy change, agreeing on “the determination of the OPEC countries to align gas prices with those of oil in order to achieve a coherent marketing policy for their hydrocarbons. The main

gas-importing countries should consider the oil-gas price equivalence as a necessary incentive to economically develop gas resources and, consequently, to allow gas to contribute substantially to the satisfaction of world energy needs". This position represented virtually an attempt to double natural gas prices.

In this context, from 1981 onwards, Algerian Sonatrach started negotiations with Enagás to increase prices, while Enagás tried to take advantage of the opportunity to reduce the quantities contracted, which could not be made use of in any way due to the low level of activity developed in creating new markets for natural gas in Spain. The threat of the take-or-pay clause of the contract was getting closer and closer. Beginning in 1979 Enagás had to withdraw 4.5 billion cubic meters per year but did not exceed 1.5 billion cubic meters, a third of what it was contracted to withdraw.⁴¹⁵ When France accepted the Algerian price philosophy in 1981, the situation worsened considerably.

The PSOE's victory in the October of 1982 elections led to a rethink. The Partido Socialista (Socialist Party) had always been close to Algeria, providing political support in the case of the Front Polisario. Negotiations were raised to a higher level when the Ministry of Industry became involved, as did the vice-president of the government, Alfonso Guerra, who travelled to Algiers to discuss the situation, although he questioned the Spanish actions: "We understand that this contract is naturally in force, but we wonder what the interests of that administration were in signing a contract for 45,000 million thermal units, when it was perfectly aware of the technical inability to withdraw a figure not even close to that limit".⁴¹⁶

Despite all the efforts, for two years there was practically no progress toward a solution, while the process became more and more difficult. Sonatrach decided to take Enagás to the Arbitration Court in Geneva in July 1984. At that time, the problem had already begun to affect Spanish exports to Algeria. From another perspective, perhaps more interested, there were those who wondered whether Spain could simply do without natural gas; this was the famous theory developed in 1981 that Spain had arrived too late to the subject of natural gas and that, therefore, what had to be done was to liquidate Enagás and that natural gas should disappear from the Spanish energy diet, perhaps in order for Spain to become the

415. In a report to INI dated November 22, 1977, by Joaquín Abril Martorell, Enagás' executive vice-president, Joaquín Abril Martorell, already stated that: "During the period of Luis Valero, new supply contracts were concluded with Algeria with a rate of supply that was much higher not only than the marketing possibilities, but also the possibilities for the physical execution of the gas pipeline that had to carry these supplies". Ballesteró (2017), p. 110.

416. *El País*, March 26, 1983.

most energy-strange country in Europe. These theories had circulated, at the time, in the Instituto Nacional de Hidrocarburos where Miguel Boyer worked as director of Planning and Studies, before becoming minister.⁴¹⁷

Finally, after many efforts, an agreement was reached, which was ratified on February 28, 1985 by Elías Velasco and Youced Yousti, consisting of reducing the overall contract quantities by 26 %, with an extension of the term by 10 years, from 1994 to 2004, adapting the build up to the new forecasts for the construction of gas pipelines in Spain.

Spain agreed to pay Algeria \$500 million in compensation (\$200 million for the damage caused by the reduction in the activity of the Skikda liquefaction plant, and \$300 million for price differences in the period 1979-1984), and also accepted the European price of \$3.89 per million BTUs.

The dispute was over, but the natural gas market had to grow rapidly and there were still some doubts; the press reported: “Energy resources show that only a radical change in the management capacity of the public company [Enagás] will make it possible to achieve the objective of extending the use of natural gas”.⁴¹⁸

A New Executive Board of Directors

At that time, Catalana de Gas had no major shareholders, and the Board was made up of a majority of what we would now call independent members, plus some members who had initially been appointed in the proprietary category, but who had been diluting their stake. In 1984, Pere Duran retired as chairman and proposed an interesting experiment in corporate reorganization. The entire Board resigned as a bloc, and a new Board of Directors was established, composed entirely of executive members.

The design of the operation involved the appointment of Pere Duran as chairman of the General Shareholders’ Meetings, leaving the chairmanship of the Board of Directors. Likewise, an Advisory Committee was set up to chair the Board of Directors, made up of all the members of the Board of Directors up to that time: José María Lozoya Augé, Eusebio Bertrand Mata, Pedro Giró Minguella, Luis Desvalls Trías, Enrique Gabarró Samsó, Eusebio Bertrand Batlló, Arturo Suqué Puig

417. Fàbregas (2017c), pp. 19-20; Ballesteró (2017), pp. 109-122.

418. *La Vanguardia*, February 23, 1985.

Table 52. Catalana de Gas y Electricidad. Board of Directors (1984)

Name	Position
Pere Grau Hoyos	Chairman
Joaquim Maluquer Sostres	Vice-President
Joan Romagosa Petit	CEO
Josep M. Batalla Catà	CEO and Secretary
Francesc Badia Vidal	Member-Director
Pere-A. Fàbregas Vidal	Member-Director
José Manuel Manzanedo Díaz	Member-Director

Source: Catalana de Gas y Electricidad. *Memoria* 1984.

and Raimundo Noguera Guzmán, to whom Joaquim Maluquer Sostres would be added as secretary (Table 52).

The new Board of Directors appointed on September 26, 1984, was presided over by Pere Grau Hoyos, and was made up of senior executives of the company and its group, with the incorporation of Joaquim Maluquer Sostres who would act as a liaison with the Advisory Committee. Later, in 1985, Miquel Ribas Pujol and Josep Musté García, also directors of the company, joined the Board.

The project raised the need to construct a new style of governance, since although the only legally responsible body for everything was the Board of Directors, the new chairmanship of the General Meeting and its Advisory Committee had to root the company within its surroundings — what in modern terms we call stakeholders —, being able to make the suggestions it considered appropriate to the Board, in the always difficult task of better institutionalizing the relations between the company and the society that surrounded it. Pere Duran explained to the press that: “This body will be able to transmit to the Board of Directors the real content of the social demands and to transmit to the civil society the concerns and services of the company. Hence the proposed new structuring of the corporate bodies of Catalana de Gas y Electricidad, S.A.”, and added: “We are all needed. No one can leave, but it is a good idea for all of us to relocate”.⁴¹⁹ Duran was committed to an enrichment of the formation of social will from an integrative perspective of different and complementary sensibilities, valuing experience, but relocating it.

419. NFHA.CGE. *Junta General de Accionistas. Discurso Pere Duran Farell* (15-05-1984).

The interpretation of these changes is very complex, since there were no precedents anywhere for this type of corporate action, and yet there were some surprising points of conceptual modernity. The situation was not easy: the industrial crisis, the evolution of CIC, the questioning of the natural gas sector over the dispute with Algeria. Changes, difficulties, a search for future paths.

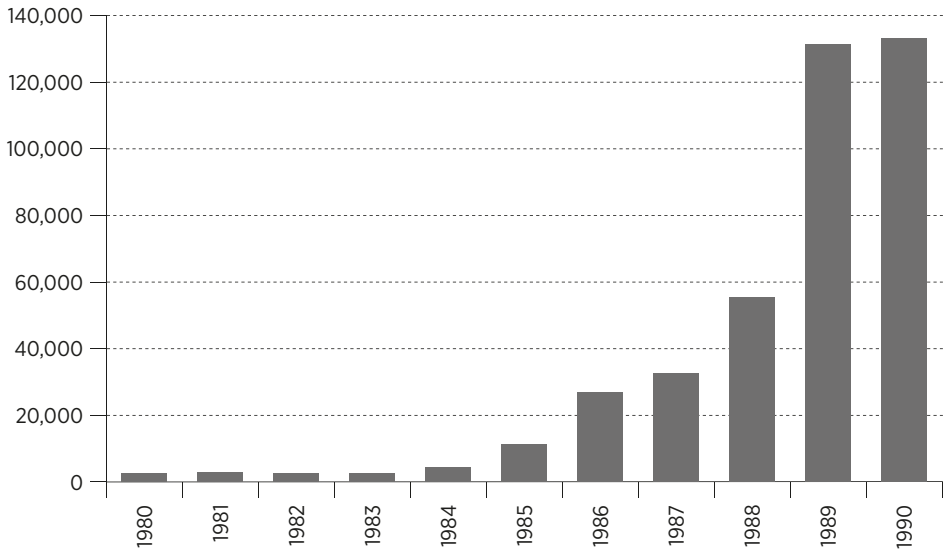
The consequence for Catalana de Gas of Pere Duran's action was the appearance of a totally executive Board of Directors that indicated that there were no major shareholders behind it and that, therefore, when the existing problems were resolved or oriented, the company would clearly be attractive to new investors, who would not need to hold further discussions with the previous historical control groups.

In the years of activity of the new Executive Board, however, significant changes occurred in the company and its surroundings:

- The negotiation of the Gas Protocol was an important contribution to the negotiation of a new regulatory framework that would clarify the relations between the Ministry of Industry, Enagás and the rest of the companies in the sector, providing definitive recognition of the company's position in the market and giving Catalana de Gas great growth possibilities, opportunities of an unthinkable dimension until then, as well as profitable growth, with stimuli for dynamism and efficiency. The Protocol was signed in 1985.
- The new Board also had to administer a strict financial program to deal with the latest consequences of the CIC crisis and its definitive reorganization, which was achieved with rigorous financial planning and major management efforts in 1986.
- The definition of a framework for profitable future growth of the core business and the elimination of the uncertainties contributed by the CIC matter, together with the efforts of the new executive team, led to a significant change in the company which, in the period 1980-1990, led to a 3-fold increase in turnover, from 18,991 million pesetas to 56,049 million pesetas, while net profit increased from 626 million pesetas to 6,986 million pesetas, an 11-fold increase.

Perhaps the most significant element was the change in the value of the company on the stock market, which went from 2,685 million pesetas in 1980, to reach 133,138 million pesetas in 1990, the end of the period considered. The stock market capitalization of the company in those momentous 10 years was multiplied by 50 times, mainly from 1985 onwards. The growth was significant until 1988, basically

Graph 6. Catalana de Gas. Market capitalization (million pesetas)
(1980-1990)



Source: Company reports.

due to the better expectations and reality of the business activities, and absolutely out of control in the following two years, due to the entry of the future dominant new shareholders who would build the company of the future (Graph 6).

The evidence of the serious lack of major shareholders, which allowed the company's lines of action to be stable and continuous, led to the situation becoming very complex from the summer of 1987 onwards, with different surprising entries of new shareholders. After various changes and movements, the first changes in the composition of the Board took place in 1989 with the entry of proprietary representatives. The definitive evolution took place in 1991, with the merger of Catalana de Gas and Gas Madrid, to give rise to the new Gas Natural SDG, with the return of Pere Duran to the chairmanship, and with two important shareholders: "la Caixa" and Repsol.

The Gas Protocol

In October of 1982 the PSOE won the elections in Spain, bringing to power a left-wing party for the first time since the Second Republic. The Socialist election

program established the following energy policy guidelines: “The first thing is to save and improve energy consumption efficiency; the second is to give greater weight to coal and natural gas and less to nuclear energy, and the third is to avoid the current over-installation of electricity generation and in the conversion plans of the refining industry”.

The energy situation in Spain was complex and, in addition to the traditional resources of improving efficiency and, in the case of the left, protecting the miners, there were three fundamental objectives: Firstly, to bring natural gas up to normal levels in Europe, for which the dispute with Algeria had to be ended and the sector revitalized; secondly, to make room for gas to convert refineries to produce more gasoline and less fuel oil, which was the norm in Europe; and thirdly, to ensure that the electricity sector, which was facing financial problems due to over-investment in nuclear power plants, moderated its investments in order to avoid their disappearance due to a global financial default, or non-payment.

In the gas sector, in 1985 many issues had moved forward to allow for a change in policy, including the elimination of discriminatory gas taxation through the 1983 *Presupuestos Generales del Estado* (General Budget Law); the new framework with the development of national gas fields, starting with the supply from Serrablo (1984) and Bermeo (1986); and the major start-up of the Barcelona to Euskadi and Valencia gas pipeline inaugurated in 1984, albeit with a six-year delay over the originally plans.

In the new National Energy Plan of 1984, the government conceptualized natural gas well, but was careful in its quantification, according to what was indicated at the time, due to the existence of the negotiations on the dispute with Algeria, which were finally resolved in 1985.

In short, all the basic elements were present to establish a solid, progressive and rapid gasification of the country, correcting the historical backwardness of the sector in Spain in relation to the European Union. To this end, the Ministry of Industry and the companies in the sector set up the *Comité de Ordenación del Sector* (Gas Sector Regulation Committee), with different working groups⁴²⁰, which managed to prepare and reach consensus in an 18-month negotiation on the rules

420. As an example, Nemesio Fernández-Cuesta took part in the *Grupo de Trabajo de Política de Márgenes de las Empresas Distribuidoras de Gas Canalizado* (Working Group on Margins Policy of the Distribution Companies of Channeled Gas) as representative of the administration, and as representatives of Enagás/Butano: Antonio Blanco, Antonio González Adalid, Félix Ibáñez and Antonio Téllez de Peralta, and finally, as representatives of the private sector, Pere-A. Fàbregas (Catalana de Gas), Alberto Valdés (Gas Madrid) and Juan Antonio Odriozola (UNIGAS).

and framework so that, if an agreement were reached with Algeria, the gas sector in Spain could make up for the delay at high speed.

The agreement with Algeria was formalized in February of 1985, and on July 23 the new framework for the sector was signed, the *Protocolo de Intenciones para el Desarrollo del Gas en España* (Protocol of Intentions for the Development of Gas in Spain), which would result in an unprecedented increase in investment activity and growth and expansion, both in new distributions and in customers; the sector's historical backwardness in relation to Europe was thus being rapidly corrected.⁴²¹

The Protocol set itself the objective of increasing gas sales in Spain from 17,000 to 50,000 million thermies between 1985 and 1992, with investments of 168,000 million pesetas programmed for the period. In the established horizon it was expected that all the autonomous communities of Spain would have natural gas supply, with the exceptions of Galicia, Extremadura and the islands. A new rate policy was also introduced, which was to be definitively competitive with the prices of the energies it replaced, and a margin policy with clear incentives for investment and growth and penalties for inactivity, protecting Enagás' final financial balance.

In order to evaluate the effort that had to be made, it must be borne in mind that the investments made by the sector throughout its history up to 1984 amounted to 164,000 million pesetas, that is to say, the plan was to double the assets of the sector in seven years, multiplying sales by three times.

The results were spectacular, thanks to the efforts of all the actors, with a truly unprecedented rate of expansion, dynamism and growth. The leap forward of the Spanish gas industry during the period 1985-2008 was unusual in an infrastructure sector, the differences with Europe were reduced and perfectly comparable parameters were achieved, with a cumulative annual growth in gas consumption of 13%, maintained for 23 years. A unique case (Table 53).

Events clearly accelerated after the signing of the Gas Protocol in 1985. In 1987, the Gas Law was published establishing the new legal framework for the sector, and natural gas was also brought to Madrid. Since the beginnings of natural gas in Barcelona in 1969, 18 inexplicable years had passed before the new energy reached the Spanish capital. By 1990, natural gas sales in Spain had doubled.

Meanwhile, in 1986 Spain had joined the European Economic Community, which was making progress in its energy liberalization policy, with issues such as the single energy market and third party access to the gas networks. It also proposed the disappearance of the *Monopolio de Petr6leos* and the traditional

421. Fàbregas (2017c), pp. 20-21; Ballesteros (2017), pp. 123-132.

Table 53. Evolution of the gas sector in Spain (1985-2008)

Indicators	Units	1985	2008
Natural gas / Primary energy demand	%	3.1	24.3
Municipalities with service	Number	159	1,409
Gas networks	Thousands of km	9	68
Clients	Millions	1.5	6.9
Natural gas sales	GWh	26,700	443,800

Source: SEDIGAS (2009) and by the author.

CAMPSA in a fixed term, which led to the creation of Repsol, S.A. (1987), as well as how to prepare for the fall of barriers to the actions of European Community companies in the country, with the profound changes that this could entail in the energy sector.

Catalana de Gas in the New Situation

Faced with the growth expectations that appeared in the sector, Catalana de Gas accelerated its programs. The new Board, chaired by Pere Grau and made up entirely of executive directors with extensive experience in the sector, built and set in motion an organization aimed at the rapid growth of the core business, gas, with clear elements of efficiency and a demand for performance.

In accordance with the Protocol and subsequent plans, Catalana de Gas took on gasification in Catalonia and acquired Gas Girona, Gas Igualada and Gas Vic from Butano.⁴²² Butano acquired a 25% stake in Gas Madrid (1986) and a 33% stake in the new company Gas Andalucía (1987), in which Catalana de Gas and the Instituto de Fomento de Andalucía had a stake. Butano also created distributors in Palencia, Valladolid and Rioja.

The operation to change gas in Barcelona was also restarted, culminating in the period 1985-1990, when all customers in the city were able to consume natural gas directly. All this allowed an agreement to be reached in 1986 with the City Council to cede the land of the old gasworks to the city, and thus collaborate in the realization of the 1992 Olympic Games, which would be clearly emblematic for the city. Without

422. Sudrià and Aubanell (2017), pp. 98-193, 121-127 and 138-142.

this land, it was impossible to open Barcelona to the sea and to build adequate facilities; it must be borne in mind that the Olympic Village and the Olympic Port, among other facilities, had to be located in the area. This opening to the sea culminated the efforts that had begun in 1965 by the industrialists of the area, including Catalana de Gas, to close down the shanty towns, the plots abandoned by industry and the degradation of the area, through a large project that had to wait more than 25 years and was led by the municipality taking advantage of a great opportunity.

In order to make the commitment to the growth of the gas sector clearer, in 1987 the company decided to change its name for the third time in its history: from Catalana de Gas y Electricidad it became Catalana de Gas, S.A. The word “electricity” in those times of difficulties in the electricity sector due to the overinvestment made basically in nuclear power plants led to a decrease in the value of shares on the stock market. In the same operation, the last remaining falls in the company’s possession was sold to Hidroeléctrica de Cataluña, the historic El Run falls on the Ésera River, in the province of Huesca, and the old building on Calle dels Arcs, 10, was bought back to enlarge the offices of Portal de l’Àngel; HECSA, meanwhile, moved its headquarters from Calle dels Arcs to the old, appropriately refurbished Vilanova power plant.

The concentration on gas, the sector’s capacity for growth, and profitable growth through the frameworks established in the Gas Protocol, and a highly professionalized team allowed the company to move forward and made it increasingly attractive to both the domestic and international financial markets. But this increased exposure also highlighted a major weakness: Catalana de Gas did not have a hard core of shareholders to protect it from possible inflows into its capital stock from other investors.

This situation led to the start of unsolicited entries into the shareholdings in the summer of 1987. To achieve a certain degree of mutual protection, in February of 1988 a joint investment company was set up in the shares themselves and in other businesses of Catalana de Gas, Asland and Sociedad General de Aguas de Barcelona (SGAB), initially called Promocinser, S.A. and subsequently AAC Grup, S.A. However, matters moved very fast: in May the Caja de Pensiones announced that it owned 13% of Catalana de Gas. INH/Repsol’s first approach to Catalana del Gas was made in September of 1988 to discuss a possible Memorandum of Understanding to organize the gas industry in Spain, integrating assets and will, but it did not succeed. Repsol did obtain permission from the chairman of the Board of Directors of Catalana de Gas to subscribe convertible bonds, which allowed it to

hold shares in the conversions of December of 1988 and April of 1989. Also in the last months of 1988, the Board reached an agreement with the Caja de Ahorros y Monte de Piedad de Barcelona, which at the end of the year held approximately 3% of the shares.

In short, in 1988, construction began on the stock holdings that would be present in the future for Catalana de Gas: Caja de Pensiones, with 13%, and Repsol, with just over 6% at the end of the year. By June of 1989, the concentration process had already accelerated and the main shareholders were: Caja de Pensiones (23.64%), Repsol Group (8.54%), Asland Group (6.97%), AAC Grup (4.94%), Caja de Barcelona (4.47%) and SGAB (1.52%); in other words, six shareholders already controlled 50.1% of the company.

All these changes in shareholdings led to the resignation of four executive directors: Francesc Badia, Pere-A. Fàbregas, Josep Musté and Miquel Ribas, as well as the enlargement of the Board by two seats and the appointment of Isidro Fainé, Antoni Brufau and Agustí Montal representing the Caja de Pensiones; Ricardo Fornesa (SGAB), Joaquín Bertran de Caralt (Asland) and Juan Torres Picamal (Caja Barcelona). Finally, in September, British Gas, plc. started buying stock on a friendly basis. By December, Repsol already controlled 12%.

1989 ended with the news of a possible merger of Catalana de Gas and SGAB, an operation in which the teams of Catalana de Gas, SGAB, Caja de Pensiones and Lyonnaise des Eaux were working together. Water and gas in customer relations had clear synergies: pipes, commercial actions, customers, IT systems, etc., shareholders who understood each other: Caja de Pensiones and Lyonnaise, and a great interest from the chairman of SGAB at the time, Ricardo Fornesa. The gas business had great potential for growth, and the water business tended to stabilize, as has since become clear, but the French concept of utility companies saw clear advantages in managing them together. The two major French service companies, Générale des Eaux and Lyonnaise des Eaux, were the only world leaders in the joint management of gas and water. In any event, if the merger were to take place, the two main shareholders of the merged company would be the Caja de Pensiones and Lyonnaise, leaving Repsol and its possible ambitions in the background.

The change of year began with the purchase by British Gas of the shares of Catalana de Gas owned by Asland, a transaction carried out in January of 1990, which led to the resignation of the board member representing the latter company, while in February it was agreed that AAC Grup would be dissolved. All this was

caused by the purchase by the French cement company Lafarge Coppée of the controlling stock of Asland in June of 1989.

The first half of 1990 was full of movements in all directions, but intense work was done on the merger of Catalana de Gas and SGAB, with the approval and collaboration of its main shareholders, Caja de Pensiones and Lyonnaise des Eaux.

News of the possible water and gas merger in Barcelona led Repsol to accelerate its plans. Thus, in the same months, it reached an agreement with the important shareholders of Gas Madrid, that is, Banco Pastor (33%) and Hidroeléctrica Española (20%), to acquire their respective stakes, which, once executed, gave Repsol an 88% stake in the company and obviously control. This was implemented at a Board meeting held on June 4, 1990, at which practically all the members were replaced and a Repsol representative, Félix Ibáñez de Carlos, was appointed as the new executive chairman of the company, replacing Guillermo de la Dehesa, who represented Banco Pastor; simultaneously, a new organizational structure of the company was approved.

The pressure did not take long to come from the Ministry of Industry, whose head, Claudio Aranzadi, together with the chairman of Repsol, Oscar Fanjul, had different meetings with José Vilarasau, at the time managing director of the Caja de Pensiones para la Vejez y de Ahorros de Cataluña y Baleares. Their argument was simple: if Catalana de Gas merged with Aguas de Barcelona, it would have a foreign company (Lyonnaise) as a major shareholder, which it did not consider to be appropriate; on the other hand, a grouping of all the gas companies in Spain, with the exception of Sociedad del Gas de Euskadi, which was owned by the Basque government, made perfect strategic sense from the perspective of the interests of the Ministry of Industry and Repsol, thinking furthermore of the immediate privatization of Repsol.

As Vilarasau wrote: "Repsol and "la Caixa" had different pretensions and it was a very difficult and rough task to bring them closer together"⁴²³, but finally they reached an agreement that involved setting up a large gas company in Spain, integrating the main distribution assets existing in the country, namely Catalana de Gas, Gas Madrid and, what was later called the assets split off from Repsol Butano, which corresponded to the small distributors promoted by Butano in recent years.

At the General Shareholders' Meeting of Catalana de Gas, held on June 28, 1990, the main shareholders were: Caja de Pensiones (23.64%), Repsol Group

423. Vilarasau (2012), p. 565.

(14.27%), British Gas (9.98%), Caja Barcelona (7.00%) and SGAB (6.48%), i.e. five shareholders controlled 61% of the capital; the process of concentration continued.

In addition, the two savings banks were in the process of developing a merger, which had been pending only since March when the Minister of Economy and Finance, Carlos Solchaga, granted the appropriate tax exemptions to make it possible. They were told that the exemptions would be 125 billion pesetas, but were not formally informed of this. Vilarasau comments that they did not understand the delay and that when he insisted on this to the Ministry: “someone insinuated to me that the minister was causing the delay because “la Caixa” had not signed the protocol for the creation of Gas Natural”.⁴²⁴ In other words, either what Repsol and the Ministry wanted was formalized, or there were no tax exemptions for the merger of the savings banks.

The story ended with the signing of the memorandum of understanding concerning the gas company between Repsol and “la Caixa” on July 19, 1990; the following day the tax concessions were granted, and on July 27 the boards of directors of the two savings banks took up the merger resolutions.

The news of the agreement between Repsol and “la Caixa” was immediately made public and the corporate structures that were in place at the time were suggested, which would not be the ones that were definitively implemented; however, a matter published at that time would be definitive: the chairman of the new group would be Pere Duran.

In November of 1990, Repsol was appointed to the board of directors of Catalana de Gas, represented by Guzmán Solana, replacing Joaquim Maluquer.

At the end of 1990 the main shareholders were: “la Caixa” (30.45%), Repsol Group (13.74%), British Gas (9.98%) and SGAB (6.47%). Only four shareholders now controlled 61% of the company; of the nine members of the Board of Directors, only three were executives and the other six were proprietary shareholders, four representing “la Caixa”, one representing Repsol and one representing SGAB.

424. Vilarasau (2012), p. 566.

1991-2008

Gas Natural SDG:
The Big Change

The evolution of Catalana de Gas' shareholding since 1987, promoted by the interest in the growth and development of the gas sector in Spain, had led to the appearance of a large shareholder, "la Caixa", followed by Repsol; both were the protagonists of the sector's change of scale. In the case of "la Caixa", a powerful investment strategy had been designed in utilities — telecommunications, motorways, water, gas, etc. — and in this respect it had become a shareholder of Catalana de Gas, seeking complementary investments to those of the strict financial business and which could provide countercyclical elements.

The company Repsol was created in 1986 to centralize the conversion of public assets in the oil and gas sector — Empetrol, Hispanoil, Alcludia, Calatrava, Butano, etc. — with a view to the necessary adaptation after the entry into the European Economic Community. Only Enagás had been left out, although they shared the same shareholder base, the Instituto Nacional de Hidrocarburos (INH). Enagás had not joined Repsol as it was considered that, in its future IPO, it could jeopardize the operation due to its complicated financial situation.

The oil sector in Spain had always followed the strategy of trying to prevent the gas sector from growing, contrary to the actions of its European counterparts, which acted naturally in both sectors. Repsol began the rapprochement between the two, first by promoting new gas distributors from Enagás or Butano, and finally by acquiring the second largest distributor in Spain: Gas Madrid, S.A. to later undertake the operation with Catalana de Gas.

The Merger of Catalana de Gas and Gas Madrid

The Creation of Gas Natural SDG, S.A. (1991)

The strategy of Repsol and "la Caixa" coincided, although their perspectives were different, and this framed the agreement they reached to configure a new reality for the gas sector in Spain, from their respective investments in Catalana de Gas and Gas Madrid. The first approach was to bring all the shares together in a joint holding company. Finally and with great skill the operation was designed as a merger by absorption, in which Catalana de Gas would carry out the absorption of Gas Madrid and also of the small gas distributors that had been created in the Repsol/INH perimeter. At that time, Catalana de Gas was the most important gas distributor in Spain, while Gas Madrid was the second largest.

It was also agreed that the Board of Directors would be equal between Repsol and “la Caixa”; the latter would appoint the chairman, and Repsol, the CEO. In March of 1991, Pere Duran and Antonio Téllez were appointed to these positions, respectively. The first joint organization of the two companies was launched in June 1991, in preparation for the process. In those months British Gas and Aguas de Barcelona left the shareholding.

With this operation Pere Grau left the chairmanship, which he had held since 1984, and Pere Duran, the introducer of natural gas in Spain, returned in a climate of consensus between the two main shareholders (Table 54).

After a laborious preparation, the merger operation was carried out on December 31, 1991, creating a gas distribution company of a size never seen before in Spain, with 1,400,000 customers, one million of whom came from Catalana de Gas and the rest from Gas Madrid and the other small companies involved. The headquarters continued in the traditional building on Avenida del Portal de l'Àngel in Barcelona. Shareholders were 44 % owned by Repsol/INH (30 % by Repsol, 14 % by INH), 25 % by “la Caixa” and 31% by some 28,000 small shareholders. The proportions were as they were, but control of the company would be equal, a great success for the position of Pere Duran and “la Caixa”.

At the strategic level, governance would be equal, but at the management level efforts were soon made to try to incorporate many elements of the incipient culture of Repsol and Enagás, still state-controlled companies, basically in the areas

Table 54. Catalana de Gas. Board of Directors (March 1991)

Name	Position
Pere Duran Farell	Chairman
Antonio Téllez de Peralta	Member of the Board
José Manuel Basáñez Villaluenga	Member of the Board
Antoni Brufau Niubó	Member of the Board
Francisco Carballo Cotanda	Member of the Board
Isidro Fainé Casas	Member of the Board
Ricardo Fornesa Ribó	Member of the Board
Pere Grau Hoyos	Member of the Board
Repsol, S.A., (Guzmán Solana Gómez)	Member of the Board

Source: CNMV.CdG. Relevant fact. *Composición del Consejo de Administración (25-03-1991)*.

of planning and human resources. On the other hand, the former Catalana de Gas was able to maintain the same spirit in its operating activities, finances and IT systems. The integration of cultures was complex, there were people from Repsol and Enagás, but also from Catalana de Gas and Gas Madrid, who, although they were private companies, came from very different traditions. The language itself was confusing, what some called approving an investment, others called providing a budget appropriation.

The new company quickly began to operate; thus, it brought together business cultures and began an important growth plan in most of the autonomous communities of Spain. There was also an important emphasis on achieving synergies and improving the efficiency of existing processes and systems, with the aim of implementing the best available practices in the global perimeter.

In order to facilitate the deployment on Spain, the General Meeting of Shareholders, held in June 1992, decided to adapt its corporate name to the new reality, and changed its name from Catalana de Gas to Gas Natural SDG, S.A., the fourth change of name in some 150 years. Also, a modern symbol was approved that incorporated a multicolored butterfly, then a risky bet, but which over the years has demonstrated its personality and power in communication.

Gas Madrid and the Compañía Madrileña (1851-1991)

The first antecedent of the Gas Madrid company, integrated into Gas Natural SDG in 1991, can be found in the interest for gas initiated in Madrid in 1831, when the City Council called for a public lighting competition. Although practical results were not achieved until 1846, when the Englishmen Edward O. Manby and William Partington promoted the Sociedad Madrileña para el Alumbrado por Gas⁴²⁵ with the financial support of the Marquis of Salamanca's group — José de Salamanca, José Buschental, Gaspar de Remisa, Nazario Carraquiri, Luis María Pastor and Pedro Surra Rull — and a capital of 12 million *reales*.

Immediately the City Council ceded a piece of land and began the construction of a gasworks in the Puerta de Toledo area; tests were carried out on public lighting in 1847, on Calle del Prado y Lobo, and the first private lighting customers were recruited.

The company went through serious problems in 1848, due to the crisis on the Madrid stock exchange, and its promoters disappeared, both José de Salamanca,

425. Simón Palmer (1989), pp. 47-56; Fàbregas (2012d), pp. 46-47.

who had fled Spain, and the two English experts who had set it up. In this situation, management fell to the enlightened Melitón Martín de Bartolomé, who had to face the lack of coal and the consequences of the crisis that had left the company practically bankrupt. In September of 1848, the shareholders appointed Gregorio López de Mollinedo as their *esclusivo* director (sic) for a period of three years. The reorganization of the company and the expansion of the service began with the accelerated acquisition of new customers, which led to the signing of a new contract with the City Council in 1849. Finally, in 1851 the company was restructured, until the Compañía Madrileña para el Alumbrado por Gas was created with a capital of 17 million *reales* and under the control of López Mollinedo.

The appearance in 1856 of the Credit Companies Act marked the creation of Crédito Mobiliario Español, a subsidiary of the French Crédit Mobilier of the Pereire brothers, which acquired the Madrid gas company. The strategy of the Pereire family was to build the Compañía de Caminos de Hierro del Norte de España, which could have a base load transporting coal from its mines in Palencia to the main coal consumer of the time, a gasworks of the importance of the one in Madrid, thus closing a clear virtuous circle.

The next step was taken in 1865, when Crédito Mobilier Español sold the Madrid gas company to Crédit Mobilier in France. The new owner took a more ambitious approach and formed a new company, the Compañía Madrileña de Alumbrado y Calefacción por Gas, with a capital of 91.2 million *reales*, headquartered in Madrid and Paris, and an important Board, whose members included Laureano Figuerola.

Laureano Figuerola was a Catalan economist, then Finance Minister (1868-1870); he was responsible for the introduction of the peseta as a monetary unit in Spain in 1868. In 1865 he was appointed board member of the Compañía Madrileña de Alumbrado y Calefacción por Gas and appointed chairman in 1869, a position he held until his death in 1903.⁴²⁶ Once he finished his active political career, he was president of the Real Academia de Ciencias Morales y Políticas (Royal Academy of Moral and Political Sciences) (1898-1903). The expansion in Madrid was significant, and the geographical deployment was completed in 1880 with the purchase of the gasworks in Alicante⁴²⁷, Burgos, Cartagena, Jerez, Logroño, Pamplona and Valladolid from a Dutch company of the Stockman group.

Thermal electricity appeared in Madrid in 1889, when the Compañía General Madrileña de Electricidad was formed as a 50/50 joint venture between the

426. Martínez (2014), p. 5.

427. Fàbregas (2013c), pp. 46-47.

German AEG and the gas company, at the same time as the English company Electricity Supply was established in the capital. A new stage thus began; the problems began to appear in 1897, when the gas company bought the English electricity company to eliminate competition and merged it with the Compañía General Madrileña de Electricidad for a high price. The need to deal with the reform and modernization of its facilities rapidly deteriorated its financial position.

In the context of the end of the century, the Madrid gas company was an important company with more than 800 employees, which also dominated electricity in the capital and gas in other major cities. In 1903, Chairman Laureano Figuerola died and was replaced by the civil engineer Luis Canalejas y Méndez, brother of José Canalejas, who would become minister and president of the government. Luis Canalejas was also very active in politics; he was a deputy for Cuba in 1896 and for Girona (1898, 1901, 1903, 1905), as well as senator for Girona (1899-1900) and life senator (1905) until his death in 1910.

AEG withdrew from Madrid in 1905, after selling its 50% stake in Compañía General Madrileña to its other partner, the Madrid gas company. However, in 1908, when the first glimpses of hydropower began to appear, the financial situation of the company was already difficult because of its substantial financial burdens and high costs. In order to obtain hydraulic energy in good conditions, in 1912 the Compañía General, together with the Sociedad de Gasificación Industrial and the Salto de Bolarque, set up a new company called Unión Eléctrica Madrileña, which would eventually become the third largest electricity company in Spain, known as Unión Fenosa, and which would finally be incorporated into Gas Natural SDG in 2008. This last movement could not save the Compañía General Madrileña de Electricidad, which filed for bankruptcy in 1913.

World War I caused a serious coal crisis that damaged the Madrid gas company, which led to the municipalization of the company by the City Council in 1917, which accused it of not having a sufficient stock of coal and of not having started up new installations. However, in a few years the authorities forced the municipalization to be reversed; a new company was created in 1921, Gas Madrid, in which the former Compañía Madrileña de Alumbrado y Calefacción por Gas was listed as shareholders, together with the electricity companies that supplied the capital: Unión Eléctrica Madrileña, Hidroeléctrica Española, Cooperativa Electra Madrid, and Hidráulica de Santillana. Valentín Ruiz Senén was appointed chairman and held the post until his death in 1954. Ruiz Senén was the trusted man of the Urquijo Ussía brothers, a director of the Banco Urquijo and director of Unión Eléctrica Madrileña. In 1954 a new chairman was appointed, Germán de la Mora y Abarca,

then managing director of the Cooperativa Electra Madrid, married to a daughter of Antonio Maura and stepbrother of the Count of Gamazo. He was president until 1959. Gas Madrid had around 80,000 customers at that time. The change began in 1959 with the appointment of Pedro Barrié de la Maza as the new chairman, as a result of the Banco Pastor's entry into the company's shareholding structure.

The first experiments with petroleum derivatives were carried out in 1962 when a catalytic fuel oil cracking line was installed in the old gasworks, and culminated in the commissioning in 1967 of the new Manoteras gasworks⁴²⁸, with three lines of catalytic cracking of high pressure naphtha with a capacity of 600,000 m³/day, which were the first in Spain to use this technology. This led to the closure of the Ronda de Toledo gasworks the following year.

Pedro Barrié died in 1971 and was replaced by his wife Carmela Arias, Countess of Fenosa, who took over the chairmanship. These were years of increasing customer base, expanding networks and continuous growth in production capacity with new lines; in the mid-1980s, the number of customers exceeded 400,000. The next stage was that of natural gas, viewed with suspicion by the need to make significant investments, in a company controlled by a bank that was expecting dividends and an electricity company in the same area with no particular interest in the growth of gas activity. All of this led to an internal culture that overestimated technology and underestimated the market. However, the company extended manufactured gas pipelines from Madrid to surrounding towns such as Torrejón de Ardoz, San Fernando de Henares, Coslada, Pozuelo de Alarcón and Tres Cantos. In 1987, its networks reached 1,700 kilometers.

The definitive acceleration began with the signing of the 1985 Gas Protocol, which led to Butano's entry into the capital of Gas Madrid the following year with 25%. Natural gas finally reached Madrid in 1987 through the Enagás gas pipelines. The following year, Guillermo de la Dehesa was appointed chairman and CEO of the Banco Pastor, an entity that sold its shares to Repsol in 1990, a move followed by the other relevant shareholder, Hidroeléctrica Española, and control of the company changed to Repsol. Gas Madrid would be integrated into the new Gas Natural SDG at the end of 1991.

The general managers of Gas Madrid during its long 70-year history were Vicente Gómez Muñoz (1921-1946), Luis de Domingo Villanueva and Domingo García

428. Gas Natural SDG (1996), pp. 41-47.

Lorenzo (1946-1958), José Valdés López (1958-1972), Cristóbal Fernández Prieto (1972-1975) and José María Sáez García (1975-1990).

The Catalana de Gas Foundation (1992)

The current Naturgy Foundation was created in 1992 as the Catalana de Gas Foundation in the context of the creation of Gas Natural SDG. The orientation of the new institution was initially marked by the experience developed by Pere Duran as chairman of the General Shareholders' Meeting, and by the work of its Advisory Committee, which, as indicated above, had begun to connect with the company's environments and stakeholders in previous years.

The Catalana de Gas Foundation was established under the name of Catalana de Gas to maintain this historic name, although, due to the political balance, its headquarters are in Madrid.⁴²⁹ According to Pere Duran, the foundation was designed to: "promote the best possible integration and understanding between the company and our environment, to facilitate, enrich and optimize our industrial and social management".

In addition to the relationship with the surroundings and settings, the foundation was also designed to help integrate the very different cultures of the companies and people involved in the merger process that led to the emergence of Gas Natural SDG. Smoothing relations, improving mutual understanding and providing management tools were some of the objectives and work of the institution in this period. Mixing public and private, bringing together executives used to fighting for markets with those who were not, were difficulties, but also challenges that the contribution of the foundation helped to overcome, with concepts such as responsible freedom, sensitivity, etc.

According to the statutes, a brief summary of the foundational objectives and fields of action included: the cultural sphere, referring to the manifestations of the gas sector, its history, its social impact, etc.; the human and sociological sphere, with the themes of the integration of man in the company and of this with civil society; also the environmental sphere, mainly in terms of atmospheric pollution, and finally the scientific and technological sphere, in activities related to gas activity. With these objectives and an important Board of Trustees — with politicians, intellectuals, artists, military designers, scientists, etc. — the foundation began its journey. Joan Rigol Roig was appointed first Managing Director (Table 55).

429. Founding agreement of the Catalana de Gas Foundation. NFHA.GN.SDG. *Consejo de Administración* (16-07-1992).

Table 55. Catalana de Gas Foundation. Board of Trustees (1992)

Name	Position
Pere Duran Farell <i>Chairman of Gas Natural SDG</i>	Chairman
Óscar Fanjul Martín <i>Chairman of Repsol</i>	Co-Chairman
Juan Antonio Samaranch Torelló <i>Chairman of "la Caixa"</i>	Co-Chairman
Antonio Téllez de Peralta <i>CEO of Gas Natural SDG</i>	Vice-President
Joaquín Almunia Amann	Trustee
Enrique Barón Crespo	Trustee
Leopoldo Calvo Sotelo	Trustee
Josep Carreras Coll	Trustee
Ricardo Díaz Hochleitner	Trustee
Carles-A. Gasòliba Böhm	Trustee
Manuel Gutiérrez Mellado	Trustee
José Lladó Fernández-Urrutia	Trustee
Federico Mayor Zaragoza	Trustee
Marcelino Oreja Aguirre	Trustee
Joan Oró Florensa	Trustee
Gregorio Peces-Barba	Trustee
Marta Pessarrodona Artigues	Trustee
André Ricard	Trustee
Gastón Thorn	Trustee
Josep M. Vilaseca Marcet	Trustee
Francisco Carballo Cotanda	Secretary

Source: NFHA.GN.SDG. *Consejo de Administración* (16-07-1992).

Over time, the foundation expanded its activities, following the company in its internationalization process, with programs such as the cholera prevention program developed on the Argentine-Bolivian border, or the UNESCO Chairs in the universities of the Maghreb. It also engaged in conceptual reflection processes on utilities, the gas industry and civil society, among many other examples.

In 2000, the institution reoriented its activities to environmental issues, reduced its international activities and changed its name to Gas Natural Foundation. Subsequently, beginning in 2004 and coinciding with the appointment of Pere-A. Fàbregas as general director, it expanded its activities significantly; it carried out environmental, international and training activities, and set in motion an important cultural initiative, with the consolidation of the historical archive of Catalana de Gas/Gas Natural⁴³⁰, and finally with the construction and start-up of the Museo del Gas, inaugurated in Sabadell in December of 2011.

In recent years, 2013-2018, under the direction of Martí Solà, the foundation has continued with its informative activity in energy and environment, has created the first export program in Spain (2014), and has expanded international activities with the inclusion of Chile and other countries, and has strongly initiated a line of emphasis on the dissemination and support in the important issue of energy vulnerability with different agreements with entities and programs of action, training and volunteer work. The Naturgy Foundation has added to the Museo del Gas the museums from Unión Fenosa: the Museo de Bolarque, created in 1977 and incorporated in 2016, and the Museo de Arte Contemporáneo in A Coruña, inaugurated in 1995 and incorporated in 2017.

Since its creation, the Fundación has facilitated the relationship between the company and its environment, with greater emphasis on energy, environment, culture and social action in recent years, with a special vocation for service to society. The Naturgy Foundation is highly committed to the transparency of its information and activities and has therefore been considered by the Fundación Compromiso y Transparencia, since 2011 and for years, to be one of the most transparent business foundations in Spain; in 2018 it was ranked second.⁴³¹

The Barcelona Olympic Games (1992)

Barcelona, the city that had always been home to the headquarters of Catalana de Gas, by then known as Gas Natural SDG, celebrated the great moment of the Olympic Games in 1992 in a clear context of collective enthusiasm and change towards the future. From very early on, the company was involved in the project, from the transfer of the land of its former gasworks agreed in 1986, to the

430. Fàbregas and Bragulat (2005), pp. 1-9; Fàbregas (2011d), pp. 46-47.

431. GNF. Press Release. *La Gas Natural Foundation Fenosa es la segunda fundación de empresa más transparente, según el informe Construir Confianza 2017 (02-03-2018).*

realization of Olympic facilities in some of these grounds and allowing Barcelona to open up to the sea.

The collaboration with the Olympic Games in Barcelona, apart from land and sponsorship, also included the elements of the scenery in which gas was used in its operation, such as the Olympic torch and the fountain of the Montjuïc stadium.

The novel Olympic torch was created by André Ricard, a master of industrial design, but the burner and the design of its operation was the work of the technicians of Catalana de Gas/Gas Natural SDG. Ricard explained: "One day, in the technical office of Catalana de Gas, I was able to see a flame rise up which had the shape I had imagined and which corresponded to the one I had originally drawn".⁴³²

Also the Olympic cauldron, designed by Pep Sant and Ramon Bigas, functioned with the collaboration of natural gas. The idea had been conceived of lighting the cauldron at the opening ceremony of the games with a lit arrow passing over the installation. There could be no margin of error, and here again the technicians of Gas Natural SDG appeared, designing some burners that safely emitted a gas jet sufficient for the arrow to ignite under any circumstance, as the music of Angelo Badalamenti was playing for the inauguration ceremony, on July 25, 1992. It was a spectacular success.

The reconversion of the land involved the installation of the Olympic Village and the Olympic Port in the former gasworks of El Arenal, while the land of the Barceloneta gasworks, in accordance with municipal projects, would be converted into a park that would one day connect the Ciutadella with the sea through a green area. The new park was designed by the municipal architects Jordi Henrich Monràs and Olga Tarrassó Climent, and covered an area of 56,000 square meters. It contained the Torre del Agua and the gasworks' office building, both by Domènech Estapà, and the metal structure of one of the gasometers as a reminder of its former industrial activity. Different delays and priorities meant that the park could not be inaugurated until 1996, although the football field located in its interior opened in 1994.

With the transfer of land from the former Barceloneta gasworks, the City Council received the old office and management building, designed by Domènech Estapà and currently located at Paseo de Salvat-Papasseit, 1, on the corner of Calle Ginebra. Initially it was ceded temporarily by the City Council to the association

432. Ricard (1992), pp. 1-6.

Futuro Sostenible, which occupied it for a few years, and where it carried out various tasks related to the installation of renewable energies. Finally, in 2008, the Barcelona City Council presented the *Fábrica del Sol* (Sun Factory) project for the building, consisting of a program to convert it into an environmental education center to promote sustainability, linked to the objectives of Barcelona's Agenda 21; to this end, an educational facility was created for knowledge and experimentation in the field of energy sustainability.

The First 150 Years of the Company (1993)

In 1993 the company reached its first 150 years of existence. As described above, the company was founded in 1843 as the *Sociedad Catalana para el Alumbrado por Gas*, to light the city of Barcelona with gas produced from coal. The years of work and performance and the constant effort of the company's managers and its teams, together with the rest of its stakeholders, had made it possible to thrive after a century and a half of existence, and furthermore to be in a position to launch a new large-scale project, that of Gas Natural SDG. In short, a company of great tradition, but also of great modernity, one of the leading companies in the gas market.

The occasion was important, the company had not been able to celebrate its first one hundred years (1943) due to the harsh post-war situation, whereas at the 125-year mark (1968) the economic situation was difficult after many years of high inflation without reflection in the price rates and with the great investment effort to switch from coal to naphtha and later to natural gas.

The situation in 1993 was very different; the merger of *Catalana de Gas* and *Gas Madrid* had been successfully completed to create a large company, and a new path had begun: one of internationalization with great prospects.

In addition, during the commemorative ceremony held on September 23, 1993 in the *Salón Oval* of the *Museo Nacional de Arte de Cataluña* (MNAC) in Barcelona, with the presence of the monarchs of Spain, Chairman Pere Duran announced that in recent days it had been agreed that Gas Natural would acquire control of the leading state company in the sector, Enagás, thus closing a virtuous circle that had lasted for many years.

Duran stressed in the act the dimension of the company's historical protagonism with the following words: "I think, Your Majesties, as I have tried to underline in the course of my words, that the most characteristic existential trait of the life of our company, as a historical figure of Catalan civil society, is that it has never

ignored or abdicated its roots, which are firmly embedded in the social environment in which it has lived in authentic symbiosis since its very constitution. A symbiosis that has allowed it to strengthen its own identity with the constant reception of the immense wealth of nuances and sensibilities that only civil society can and knows how to transmit and which believes our company has been able to grasp and accumulate, turning it into a powerful intangible asset of its own that truly makes it unique as a historical figure".⁴³³

Internationalization: Argentina, Brazil, Colombia and Mexico

The gas industry in Spain had always been domestic, i.e. oriented towards the production and subsequent distribution of gas in Spain, with a lower than normal operating density in Europe. However, the emergence of a large company like Gas Natural SDG, with the appropriate financial muscle, made it possible to overcome these limitations and begin to open up internationally in the context of a progressive globalization.

The Beginning: Argentina (1992)

The opportunity arose when the government of the Republic of Argentina decided to privatize, through an international tender, the company Gas del Estado, one of the most important gas companies in the world.⁴³⁴ At the end of 1992, Gas del Estado was put on the market in ten lots, two transportation companies and eight distribution companies. Gas Natural SDG obtained approximately half of the Buenos Aires area, which gave rise to the company known as Gas Natural BAN — Gas Natural Buenos Aires Norte —, with almost one million customers and clear growth possibilities.

The experience was a great challenge for Gas Natural SDG, which, almost without having finished integrating gas into Spain — where it had 1.5 million customers —, began a new line of action, the internationalization of its activities with the acquisition in Argentina of practically one million customers. However, these were the paths of the future. Almost everything had to be learned in a very short time,

433. Duran Farell (1993), pp. 15-16; Fàbregas (2014b), pp. 210-212. On the occasion of the event, my biography of José Roura Estrada, the first person to carry out experiments with gas from lighting in Spain in 1826, was published, see Fàbregas (1993).

434. For a history of gas in Argentina, see Transportadora de Gas del Sur (1998).

but the value of the organization increased: expatriation, international finance, relations with local governments, etc.

In 2013, the group's activity in Argentina had 1,556,000 supply points, with a network of 24,033 kilometers and sales of 73,164 GWh of gas for residential, commercial and industrial use, with a significant presence in the important Argentine market of natural gas for vehicles, the largest in the world.

Investment in Brazil (1997)

In July 1997, in an incredible five-week period, Gas Natural SDG began its activities in Brazil, Colombia and Mexico. In Brazil, the company was the winner of the international tender for the distribution of gas in Rio de Janeiro, winning control of the companies CEG (Companhia Estadual de Gás) and CEG RIO, with 54.2% and 59.6% of the shares, respectively.

CEG was the former gas lighting company of Rio, founded in 1854, which had been in the hands of Brazilian, English and Belgian shareholders, both public and private. It supplies the populous city of Rio and is the most important gas distributor in Brazil.⁴³⁵ CEG RIO was founded in January of 1997 by the state of Rio de Janeiro and Petrobras to distribute piped gas to 65 municipalities in the state. In 2013 it distributed to 29 cities, such as Petrópolis, Tres Ríos, Cabo Frio, etc.

In the year 2000, the concession was obtained to carry out the distribution in the southern part of the state of São Paulo, an area of 53,000 square kilometers with significant industrial activity. For its development, the company Gas Natural SPS was created, 100% controlled, which supplied 35,000 consumption points.

In 2013, the group's activity in Brazil had 899,000 supply points, with a network of 6,476 kilometers and sales of 88,961 GWh of gas for residential, commercial and industrial uses, as well as for vehicles, with a high proportion of consumption by Brazil's formidable industry.

Entry into Colombia (1997)

Also in 1997, and through an international tender, Gas Natural SDG began its activities in Colombia through the award of the Colombian company Gas Natural ESP, which had been constituted in 1987 by Ecopetrol to introduce natural gas in Bogota. In 2014, gas was distributed in the municipalities of Bogotá and Soacha directly, and other areas of the country were reached through its

435. For a history of gas in Rio de Janeiro, see Dunlop (1949), Azevedo (1971) y Melo (2005).

subsidiaries: Gasoriente ESP, Gases de Barrancabermeja ESP and Gas Natural Cundiboyacense ESP, acquired in 1998. The growth of gas activities in Colombia was spectacular, due to the accelerated process of urbanization of Bogota and its surroundings.

Also in Colombia, as a result of the merger with Unión Fenosa in 2009, Electricaribe, S.A., ESP, which distributed electricity in the Caribbean coastal area, was acquired. The company was incorporated in 1998 by Houston Industries and Electricidad de Caracas with 65% and other shareholders with the remaining 35%, to try to overcome the electricity supply crisis in Colombia in previous years; it was finally acquired by Unión Fenosa in 2000. Electricaribe absorbed the company Electrocosta in December 2007.

In 2013, the group's activity in Colombia, in the gas sector, had 2,518,000 supply points, with a network of 20,293 kilometers and sales of 18,736 GWh of gas for residential, commercial and industrial use, as well as for vehicles. The electricity sector had 2,396,000 supply points and sales of 11,929 GWh. The almost 5 million homes in Colombia supplied with energy supply by Gas Natural Fenosa clearly showed the importance and size of the company in the country at that time.

Mexico, a Market with a Future (1997)

Naturgy began its activities in Mexico in 1997 when it obtained the permits for the distribution of gas in Toluca. The same year it acquired Repsol's distributors in Saltillo and Nuevo Laredo. Subsequently, in 1998, it was awarded the Monterrey area in an international bidding process and, finally, in 2000, it obtained the permits for the Bajío Sur area and acquired the Mexico City distribution company, with significant development possibilities. A broad presence in a country with economic growth and clear possibilities for the future.

In 2013, the group's activity in the gas sector in Mexico had 1,348,000 supply points, with a network of 18,252 kilometers and sales of 48,972 GWh; it supplied gas for residential, commercial and industrial use, and also for vehicles.

In the electricity sector, the activity began with the purchase of five combined cycle power plants from EDF and Mitsubishi in 2007 for 1,448 million dollars, which represented an installed power of 2,233 MW, making the company the second largest private operator in the country. The subsequent integration with Unión Fenosa (which had been very active in the installation of combined cycle plants in the country) led to the sale, in 2010, of the plants prior to the consortium formed by Mitsui and Tokyo Gas.

In 2013, there were some 2,000 MW of installed capacity at the Hermosillo (2001, 270 MW), Naco Nogales (2003, 300 MW), Tuxpan III and IV (2004, 1,000 MW) and Norte Durango (2010, 450 MW) plants, all from Unión Fenosa.

In 2013, Gas Natural Fenosa was the main private company in the energy sector in Mexico; it operated in the Federal District and in the states of Aguascalientes, Coahuila, Durango, Estado de México, Guanajuato, Nuevo León, San Luis de Potosí, Sonora, Tamaulipas and Veracruz.

The Privatization of Enagás and the Maghreb-Europe Gas Pipeline

By the early 1990s the time had come to connect Spain and Algeria by gas pipeline, which would be called the Maghreb-Europe gas pipeline. Enagás was to take on the construction of the Moroccan and Spanish sections of the infrastructure, which entailed an additional financial effort, as well as assuming the construction risk, which was very significant, given the internal situation in Algeria at the time and Algeria's relations with Morocco; on the whole a truly complex framework was presented.

On the other hand, the government headed by Felipe González wanted to initiate the development of a policy of privatization of the public companies constituted during the years of the previous regime to improve the financial situation of the state itself, and decided to start with Enagás. This was difficult because in 1993 it had accumulated losses of 120 million euros and it was known that it had not been able to join the Repsol perimeter in its privatization due to its financial image.

All this led to the idea that Gas Natural SDG could acquire the company. Although there had previously been some attempts by Repsol to merge Enagás and Gas Natural SDG, an operation that would have led to a clear majority of Repsol over "la Caixa" in the entire perimeter, it was finally decided that Gas Natural SDG would acquire 91% of Enagás' capital and that an equal board would remain for the company, but with an additional board member for INH, which would allow a majority for the Repsol-INH group.

The valuation of the company by independent experts showed a clearly negative value, due to the risk of the Maghreb gas pipeline. In order to achieve a positive value it was decided to separate the pipeline project into a company called SAGANE, in which the capital would be distributed 91% INH and 9% Enagás, and it was planned to return the project to Enagás' balance sheet once the pipeline

was put into operation and the Algerian situation was clarified. In short, for 91% of Enagás, Gas Natural SDG paid 51,233 million pesetas in 1994.

This was followed by a broad process of achieving synergies between Enagás and Gas Natural SDG; Pere Duran was appointed chairman of Enagás, while the previous chairman of Enagás, Juan Badosa, became the new CEO of Gas Natural SDG and Enagás, replacing Antonio Téllez on September 23, 1993, after the acquisition had already been decided. Parallel organizations were reduced in many areas, and great emphasis was placed on growth and gasification in Spain. Enagás, which had been a state company until then, had to advance in multiple concepts to prepare for the future. Subsequently, after the 1996 elections in which the Partido Popular (Popular Party) won with José María Aznar, the remaining 9% of the shares were acquired from SEPI in October of 1998, by which Gas Natural SDG finally possessed the entire capital.

With this acquisition, the regasification plant in the port of Barcelona was once again part of the group that had built it in the years 1965-1969, the then Catalana de Gas, known since 1992 as Gas Natural SDG, a company at both times headed by Pere Duran Farell, as it was in 1994. The forced sale to the state in 1975 had been reversed over time, after 19 long years.

But apart from the moral satisfaction, the situation would not have great continuity. The beginning of the liberalization of the sector in 1998, culminating in the Royal Decree of June 23, 2000, entailed the legal obligation to re-separate the transmission networks and the function of Technical System Manager of the distribution and marketing networks. Gas Natural SDG proposed a 65% IPO of Enagás in June 2002. In the following years, the divestment program continued until by 2006 Gas Natural SDG's stake in Enagás was only 5%, and was subsequently reduced to zero at the end of the process in 2009.

The Enagás listed on the stock exchange in 2002 had little to do with the Enagás that launched the Maghreb-Europe gas pipeline in 1994. The pipeline had been completed and in operation since 1996. Meanwhile, a significant investment and commercial effort had been made, likewise in terms of organization and systems, which had created a company with radically different expectations, and which was also profitable, which in 2002 amounted to profits of 110 million euros. The work of Gas Natural SDG at Enagás meant that in nine years the company's fixed assets doubled, the networks in operation tripled and sales increased by three and a half times. A big change, it was almost another company (Table 56).

Table 56. Enagás. Basic data (1993 and 2002)

	1993	2002
Net fixed assets (millions €)	1.022	2.360
Networks (km)	2.661	6.390
Sales (bcm)	6,5	22,1

Source: ENAGÁS, Reports 1993 and 2002.

As for the construction of the Maghreb-Europe pipeline, it was the culmination of the studies that began in the 1950s with the Eurofrigaz project of the ASSEMI, as explained above. Also, from the beginning of the creation of Enagás, the possibility of a gas pipeline from Algeria to Spain had been studied, with the SEGAMO company and the oceanographic campaigns of Yves Cousteau, thinking of a direct Algeria-Almería pipeline. But the possibilities of the technology available at the time and the large investment required had not made it possible. However, in the early 1990s, the possibility of building the gas pipeline through Morocco appeared, and as a European project, as it introduced not only Spain's interests but also those of Portugal into the approach.

The project included an Algerian section, from Hassi R'Mel to the Algerian-Moroccan border (530 km), built by Sonatrach; a Moroccan and maritime section, from the Algerian-Moroccan border to the Spanish coast (525 km), built by a consortium led by Enagás, at an approximate cost of 110,000 million pesetas; a Spanish section, from the Spanish coast to the connection to the Red Nacional de Gasoductos (National Gas Pipeline Network) in Córdoba and then to the Portuguese border, which was Enagás' basic responsibility, and finally, a Portuguese section, from the Spanish-Portuguese border in Extremadura to Galicia, which was the basic responsibility of the Portuguese company TRANSGAS. On May 13, 1993, work began on the Algerian-Moroccan border at Ain Beni Mathar. A project that was set up with a complex legal and financial structure, the core of which was the Europe Maghreb Pipeline Limited (EMPL) company.

With the whole process underway and shortly before its inauguration, on July 24, 1996, the CEO of Gas Natural SDG and Enagás, Juan Badosa, was appointed chairman of Repsol Butano; he was replaced by Guzmán Solana, vice-president of Repsol at the time of Oscar Fanjul. The inauguration of the gas pipeline was carried out in Córdoba on December 9, 1996 by Pere Duran and the monarchs of Spain. The Maghreb-Europe pipeline provided an important southern connection

of the Spanish gas system, and one by pipeline, complementing the regasification plants and a small gas pipeline connection with Norway in the north.

In addition, the Maghreb-Europe made it possible to bring the interests of Algeria, Morocco, Spain and Portugal closer together, with positive connotations for the future, and provided the possibility of breaking the traditional lack of connection between the autonomous community of Galicia and the supply of natural gas. With this pipeline, Gas Natural SDG started its activity in the field of international gas transport and began activities in a new country: Morocco. The importance of the gas pipeline, and the fact that it was clearly a Spanish initiative, was recognized by the Algerian authorities, who after the death of Pere Duran in 1999 decided to name the Algerian section, the Pere Duran Farell Gas Pipeline.

In its first twenty years of operation (1996-2016), the Maghreb-Europe transported 182 bcm of natural gas, of which 74 % was destined for Spain.⁴³⁶

Chairman Antoni Brufau

European policies, which sought to create a single energy market, with an important discourse regarding the liberalization of activities in the traditional sector in which gas and electricity companies operated, marked a new stage in the company's development, but also a reorientation of its strategy to adapt to the new framework, coinciding with a change of chairman.

In 1997, after the first five years of operation of the new Gas Natural SDG, "la Caixa", the shareholder that had appointed him decided to replace Pere Duran, due to the progressive difficulty of his relations with the chairman of Repsol, Alfonso Cortina, as Josep Vilarasau explained in his memoirs.⁴³⁷ Duran defended the interests of Gas Natural SDG, and Cortina those of Repsol's, and these were not always the same. Alfonso Cortina had been appointed chairman of Repsol to replace Óscar Fanjul after the PP's victory in the 1996 elections. Pere Duran's departure was a great change; in the context there may have been, according to what was commented at the time, some major political operation.

Chairman Pere Duran Farell left the front line; the man who had made it possible for a natural gas sector to exist in Spain was retiring after countless years of

436. GNF. Press release. *20 aniversario del gasoducto Magreb-Europa* (12-12-2016).

437. Vilarasau (2012), pp. 569-572.

service, and after having managed to integrate the business and human structures of Catalana de Gas and Gas Madrid into the new Gas Natural project. He was appointed honorary chairman of Gas Natural SDG by the Board of Directors and continued as chairman of the foundation, then still known as the Catalana de Gas Foundation, and carried out many activities until his death in 1999. In his memory, as mentioned above, Algeria named the Algerian section of the Maghreb-Europe gas pipeline Pere Duran, while the city of Barcelona dedicated a street in his memory, next to the Palacio de Pedralbes.

Antoni Brufau, who had already been on the Board of Directors for a number of years and who at the time was a senior board member of “la Caixa”, one of the company’s two main shareholders, was appointed to replace him.

When Antoni Brufau took over the chairmanship in 1997, Guzmán Solana remained as CEO, who would continue to be so until July 29, 1999, when he was appointed executive vice-president for natural gas and electricity at Repsol. He was replaced by José Luis López de Silanes, who came from Repsol-CAMPSA and was already a senior executive at Gas Natural SDG.

Antoni Brufau Niubó was born in Mollerussa (Lleida) and had a degree in Economics from the Universidad de Barcelona. He started his professional activity at Arthur Andersen, where he was responsible for the Barcelona office and was a partner and director of Auditing. In 1988, he joined “la Caixa” as deputy general manager, and later became managing director of “la Caixa” Group, and the main builder of the company’s group of industrial subsidiaries, including Gas Natural SDG. In 1997, he was appointed chairman of Gas Natural SDG, a position he held until 2004, when he was named chairman of Repsol, replacing Alfonso Cortina, and likewise vice-president of Gas Natural SDG, representing that shareholder.

The period of Antoni Brufau’s chairmanship (1997-2004) was not easy and during it the company had to face great challenges: the establishment of homogeneous criteria among the main shareholders, navigate the paths of the announced liberalization of the sector, the convergence of gas and electricity, the construction of the future, the entry into new sectors of activity, in short, a new stage in history with all its greatness and complexities.

The Liberalization of the Gas Sector in Spain

The disappearance of state monopolies in the oil sector and the liberalization of activities for both oil and gas led to an important law, the 1998 Hydrocarbons

Law.⁴³⁸ With this law, the process of liberalization of the gas sector in Spain truly began, regulating the separation of marketing and distribution activities, i.e. that the ownership of a given pipeline or channeling would no longer give the right to sell gas to customers, but that the right to sell would be given to any marketer if it paid a fee for the use of the pipeline. It also created the Comisión Nacional de la Energía (National Energy Commission). The process was of great importance and magnitude, and was in part forced by the different EU directives on the subject, which Spain decided to apply before many other European countries.

In the explanatory memorandum, the law itself explained its orientation and scope, stating that: "The purpose of this law is to renew, integrate and standardize the different legal regulations in force in relation to hydrocarbons. The aim is therefore to achieve more open regulation, in which the public authorities safeguard the general interest through the rules themselves, limiting their direct intervention in the markets to when there are emergency situations. This regulation must also allow free entrepreneurship to expand its scope of action and the introduction into our legal system of technical and commercial realities that have been socially assumed, but lack, at the moment, the appropriate legal framework. In addition, in parallel with this opening up of legislation, the mechanisms for detailed information by market agents to the competent authorities must be further developed, so that the achievement or not of the objectives proposed by the liberalization of the markets can be ascertained".

The new law abolished the consideration of the gas sector as a public service and the system of administrative concessions. It also made progress in liberalizing the sector by separating the functions of transport, distribution and marketing, and recognizing the consumer's right to freely change supplier.

The new figure of the technical system operator to ensure the operation of the core and secondary transmission networks also appeared. Unbundling was established, the separation of activities between distribution and marketing, distributors would only manage supply points, while the commercializing companies would only manage customers.

It was a law of great importance and with very important consequences. The liberalization of the gas industry in the following years occurred very quickly, much faster than its equivalent in the electricity market. In four years the liberalized market already accounted for 70% of the total, and the process was fully completed

438. Ley 34/1998 de 7 de octubre del Sector de Hidrocarburos (BOE, October 8, 1998).

in ten years (2009), although the “last resort rate” was created for small domestic customers who did not want to join the changeover. In 2009, and as a result of this process, there were thirty-two registered gas trading companies in Spain, of which twenty were currently active. A big change.

New Activities and New Instruments

Expansion of Activities: Transport, Fleet, Trading, Upstream (1994-2004)

As a result of the internationalization of gas activities and the process of liberalization of gas in Spain, Gas Natural SDG gradually entered new sectors of activity and new developments in these years in order to complete its profile as an important company in the international context, and also to improve the mix of risks between different countries and different businesses, with the right balance between regulated activities, that is to say, activities subject to the risk of a regulator, and non-regulated activities.

The initiatives had already begun in 1994. Through the acquisition of control of Enagás, Enagás had entered the gas transport business, which would be expanded in 1996 with the Maghreb-Europe gas pipeline, which introduced Gas Natural SDG into international gas transport by also carrying out this activity in Morocco and Portugal.

In 1999, gas trading began⁴³⁹, seeking to generate business through the joint optimization of the varying availability of gas, fleet and international activity, which over the years consolidated itself as one of the key activities in the generation of profits of Gas Natural SDG, later Naturgy. Also, gas and electricity commercialization activities started in 2000, a new subject required by the liberalization implemented in these sectors.

It is also worth mentioning the investment in combined cycle plants in Spain, the technology that brought the gas and electricity sectors closer together and which in Spain began its activity in 2002. Likewise, the approach to upstream⁴⁴⁰ with the development of activities in gas exploration and production in Algeria and Angola (2004). And the start of activities in mature renewable energies,

439. Trading refers to international trade in liquefied natural gas between wholesale market operators.

440. Upstream are the operations related to the prospecting, research and production of natural gas from its fields of origin.

beginning operations of electricity production using wind energy, in the corresponding wind farms (2004).

Finally, the rapprochement between Repsol and Gas Natural SDG in the areas of trading and methane tanker fleet led to the constitution of the company Repsol Gas Natural LNG 50/50, to operate in the supply, transport, trading and wholesale marketing of liquefied natural gas. This company operated with a significant development of its activities until the sale of the natural gas business by Repsol to Shell at the end of 2013.

New Instruments: Finance, Internet, CSR (1998-2004)

The increase in the size of the gas sector in Spain, with the company's important position, in addition to its progressive internationalization, and taking into account the opening of new lines of action, called for an extensive process of developing instruments and support elements for basic business activities.

The course of things in the last few years had changed the company. In a span of only 15 years, the Gas Protocol (1985) had been implemented, with all its potential for dynamizing the country's markets; the creation of Gas Natural SDG (1991) had been completed, and the process of internationalization (1992) had begun, which in the immediate following years led to starting up new activities and an expansion to new countries.

The consequence of all these movements could be seen in 1998, when the increase in the company's stock market value showed a significant growth of 95%, and situated Gas Natural SDG as the second largest gas company in Europe according to its stock market capitalization. In addition, an English study of the main gas companies in the sector designated Gas Natural SDG as the most dynamic gas company in the world. The level had changed. In a context closer to home, in 2005 Gas Natural SDG was the tenth largest company in Spain by market capitalization and the largest in Catalonia.

As a result of this greater and better positioning, the company set up a program to finance itself naturally on international markets in accordance with its status; in 1998 work began on obtaining a rating, an external qualification, for its debt issues. The process culminated in February of 1999 with clearly positive ratings from both Standard & Poor's at AA-, and Moody's at A1, both with stable outlook.

Based on obtaining the rating, on October 29, 1999 Gas Natural SDG undertook the implementation of a framework program for the issuance of bonds in the European market, Euro Medium Term Notes (EMTN), with a public or private format and variable terms, for an amount of one billion euros, with securities listed on

the London Stock Exchange. The benchmark issue, to achieve the benchmark for bonds in the market, was 500 million euros in 1999, and was well received in the markets. The program, with the necessary adjustments and updates, is still active in 2018, and makes the placement of bonds possible in the always competitive international financial markets.⁴⁴¹

Modernization processes also took place in other areas, such as the opening up of the company to new Internet concepts, with a corporate e-Business management, which in the period 2000-2004 introduced this new channel in the relationship with customers, as well as with suppliers and installers, and the group's intranet, NaturalNet, was set up for employees. These activities received various awards and recognitions from Spanish society for the way they were carried out and the moment they were launched, and clearly improved the group's operational interaction with its surroundings.

Another important aspect was the progressive emergence of the concepts of corporate social responsibility (CSR), and the growing demand from markets and society for companies to enrich their activities, overcoming their drive for economic benefit alone through a broader concept of relations with society in general and with different stakeholders specifically. Gas Natural SDG has been active in these areas since the early years of the 21st century, always in a leading position.

In 2001, Gas Natural SDG was included in the selective FTSE4Good index created to objectively measure the performance of companies that comply with globally recognized corporate responsibility standards, thus facilitating investment in them. The following year, the Global Reporting Initiative, whose aim was for companies to publish a sustainability report with the economic, environmental and social impacts of their activities, gave maximum recognition to the Corporate Responsibility Report of Gas Natural SDG. In 2004, the Dow Jones Sustainability Index (DJSI) incorporated the company into its composition.

Combined Cycle Plants

One of the reasons for the great growth in the consumption of natural gas in the world in the last years of the 20th century and the beginning of the 21st century

441. In November 2017, the EMTN program after several updates, was renewed up to a limit of 15 billion euros, was listed on the Luxembourg Stock Exchange, and used as issuing vehicles: Gas Natural Capital Markets, S.A., and Gas Natural Fenosa Finance BV. FENOSA NATURAL GAS (2017): Wholesale Base Prospectus euro 15,000,000,000,000 Euro Medium Term Note Programme, 30 November 2017.

was the large-scale introduction of combined cycles, a new technology for generating electricity using natural gas as a raw material, which made it possible to reduce the investments required, reduce construction times and improve the performance of the plants, while also achieving significant savings in the energy consumed in the production process, and through a process that was clearly more respectful to the environment.

One of the main advantages of a combined cycle was its efficiency in the process of converting energy to produce electricity, reaching yields of 57%, whereas in a conventional cycle it was only 36%. To produce 100 units of electricity, one cycle required 37% less primary energy, thus avoiding unnecessary consumption of energy as a raw material.

At the environmental level, natural gas combined cycle technology was able to reduce both greenhouse gas emissions (with emissions of approximately 60% less CO₂) and emissions responsible for local pollution phenomena (with reductions of 70% in nitrogen oxide emissions, virtually eliminating sulfur and particle emissions). These plants were also more efficient in the use of cooling water as they required smaller quantities.

Another of the technology's advantages was the flexibility of its operation at different load rates, and the ease of starting and stopping, which allowed its use in coordination with other generation mechanisms, adapting to the ever-changing demand for electricity.

In Spain, since the situation of over-investment and excess installed capacity in the mid-1980s, little investment had been made to increase installed capacity, and when, at the beginning of the 2000's, investments had to be made again to increase power, it coincided with the spread of the new combined cycle technology, which met with great success.

The first combined cycle plant to operate in Spain was that of San Roque (Cádiz) in 2002. The cycle was built by Gas Natural SDG with a power of 400 MW. In this way, Gas Natural SDG, like the former Catalana de Gas on different occasions, once again became a pioneering company and approached the electricity sector, but this time it did so with great force and in the following years its profile was clearly changed from a gas company to a gas and electricity company.

Gas Natural SDG's commitment to combined cycles led to the inauguration of the 400 MW combined cycle power plant in Sant Adrià de Besòs (Barcelona) in 2002, located on the land where TERBESA had had its fuel-gas thermals, which was part of the land acquired by Catalana de Gas y Electricidad in 1913 for the

construction of the first coal-fired power plant on the right bank of the Besòs River.

Later, in 2004-2005, the two groups in Arrúbal (La Rioja) were put into operation, providing an additional 800 MW. Additionally, in 2006, the 1,200 MW Cartagena (Murcia) cycle plant came into operation, as did the 800 MW Plana del Vent (Tarragona) cycle plant the following year. The list was completed with the two groups in the port of Barcelona with a combined power of 850 MW, and the 400 MW cycle of Malaga, inaugurated later.

Gas Natural SDG was also active internationally in the combined cycle business during these years, specifically in 2003 with the purchase in Puerto Rico of a 540 MW power cycle plant, and subsequently in 2007 with the acquisition of five cycles in Mexico with a combined power of 2,233 MW.

It was the technology of the day, agile, cheap, fast, efficient and less aggressive with the environment. With time, problems began to appear with these developments due to the massive introduction of renewable energies in the Spanish case, which, despite being more expensive and requiring significant state subsidies for many years, were promoted with exaggerated premiums in their initial stages, generating the well-known problem of the rate deficit in the Spanish electricity sector. In the new context, combined cycle plants, precisely because of one of their advantages, their flexibility of operation, have been assuming the role of backup of renewable energies: when there is no wind, water or sun, cycles are started up, given the impossibility of making the contribution of nuclear power plants more flexible. The paths to the future of the new generation of electricity will have to resolve the mix of technologies in order to provide us with the best way to meet the requirements of investment, cost, quality, safety and environmental impact.

A Possible Gas Natural Operation - Iberdrola

The liberalization of the market, which meant that the same company could not simultaneously possess gas pipelines and gas customers, but could have gas and electricity customers, or gas pipelines and power cables, brought the gas and electricity sectors closer together in the downstream, distribution and marketing sectors. On the other hand, combined cycle technology brought the two sectors together in the generation and supply of fuel for the plants. Gas companies would

be the major supplier of raw material for the production of combined cycle plants and electricity companies would be a major customer for gas supplies.

It was only a matter of time before mechanisms were set in motion to bring together the two sectors that had been basically kept apart until then. One example, a good precedent, was the merger of the German electricity companies VEBA and VIAG in 2000 which led to E.ON, which in turn took over the large German gas company Rhurgas in 2003, an operation which was not approved by the German Competition Court, but which was authorized by Gerhard Schröder's government.

The French case that brought GDF and Suez together is particularly interesting. Gaz de France (GDF)⁴⁴² was the national gas company in France, created in 1946 as a public company with the aim of nationalizing the gas industry in the country, in the form of a state monopoly.⁴⁴³ After many years, the evolution of the European context towards the liberalization of energy supply led to the transformation of Gaz de France into a public limited company (2004) in which the French state could not have less than 70%, which subsequently allowed it to be listed on the stock exchange (2005).

Suez was a private company, which came from the Compagnie Universelle du Canal Maritime de Suez, founded by Ferdinand de Lesseps in 1858 to finance the construction of the Suez Canal. Since the nationalization of the canal by the Egyptian government (1956), it had been reoriented towards a company for financial investment and industrial activity in energy and services. As a private company, it soon made some important moves, with the early acquisition of Lyonnaise des Eaux (1997), a company very active in the water and municipal services sector in different countries. It also acquired the Belgian gas company Distrigas⁴⁴⁴, as early as 2004.

But the big operation would be the merger of Gaz de France and Suez, in which the former took over the latter, an operation completed in July 2008, and in which the French state continued to hold at least 35% of the shares. At the time of the merger, Gaz de France had 14 million customers. Prior to the transaction and in order for it to be authorized, Distrigas had to be excluded from the corporate perimeter, which was acquired by the Italian company ENI. The new company was

442. Fàbregas (2011c), pp. 177-180.

443. Among the nationalized assets were the gas assets of the Compagnie Centrales d'Éclairage par le Gaz, Lebon et Cie. and those of the Lyonnaise des Eaux et de l'Éclairage, related to the introduction of gas and water into the city of Barcelona in the 19th century.

444. Distrigas had been created by the British Imperial Continental Gas Association in 1929.

renamed GDF Suez. Within a short time, and notably expanding its field of action, it definitively entered the electricity sector with the takeover of International Power in the United Kingdom in 2010. Finally, it was renamed ENGIE in 2015.⁴⁴⁵

In short, operations, operations, and more operations, of structuring the gas sector and the electricity sector within the reference framework of the large European companies.

In Spain, the movements started with other symptoms. In November of 1999, Repsol proposed a possible merger with Iberdrola, which was not accepted and did not succeed. One of the elements was the lack of synergies between oil and electricity, both at the distribution level and upstream. However, Repsol's movement did give rise to a reaction, which became evident a little later when, in September of 2000, Endesa and Iberdrola jointly presented a merger operation between the two companies, which would have given rise to a large electricity company with a high degree of control over the Spanish market, since they were clearly the two main companies in the sector.

Repsol's immediate reaction in the first days of October of 2000 was to present, together with Gas Natural SDG, to the government the possibility of making a takeover bid for Iberdrola. The position of the government of the time, which was theoretically a staunch defender of liberalism, did not, however, allow for the provision of the necessary framework making it impossible for the merger to advance and be successful, given the complex conditioning factors that had arisen.

However, time was passing and the need to integrate activities and create larger companies that could compete in international markets continued. In the important countries of Europe, gas and electricity energy companies were clearly already on a larger scale. In Europe, the rhetoric of defending the terms of competition, liberalization and the possibilities of new entrants was one thing, and the reality of existing companies, their size, their clustering and market dominance operations, was another thing, in preparation for the new era ahead in the energy markets.

The story continued when on March 10, 2003, Gas Natural SDG presented a takeover bid for Iberdrola. The operation was debated for months, but again it did not prosper due to the harshness of the conditions that were established in order to carry it out, in this case from the Comisión Nacional de Energía.

445. Some of the roots of today's ENGIE come from the companies of Charles Lebon and Ferdinand de Lesseps, whom we have seen acting from close perspectives in Barcelona and Egypt in the 19th century.

On June 23, 2003, the managing director was replaced once again, a position that went from José Luis López de Silanes to Enrique Locutura Rupérez, who had come from Repsol, as all had in recent years.

A New Chairman: Salvador Gabarró

The progressive purchase of Repsol shares by “la Caixa” transformed the bank into the company’s main reference shareholder, which on the one hand helped it to protect its investment in Gas Natural SDG, and on the other, allowed it to appoint a new chairman of Repsol to replace Alfonso Cortina, and Antoni Brufau was elected to this position. Brufau’s years as chairman of Gas Natural SDG were the years of the company’s adaptation to the liberalization of the energy markets, the entry into new activities, the modernization of instruments, combined cycle plants, and the start of the new headquarters, but mainly they were the years of the design of the strategy to bring the gas and electricity sectors closer.

On the occasion of the appointment of Antoni Brufau as chairman of Repsol YPF, Salvador Gabarró Serra, a renowned industrialist with a long and proven track record in achieving efficiency and results and who had already been a member of the Board of Directors since June of 2003, was appointed chairman of Gas Natural SDG. Salvador Gabarró was a PhD in Industrial Engineering from the Universidad Politècnica de Catalunya (UPC), and had worked for many years as managing director of the Compañía Roca Radiadores, S.A., a position he was appointed to in 1974. He had also been president of the Círculo de Economía de Barcelona. He was appointed chairman of the Board of Directors of Gas Natural SDG and of its Executive Committee in October of 2004.

The change was completed a few months later, when in April of 2005, Rafael Villaseca was appointed new CEO of Gas Natural SDG and member of the Executive Committee. Villaseca was an industrial engineer with a degree from the UPC, a MBA from IESE, and had worked intensely as manager (CEO) of important companies such as Panrico, Túneles del Cadí, GISA, INISEL and Nueva Montaña Quijano; he had also been a director of Amper and Enagás, as well as president of the Asociación de Antiguos Alumnos (Alumni Association) of IESE and member of the Board of Directors of the Círculo de Economía.

Gabarró’s years as chairman and Villaseca’s as CEO were marked by the process of convergence between gas and electricity, and the various ongoing disputes until

a final solution was reached with Unión Fenosa, but also by the impact of energy liberalization and the progressive globalization of activities. Also, and no less important, a characteristic that began at the time would be the great stability of the top management of the organization; Gabarró would occupy the chairmanship between 2004 and 2016, and Villaseca would act as CEO between 2005 and 2018.

The Takeover Bid for Endesa

Movements in the Spanish energy context continued, however, despite no results having been achieved, or perhaps precisely because of this. On September 5, 2005, Gas Natural SDG launched a takeover bid to acquire the entire share capital of Endesa, a company that had a significantly lower than normal share price in European utilities. In recent years, between the dividends and the stock market revaluation, Endesa's investors had not been able to recover even the cost of living index. Its stock price was depressed and thus it was a good time to attempt the takeover. Gas Natural SDG's offer of 21.30 euros per share was clearly above the market price, 14.8% higher than the closing price of the day before the announcement and 19.4% higher than the average price of the last six months.

The matter lasted a very long time and became politicized extremely early, producing tensions at times. Endesa's immediate reaction to the takeover bid was to describe it as insufficient and hostile and began preparing to defend itself. The procedure was initiated when the Comisión Nacional de la Energía (CNE) approved the operation after compliance with a series of conditions in the regulated activities in both the gas and electricity sectors, a decision that was appealed by Endesa. In November, the case was already before the Tribunal de la Competencia (Competition Court), while the European Commission decided that the operation had no Community dimension and that the Spanish authorities should therefore resolve the case.

In January of 2006, the Tribunal de Defensa de la Competencia (Court of Competition Defense) recommended that the government should not authorize the operation. The same court, but from the Comunidad de Madrid, issued a report rejecting the operation, although it was not clear that Endesa had customers in the Comunidad de Madrid at the time. However, at the beginning of February the government approved the operation with a large number of conditions, which Gas Natural SDG decided to accept, which led to an approach by Enel to acquire the assets to be sold in accordance with the government's rules.

The situation changed on February 21 when the German company E.ON appeared, launching a new takeover bid for Endesa at 27.50 euros per share, 29% higher than the price offered by Gas Natural. The German takeover bid was valued positively by Endesa, although it was still considered insufficient, while the government was beginning to worry about the possibility of a large Spanish company such as Endesa becoming foreign-owned, and gave more powers to the Spanish regulators, the Comisión Nacional de Energía (CNE), to halt, where appropriate, the takeover bid by E.ON, an action that was rejected by the European Commission.

Gas Natural SDG continued its efforts, and on February 27 the Comisión Nacional del Mercado de Valores (National Securities Market Commission) (CNMV) approved the takeover bid by Gas Natural; on March 6 the acceptance period began. One of the first consequences of the legal battle that had begun immediately after Gas Natural's first offer was that a commercial court in Madrid ordered the precautionary suspension of the processing of the takeover bid on March 21. A month later, on April 21, the Tribunal Supremo (Supreme Court) decided to suspend the Consejo de Ministros' decision to authorize the takeover bid by Gas Natural, which Gas Natural immediately appealed.

Meanwhile, on April 25 the European Commission (EC) approved E.ON's takeover bid for Endesa without conditions, and on July 27 the CNE approved it under nineteen conditions, obliging the German company to dispose of 32% of the assets.

The situation was turned upside down when Acciona announced on September 25 that it had bought 10% of Endesa and that it could buy up to 24.9%. The next day E.ON, with incredible agility, increased its offer by 10 euros per share.

Finally, on January 23, 2007, the Tribunal Supremo lifted the precautionary suspension of the takeover bid by Gas Natural, which was thus able to resume its course. However, on February 1, Gas Natural's Board of Directors announced that: "Gas Natural decided not to participate in a takeover bid process that it considers to be unequal and agreed to abandon its bid to acquire 100% of Endesa", considering that "the company has been immersed in an irrational and long-standing political, social and legal controversy".⁴⁴⁶

The evolution of events, from September of 2005, when Gas Natural presented its takeover bid to February of 2007, when it abandoned the operation, had been plagued by difficulties, financial and business issues, but also by political interpretations and questioning at all levels.

446. CNMV.GN. Relevant fact. *Posición en relación proceso oferta sobre Endesa, S.A. (01-02-2007)*.

An additional element of complexity was the different regulations applicable to the takeover bids by Gas Natural and E.ON, the first of which was to be resolved by the Spanish authorities and the other by the European Community. Attempts by the Spanish authorities to equalize the treatment were constantly denounced by Brussels, and proceedings were begun against Spain, which were damaging to the situation of the Spanish company.

On the other hand, the duration of the whole process and the escalation of the prices of the offers for Endesa shares had reached prohibitive limits, which were beyond all economic logic and which the purchaser would then have to assume.

Endesa's situation ended with a strong appearance on the scene of Enel, acting in consort with Acciona, during the months of February and March of 2007, which led to E.ON's withdrawal of its takeover bid in April. Following this, Enel and Acciona presented the final takeover bid of 41.3 euros per share, which, when it was wound up in October of 2007 was a success, as it gained 92% of the company's shares. Acciona eventually withdrew from Endesa, and a large Spanish electricity company thus came to be managed from Italy. Enel would then separate its important assets in Latin America from Endesa, significantly reducing its size and focusing on its activity in Spain. With all these movements, the falls that Catalana de Gas y Electricidad had built on the Ésera River at the beginning of the 20th century ended up among the assets of Acciona, with the Seira power plant at the head.

The Return to Barceloneta: A New Headquarters

With the growth of the company, the traditional headquarters of Portal de l'Àngel in Barcelona had become too small, and, despite its historical value, the fact that the company was no longer the same had to be taken into consideration. There was no comparison between the Gas Natural SDG of the late 1990s, and the Sociedad Catalana para el Alumbrado por Gas that had installed itself in the building in 1895; furthermore, more than a hundred years had passed.

The closure of the gasworks in Barcelona, although it had forced a massive transfer of land to the Barcelona City Council, had also made it possible to retain a location in the area of the former Barceloneta gasworks that could be suitable for the planning of an ambitious project for a new head office. It was in this context that the Board of Directors, presided over by Antoni Brufau, decided to build a new headquarters in Barceloneta; it was thus returning to the area of Barcelona

where gas production began in Spain and also to the site of the company's industrial history.

The development of the project was lengthy; in 1999, an architectural competition was held that Enric Miralles' design clearly won, founder of the EMBT Arquitectes associats⁴⁴⁷, with his partner Benedetta Tagliabue. At that time, Enric Miralles was probably the most renowned Catalan architect, internationally famous and with a great future projection. Among his works are the Scottish Parliament, the renovation of the Santa Caterina market in Barcelona, the National Library of Japan in Tokyo, the Court of Justice in Salerno, the Sports Palace in Leipzig, the School of Music in Hamburg and the Diagonal Mar Park in Barcelona, among many other works.

Unfortunately, Enric Miralles died in 2001, at just over forty years of age, without being able to complete several works, including the Gas Natural building, which would finally see the light of day thanks to the efforts of continuity and style of Benedetta Tagliabue. In the same year, steps were taken to move forward and the company Torre Mare Nostrum (55/45) was set up between Inmobiliaria Colonial and Gas Natural SDG to develop the project for the planned architectural complex.

Meanwhile, Gas Natural SDG, through its corporate e-Business management, started the sale process of the buildings on Avenida del Portal de l'Àngel, Calle del Arcs and offices on Calle de Castanyer through an innovative online auction system for real estate assets on the Internet, used for the first time in Spain, which made it possible to obtain the best prices, ensuring a transparent and respectful procedure with all bidders. The sale of these buildings was with the clause of temporary occupation and payment of rent until the definitive and expected transfer to the new Barceloneta headquarters.

Construction work began and continued until the final completion of the project. The quality and architectural significance of the complex can be assessed by the impact of the building's model — the first symbol of Enric Miralles' work — which was exhibited at the Aedes Gallery in Berlin, and which later, in 2006, went to the Museum of Modern Art in New York, the famous MoMA, as part of the exhibition *On site: New architecture in Spain*. Such was the interest, and also its singularity and importance, that finally the Museum of Modern Art acquired the model of the Gas Natural SDG building for its permanent collection of architecture.

The headquarters building, which had begun its journey with an architectural competition in 1999, was practically finished by the summer of 2006. During the

447. EMBT (2009); Tagliabue (2016).

month of September, Gas Natural SDG employees began moving from different buildings in the city to occupy it. The process ended in late November when the building was fully operational with an initial occupation of about a thousand people. This meant definitively leaving several of the company's buildings, but very particularly the building on the Portal de l'Àngel, which had been the company's headquarters for more than a hundred years. However, the company returned to its origins, to the first gasworks, where it all began, way back in 1842.

The new complex is composed of a twenty-storey tower with a glass facade and a horizontal cantilevered building, which extends from the middle part of the tower, specifically between the fifth and ninth floors. A third long, four-storey building, also with a glass facade and cascaded, completes the complex.⁴⁴⁸

The complex is surrounded by a landscaped area, which creates a square between the complex of buildings and the Paseo de Salvat-Papasseit, a new square open to all citizens, which has been named the Plaza del Gas, evoking the permanent mission of the area to the gasworks and subsequently to the headquarters of Gas Natural SDG.

From the created square, there is a pedestrian crossing between the buildings that connects the Calle del Doctor Aiguader with the Parque de la Barceloneta, through which the characteristic image of the Torre de las Aguas, by Domènech Estapà, one of the preserved modernist elements of the old gasworks, can be seen in the background.

Finally, on January 24, 2008, the monarchs of Spain, Juan Carlos and Sofia, inaugurated the new headquarters of Gas Natural in Barceloneta, just a few days before the celebration of the 165th anniversary of the constitution of the company that created the gas sector in Spain, and which at that time was already called Gas Natural SDG, S.A.

The complex, with its moderate heights and infinite surfaces that are ever-changing with the reflections of its glass skin, has become a reference point for the architecture of the city and its new and respectful skyline. Its creators, EMBT, commented: "Like a living creature that reacts to external impulses, the new building of the Gas Natural company develops and expands the different conditions of the program and the complex surroundings".⁴⁴⁹

448. Permanyer and Sabaté (2007), pp. 8-48; Tagliabue (2016).

449. EMBT (2009).

2009-2016

Gas Natural Fenosa:
Gas and Electricity

The period that began in 2009 is of great significance for Gas Natural SDG, — which would become Gas Natural Fenosa —, both because of the importance of the operations and actions carried out and because of the complexities of the context, dominated by the consequences of the last major economic crisis that began with the problem of subprime mortgages in the United States in 2007. The effects of the crisis made the situation of citizens and businesses difficult for a long time. Spain suffered the worst impacts of the crisis in the period from 2008 to 2014, with a lack of growth and even a reduction in GDP, a very significant rise in unemployment and in the risk of poverty and social exclusion (Table 57).

From the perspective of GDP growth, the worst year of the crisis was 2009, and a return to pre-crisis levels was not possible until 2015. As for unemployment, the hardest years were 2012 and 2013; the rate then started to fall, but in 2017 it was still at twice the rate before the crisis, no doubt due to the lack of stimulus for construction and other types of employment that do not require prior training.⁴⁵⁰

450. One of the main reasons for structural unemployment in Spain is the shortage of vocational training graduates compared to the European average. In the training pyramid of the Spanish population, 20% fewer people than in the European population have completed a vocational training course, which makes them less adaptable to changes in the economy when jobs that do not require prior training disappear or are reduced, as is often the case with those related to the construction sector or to tourism and the hotel and catering industry. Also in Spain, Long Life Learning, a basic concept in the most modern and competitive societies in the international context, is less prevalent.

Table 57. Spain. Economic indicators (2007-2017)

Year	GDP (% growth)	Unemployment (% population)	Risk of poverty (% population)
2007	3.8	8.57	NDA
2008	1.1	13.79	23.8
2009	-3.6	18.66	24.7
2010	0.0	20.11	26.1
2011	-1.0	22.56	26.7
2012	-2.9	25.77	27.2
2013	-1.7	25.73	27.3
2014	1.4	23.70	29.2
2015	3.4	20.90	28.6
2016	3.3	18.63	27.9
2017	3.1	16.55	NDA

Source: Instituto Nacional de Estadística. See www.ine.es [accessed 14-04-2018].

Finally, the at-risk-of-poverty and social exclusion rate⁴⁵¹ is even more rigid; it peaked in 2014 and began to improve the following year, but has remained at levels clearly higher than those before the crisis period.

The Merger with Unión Fenosa

The strategic logic of contact between gas and electricity was still present in the context of Gas Natural SDG as an important way forward, when the opportunity arose with ACS and Unión Fenosa. On June 30, 2008 it was announced that Gas Natural SDG had reached an agreement with ACS, which was at that time the main shareholder of Unión Fenosa, to buy 43.5% of the shares in the electricity company after obtaining the appropriate permits. The operation was very important and in order to finance it in a few weeks, an important credit operation of up to 19 billion euros was organized with the banks.

The Definitive Symbiosis of Gas and Electricity (2009)

On February 12, 2009, the Comisión Nacional de la Competencia (National Commission on Competition) (CNC) gave its authorization and on March 4, the chairman of Gas Natural SDG, Salvador Gabarró, was appointed new chairman of Unión Fenosa. Among the conditions imposed by the CNC on the operation were: the sale of 600,000 gas supply points and associated domestic customers, the sale of 2,000 MW of installed capacity in combined cycle plants, as well as maintaining the autonomy of Unión Fenosa Gas Comercializadora and the sale of its stake in Enagás.

A takeover bid by Gas Natural SDG for Unión Fenosa was immediately considered, with a positive result. It was liquidated on April 21 and, at that time, control of 95.22% of the share capital of Unión Fenosa was obtained, with the shares from ACS, other small acquisitions and the result of the takeover bid. The respective boards of directors immediately approved the plan to merge the two companies, proposed a merger by absorption in which Gas Natural SDG absorbed Unión

451. The risk of poverty and/or social exclusion presented corresponds to the AROPE indicator (At risk of poverty or social exclusion), which is the main follow-up measure to the EU 2020 Strategy poverty target, which considers people at risk of poverty and/or social exclusion to be those who are in one of the following three situations: people living on low incomes (60% of the median income equivalent or per consumption unit in the year prior to the interview), and people suffering severe material deprivation (4 of the 9 items defined), and people living in households with very low employment intensity (below 20% of their total employment potential in the year prior to the interview). The indicator does not include people over 60 years of age.

Fenosa and the latter disappeared. The exchange ratio was established at 3 shares of Gas Natural for every 5 shares of Unión Fenosa. The General Shareholders' Meeting of Gas Natural SDG, held on June 26, 2009, and the General Shareholders' Meeting of Unión Fenosa, held three days later, approved the merger plan unchanged and gave it free rein.

The formal merger operation was executed on September 1, 2009 and led to the emergence of a new company, of unprecedented size, bringing together in a single company the leader in natural gas in Spain and the fourth largest liquefied natural gas (LNG) operator in the world, with the third largest Spanish electricity company, which also had a high-growth gas business and quality assets. With the operation, a very important change in positioning and size was achieved; the company went from being in 9 countries to developing activities in 22 countries, with 20 million customers (previously 11.5 million) and 17 GW of installed electrical power, whereas before it had only 4 GW. It was another company, both in terms of size and strategy; gas and electricity had definitely been brought together and the future strategy that had been desired for so many years could finally be set in motion (Table 58).

The important acquisition clearly increased the company's indebtedness, the control and progressive reduction of which would be one of the main keys to success in the following years, together with a demanding program of synergies. The final structuring of the loans for the acquisition represented 13,329 million euros, a huge financial effort.

Unión Fenosa also provided knowledge that Gas Natural SDG did not have: that of hydroelectric generation technologies, coal-fired power plants and nuclear

Table 58. Gas Natural SDG and Unión Fenosa. Pro forma comparison (26-06-2009)

Pro forma comparison	Gas Natural SDG	Gas Natural SDG + Unión Fenosa
International presence	9 countries	22 countries
Average workforce 2008	6,850 people	20,079 people
Clients	11.5 million	20 million
Installed electrical power	4 GW	17 GW
Net turnover	13,544 million €	20,733 million €
Ebitda	2,564 million €	20,733 million €
Value of assets	18,675 million €	38,113 million €

Source: Gas Natural SDG. *Presentación Junta General de Accionistas* (26-06-2009).

power plants. It also contributed to international positioning in different activities in countries such as Costa Rica, Panama, Dominican Republic, Guatemala, Nicaragua, South Africa, Kenya, Egypt, Oman and Moldova. And from another perspective, a functioning corporate university and a museum of contemporary art in Galicia. Many subjects that helped to enrich the mix and which avoided duplication and overlap.

The integration of the two companies came naturally: the two companies came from previous mergers and both were involved in gas and electricity activities. Both also had an extensive international deployment record. Obviously, there were things to polish and integrate, but the collaboration of the two organizations was basic to the orderly advance towards a new reality. Perhaps Gas Natural SDG came from a world of greater competition and operational agility, and Unión Fenosa came from an environment of greater appreciation of technical skills due to the technological complexity of energy generation. Electricity required more investment per unit of energy sold and more staff, and needed more significant installations, whereas gas did not require plants. Everyone could contribute and learn. Both the international position and the cross positions in gas and electricity were clearly complementary.

History of Unión Fenosa (1982-2009)

Unión Fenosa⁴⁵² appeared through the merger carried out on November 23, 1982 between Unión Eléctrica and Fuerzas Eléctricas del Noroeste, S.A. (Fenosa), which brought together in a single company the interests of one of the traditional electricity companies in Madrid with the electricity company par excellence of Galicia. The operation was completed with the takeover of Fenosa by Unión Eléctrica, the company name was changed to Unión Eléctrica Fenosa, and Julio Hernández Rubio was appointed chairman and Carmela Arias, Countess of Fenosa, honorary chairwoman. It was the first integration of important electricity companies in Spain, an operation that made it possible to integrate the markets and the clearly complementary production resources of the Madrid and Galicia areas and to rank third in terms of size among the country's electricity companies. It is worth noting that, despite the fact that Unión Eléctrica took over Fenosa, in less than a year the new company's team came from Galicia, with the appointment of Julián Trincado as chairman and Victoriano Reinoso as managing director in 1983.

452. Unión Fenosa (2009).

Julián Trincado Settler (Valencia, 1921 - Madrid, 2000) was a civil engineer and the creator of the modern Fenosa. He had started at Saltos del Sil and Eléctricas Leonesas; in 1971 he joined Fenosa as managing director, where he was subsequently appointed executive managing director (1979) and CEO (1982). Once the merger with Unión Eléctrica was completed, he was appointed CEO of the new Unión Eléctrica Fenosa. At the end of 1983, he was appointed chairman of the company, a position he held for ten years, until José M. Amusátegui replaced him. He had to manage the integration of two companies with a long past, but with different cultures and practices, generating and consolidating Unión Eléctrica Fenosa in particularly difficult times. A great fan of the artistic avant-garde, he promoted the Mostra Unión Fenosa, the germ of the company's future Museo de Arte Contemporáneo (Museum of Contemporary Art), and received the gold medals for Merit in Fine Arts and that of Castelao.

One of the most important efforts of the new company was the development of modern management systems on an important IT basis to facilitate the capture of synergies from the merger operation. Its implementation began in 1985 and significant results were achieved, which allowed it to begin international activity in 1986 with a contract in Uruguay. The effort in this direction culminated in 2000 with the creation of Soluziona, which integrated the different professional services companies of Unión Fenosa, with the aim of offering information technology solutions and services to the market. Soluziona, with over 3,000 employees, was eventually integrated into Indra in 2006.

Following the start-up of the José Cabrera and Almaraz plants, the nuclear power plant activity was expanded in 1988 with the Trillo (Guadalajara) plant on the Tagus River.⁴⁵³ The plant was promoted by Unión Eléctrica in the mid-1970s and the Asociación de Trillo was set up in 1977, with Energía e Industrias Aragonesas and Eléctricas Reunidas de Zaragoza, although two years later, when construction began, Unión Eléctrica had to face the challenge on its own, and Endesa entered in 1982 with a 20% stake. Subsequently, on the basis of various exchanges of assets between electricity companies, a 34.5% stake was reached. The Trillo plant, the most modern Spanish nuclear power plant, has Siemens/KWU PWR technology and an electrical power of 1066 MW.

In 1993, when José M. Amusátegui was appointed chairman of the company to replace Julián Trincado, Victoriano Reinoso was also appointed vice-president and

453. Central Nuclear de Trillo (2013), pp. 15-24.

CEO. This marked the beginning of an important phase of entry into new business sectors and the progressive internationalization of the company's activity.

Victoriano Reinoso (Negreira, 1948 - A Coruña, 2002) was the civil engineer and master of Civil Engineering at IESE who created the modern Union Fenosa. He had started at Unión Eléctrica Madrileña in 1972, but by 1975 he was already at Fenosa as an assistant to the managing director, responsible for Finances and, later, director of the Studies, Works and Resources area. When the merger that created Unión Eléctrica Fenosa took place, he was appointed financial manager and director of Works, Planning, Operations and Personnel, and became managing director when Trincado was appointed chairman in 1983. Six years later, he became CEO and, in 1993, vice-president with Amusátegui. In March of 2002, he replaced him as chairman. He then appointed his collaborators Honorato López Isla and Elías Velasco — CEO and managing director respectively — and tried to acquire Hidroeléctrica del Cantábrico, although his untimely death that same year stopped any new developments. Reinoso was also the driving force behind the Club Español de la Energía (Spanish Energy Club), an organization he presided over from its creation in 1985 until his death in 2002.

The orientation towards new fields of activity began in 1994 with the participation in Airtel, which was later sold to Vodafone. The company also participated in Retevisión between 1997 and 2005. Unión Eléctrica Fenosa's international investment process began in 1998 with the award of the contract for the construction of a 250 MW combined cycle power plant in Hermosillo (Mexico). That same year, activities began in Panama. In 2000, the company entered Colombia, the Dominican Republic, Nicaragua and Moldova, and in 2007, Costa Rica.

Unión Eléctrica Fenosa entered the gas sector in 2000 with the signing of a contract with the Egyptian General Petroleum Corporation to have its own gas available at source, and participated in the construction of the liquefaction plant in Damietta (Egypt), which started up in 2005. This activity was complemented by the regasification plant in Sagunto and the Reganosa plant in Ferrol, completed in 2007. It also took part in the construction of one of the liquefaction trains of the Sultanate of Oman, which was put into operation in 2006. The Italian company ENI became a shareholder of the gas company Unión Fenosa Gas in 2003, with a 50 % stake, through a dedicated capital increase of 440 million euros. This consolidated an important alliance in the gas sector.

From another perspective, the inauguration in 1995 of the Museo de Arte Contemporáneo in A Coruña, promoted by the sensibility of Julián Trincado, as

a continuation of the exhibitions of painting and sculpture held biennially by the company since 1989, is also worth mentioning. The museum, oriented to the work of contemporary visual artists, was expanded in 2005 and has become a true reference in Galicia.

After the merger of Gas Natural SDG and Unión Fenosa, the Museo de Arte Contemporáneo de A Coruña was defined as a multidisciplinary center of contemporary culture, whose prestige and quality should be a point of reference in the Spanish socio-cultural sphere, convinced that “art contributes to the cultural enrichment and development of people’s creative thinking”, and with the aim of “giving a boost to the projection of the valuable artistic heritage represented by our museum’s contemporary art collection”.

In 2000, the Universidad Corporativa was set up, the first in Spain to “promote the permanent development of people, aligning their training with the needs generated by business strategies, within the framework of a corporate culture of commitment to knowledge”. For its development, the campus of Puente Nuevo was built, located in El Tiemblo, in the province of Ávila, with a surface area of 4 hectares, residential and with teaching capacity for more than 150 people. The merger process with Gas Natural SDG consolidated the position of the Universidad Corporativa, which now has academic and residential spaces in different countries. In addition, in 2011, the implementation of the company’s Universidad Virtual was begun.

Coinciding with the transfer of its headquarters from Capitán Haya to Avenida de San Luis in Madrid in 2002, Unión Eléctrica Fenosa changed its name to Unión Fenosa to reflect its entry into other activities, such as gas and telecommunications. Finally, in 2003 the Italian company Enel took a stake in the renewable energy company of the Unión Fenosa group. Over time, this company would be transformed into EUFER (Enel Unión Fenosa Renovables) with the 50% participation of the two groups.

The new chairman who replaced Victoriano Reinoso in 2002 was Antonio Basagoiti, representing the Banco de Santander, the company’s main shareholder at the time, who was in turn replaced by Pedro López Jiménez as ACS’ representative, when it acquired the controlling stock in 2005. Pedro López Jiménez, also a civil engineer and PADE from IESE, had been director general of Ports and undersecretary of the Ministry of Public Works and Urban Development, as well as chairman of Endesa and advisor to Enher and the Instituto Nacional de Industria, and one of the founders of the CEOE. At that time he was already a close

collaborator of Florentino Pérez in ACS. In 2008, López Jiménez oversaw the process of acquisition of Unión Fenosa by Gas Natural SDG, which would give rise to Gas Natural Fenosa.

Unión Eléctrica Madrileña and the Madrid Market (1912-1982)

The Unión Eléctrica Madrileña⁴⁵⁴ had been constituted in Madrid, on February 10, 1912, by three important partners: Salto de Bolarque, Sociedad de Gasificación Industrial and Compañía General Madrileña de Electricidad. The new company was created with the aim of supplying electricity to the capital and cities of Castile, and to develop the potential of the Júcar, Alberche and Tajo rivers, initially supplying electricity to Madrid from the production of the Bolarque falls.

The Bolarque falls (Guadalajara) had been promoted in 1907 by Juan Ron and the Marquis of Urquijo, who had started the work on the hydraulic power plant on the Tajo and Gudiela rivers. The facilities, which brought the electricity generated to the city of Madrid, were inaugurated on June 23, 1910 by King Alfonso XIII. The Sociedad de Gasificación Industrial, founded in 1902 by the Urquijo family and with Eduardo Dato as chairman, produced thermal electricity in Madrid from gas. While the Compañía General Madrileña de Electricidad, as explained above, had been established in 1899 by the Compañía Madrileña de Alumbrado y Calefacción por Gas together with the German AEG to produce thermal electricity, it was at that time the main electricity distribution company in the city of Madrid.

The new company was strongly positioned in the competitive electricity market of Madrid at that time thanks to the supply from Bolarque, and in 1921 it participated in the constitution of Gas Madrid, after the process of municipalization of the former Compañía Madrileña de Alumbrado y Calefacción por Gas. Some points in the development of Unión Eléctrica Madrileña were the use of the Júcar River, with the Toba reservoir, and the inauguration in 1926 of the Villalba de la Sierra power plant and also the purchase of Saltos del Alberche in the same year. Years later, in 1965, the Narcea coal-fired power plant in Tineo (Asturias) started operating.

One of the fundamental points in the history of Unión Eléctrica Madrileña was the start-up in 1968 of the José Cabrera nuclear power plant in Almonacid de Zorita (Guadalajara)⁴⁵⁵, built and operated by the company itself, which initiated

454. Fábregas (2012c), pp. 46-47; García de la Infanta (2002), pp. 162-184.

455. Herrera (1998), pp. 53-77; Fábregas (2015a), pp. 46-47.

the nuclear electricity sector in Spain. The plant closed definitively in 2006, having produced a total of 36,515 GWh. If Gas Natural SDG introduced natural gas in our country, Unión Eléctrica Madrileña introduced nuclear energy, both pioneering companies in their respective sectors. The nuclear investment would continue with 11% of the Almaraz plant in Cáceres, on the Tagus River, inaugurated in 1981.

Unión Eléctrica Madrileña carried out the merger with Hidroeléctrica de Moncabril in 1969, which led to its company name being updated to Unión Eléctrica the following year, given that it now operated in both Madrid and Galicia. The process of introduction in Galicia was consolidated with the merger with Fenosa in 1982.

Fenosa's Galician Character and the Sociedad General Gallega (1900-1982)

Fuerzas Eléctricas del Noroeste (Fenosa) was the protagonist and heir to the important process of introducing electricity and consolidating the sector in Galicia. The process began in 1900 with the constitution of the Sociedad General Gallega de Electricidad (SGGE)⁴⁵⁶, with a capital of 2 million pesetas from the business milieu of the bank of Sobrinos de J. Pastor, with the aim of exploiting the Segade falls on the Umia River and the A Fervenza falls on the Belelle. The definitive structuring of the sector was carried out with a vertex in A Coruña, with the constitution in 1918 of Fábricas Coruñesas de Gas y Electricidad (FCGE), also in the circle of Sobrinos de J. Pastor, which absorbed the former French gas and electricity company; and with another vertex in Ferrol, with the Sociedad General Gallega de Electricidad, which absorbed in 1923 the Sociedad de Gas y Electricidad de Santiago and the Electra Popular de Vigo y Redondela.

These movements came from the interest, in 1923, of the companies of Ferrol, Vigo and Santiago, which supplied more than 70% of Galicia's electricity, in joining forces to build the Tambre power plant, which would be the largest hydroelectric power plant in Galicia and would provide energy in significant quantities and at a clearly competitive price. The project included four groups of 5,000 hp each, with transport lines at 66,000 volts to reach A Coruña and Vigo, a project of unprecedented size. The Tambre plant, with its building designed by the architect Palacios, is considered as one of the 100 most important elements of Spain's industrial heritage.

456. Fábregas (2012e), pp. 46-47; Carmona (2016), pp. 51-52; García Fontenla (1990), pp. 107-131.

But in the 1930s, Electra de Viesgo⁴⁵⁷ was introduced in Lugo, and became the first entry into Galicia of a non-Galician electricity company. The situation was stabilized with an agreement between the Sociedad General Gallega de Electricidad and Fábricas Coruñesas de Gas y Electricidad and Electra de Viesgo, ceding the market in the province of Lugo to Electra, committing that when they needed more electricity for their markets, once the possibilities of the existing installations had been overcome, they would buy it from Viesgo; and also renouncing the construction of new plants for twenty years (1935-1955).

With the strong demand for electricity in the post-war period, the need for more falls became increasingly evident. However, the agreement with Viesgo did not allow the Sociedad General Gallega de Electricidad to build new facilities, and another company, Fenosa⁴⁵⁸, was founded on August 23, 1943 in Vigo, in the vicinity of the same shareholders, but without any previous commitments, agreements or limitations, and led by Pedro Barrié de la Maza. The company was set up to solve the same problems that Catalonia Hidroeléctrica de Cataluña, S.A., created by Catalana de Gas y Electricidad at the same time, had to face in Galicia.

Fenosa would become the big Galician electricity company, structuring the sector. It started its activity immediately with the rapid construction of falls and power plants. After the end of the twenty years of the historical pacts, it absorbed the Sociedad General Gallega de Electricidad in 1955, which had previously absorbed Fábricas Coruñesas de Gas y Electricidad in 1946, and acquired the Electra Popular de Vigo y Redondela and the Sociedad de Gas y Electricidad de Santiago in 1918, among many other companies. The latter companies owned the gasworks in the cities of A Coruña, Vigo and Santiago, respectively.

Fenosa's construction dynamic began with the As Conchas falls, inaugurated in 1949, then the Os Peares falls (1955), the Eume reservoir (1960) and the Belesar reservoir (1963) on the Miño River, at that time the most important in Spain, and later the Velle reservoir. There was then intense activity in hydroelectric installations, complemented by thermal power plants, such as the 460 MW Sabón plant, started up in 1975, or the Meirama plant, for the use of a brown coal strip mine not far from A Coruña. Inaugurated in 1980, Meirama had an automatic coal feed to the plant, with a conveyor belt of more than 6 kilometers.

457. Electra de Viesgo, although incorporated in Bilbao, was the electricity company of Santander and would eventually introduce itself in Asturias and later in Galicia.

458. Fenosa (1980), pp. 11-18; García Fontenla (1990), pp. 137-163; Carmona (2016), pp. 183-193.

Fenosa's enduring, historical presence in the territory, its roots, the work and the days of Pedro Barrié de la Maza and Banco Pastor gave rise to an intense feeling of integration and harmony between the company and Galicia. In the 1950s, it was already the second largest, non-financial company in Galicia due to the importance of its assets, surpassed only by Empresa Nacional Bazán, a shipbuilding company. It would take a few years, but in 1973 it was the largest company in Galicia, with 3,366 workers. Finally, in 1982, it was absorbed by Unión Eléctrica Madrileña.

After the stage of Unión Eléctrica Madrileña, the approach of Gas Natural SDG in 2009, with its clear sensitivity to environments and roots, the intense relationship with Galician society at all levels, and the importance of the approximately three million customers in the gas and electricity distribution and commercialization business in Galicia, allowed it to foresee the beginning of a new path of proximity and closeness in the context of the future framework that was being envisaged.

The Centenary of Bolarque (2010)

The year 2010 marked the first hundred years of the inauguration of the Bolarque falls by H.M. Alfonso XIII in 1910.⁴⁵⁹ As has been explained, the falls, located in the municipality of Almonacid de Zorita (Guadalajara), had been developed by Juan Ron and the Marquis of Urquijo, and was one of the fundamental elements in the creation of the Unión Eléctrica Madrileña in 1912. The arrival of electricity from Bolarque to Madrid had made possible an important leap forward in the electrification of the capital, due to the amounts available and the low price of its production, as well as important advances in the competitive electricity market of those years. Bolarque, later called Bolarque I, had been one of the largest projects of its time and had stood out as one of the first Spanish hydroelectric power plants to generate alternating current.

Years later, a second plant, Bolarque II, was built on the same site and was inaugurated in May of 1974 by the then princes of Spain, Don Juan Carlos and Doña Sofía. This new power plant allowed electricity to be produced and, during off-peak hours, also water to be pumped, but, and this is its great peculiarity, not at the source but at the head of the Tagus-Segura transfer, thus feeding one of the country's main hydraulic works.

459. Fernández Izquierdo (2010), pp. 26-43.

The centenary celebration was held with the inauguration of a third power plant in the same place, in this case the Los Molinos mini power plant, with a capacity of 4 MW, which allowed the water discharged into the Tagus River to be used as an ecological flow to generate electricity from a low flow. The new plant was inaugurated by the then Prince of Asturias, Don Felipe of Bourbon, on July 26, 2010, in the period of Gas Natural Fenosa.

Divestments and a New Brand

With the merger of Gas Natural SDG and Unión Fenosa, almost all the objectives of the company's Strategic Plan had been achieved in one operation. The framework was in place and it was now only a matter of consolidating the expectations created. The Comisión Nacional de la Competencia had imposed compulsory divestments on the merger operation as a condition of the merger and, in order to reduce the level of indebtedness as quickly as possible, the company had also announced divestments to the financial market amounting to 3 billion euros; the two objectives coincided and the program was immediately launched without delay.

The transfer of gas networks in Madrid was carried out in several stages that involved the transfer of 810,000 supply points to the Madrid-based company Red de Gas, controlled by Morgan Stanley Infrastructure, and 245,000 to Endesa⁴⁶⁰, while the networks in Cantabria and Murcia were sold to the Portuguese group EDP with 250,000 associated supply points. Also, 400 MW of the combined cycle plant of Plana del Vent (Tarragona) were sold to the Swiss group Alpiq, and the 800 MW Arrúbal (La Rioja) to the North American operator Contour Global.

In addition, 2,233 MW of combined cycle plants in Mexico were sold to Mitsui&Co (70%) and Tokyo Gas (30%), and the electricity distribution assets in Guatemala were sold to the Actis investment fund, as well as 64% of EPSA's assets in the Colombian electricity sector. The electricity transmission assets in Spain were also transferred to Red Eléctrica de España, and the 35% stake in Gas Aragón was transferred to Endesa. Finally, other investments such as CEPSA (5%), Indra (18%) and Enagás (5%), among others, were sold.

460. CNMV.GNF. Relevant fact. *Venta de 245.000 clientes de gas en Madrid (29-02-2012)*.

In August of 2010, the ownership interest in EUFER (Enel Unión Fenosa Renovables), a company in which Enel Green Power and the former Unión Fenosa had a 50% stake, was also reorganized. The partners agreed on the distribution of the assets and the liquidation of the company, with which the new group managed to consolidate a position of 1,000 MW in the special energy regime for renewable energy, between the developments made previously and this contribution, including renewable energies and cogeneration.

One of the questions that had to be resolved, of great relevance in the current era of communication, was which name, which brand, which symbol should be used for the company resulting from the important merger operation between two companies with strong personalities, as was the case with Gas Natural SDG and Unión Fenosa. After the pertinent studies and reflections, the proposal on how to adapt the signs of identity to the new situation was presented at the General Shareholders' Meeting held on March 20, 2010 and was approved.

The company name would continue to be Gas Natural SDG, while Gas Natural Fenosa was introduced as a new brand, with a new customized typography. According to the company, the new brand integrated the "high level of recognition and experience associated with the two brands separately, so that they perfectly reflect the company's positioning, based on inherent positive attributes such as reliability, experience, proximity and commitment", giving the organization "a single identity, solid, integrating and with a track record, which reflects a more dynamic and modern character while reducing the visual complexity of the coexistence of both brands".

As a symbol it was decided to keep the butterfly that identified Gas Natural SDG as a well-known and recognized emblem that expressed attributes of freshness, freedom and constant movement. It had been a risky bet in 1992, but the intervening years had demonstrated its high level of acceptance and recognition.

The Consolidation of the Internationalization Process

Prior to the merger with Unión Fenosa, which once again boosted the company's process of internationalization, Gas Natural SDG had managed to take advantage of different opportunities in the global context. After Latin America came Europe, specifically Italy, where in 2002 a gas and electricity trading company was initially created: Gas Natural Vendita Italia SpA. Subsequently, the gas distribution activity

began, supplying more than 200 municipalities in the regions of Puglia, Sicily, Calabria, Basilicata, Lazio, Abruzzo, Campania and Molise. Also in Italy, administrative procedures had been initiated for the authorization of a regasification plant in Trieste with a capacity of 8 bcm/year.

In Puerto Rico, a 47.5% stake was acquired in 2003 in Ecoeléctrica, which had a combined cycle capacity of 263 MW and a regasification plant that accepted methane tankers of up to 140,000 cubic meters. The facility, commissioned in 2000, also had a 160,000 cubic meter storage tank. In 2012, the supply of natural gas to the Autoridad de la Energía Eléctrica de Puerto Rico (Puerto Rico Electric Power Authority) began.⁴⁶¹

In 2004 the company Gas Natural West Africa (Gas Natural 40% and Repsol 60%) was created for the search and development of natural gas resources in Angola; work began in 2008 and in 2009 the corresponding concession was obtained from the government of the country. Upstream work was also carried out in Morocco, where gas was discovered in the Tangier-Larache area, and the company held 24% of the shares in the consortium.

In September of 2004 Gas Natural SDG decided to start operations in France, and created Gas Natural Commercialisation France, which in 2009 became Gas Natural Europe, to develop gas trading activity in new countries. In April of 2010 it was licensed to operate in Belgium and Luxembourg, and in 2011 in Germany and the Netherlands. Ireland would later arrive, through the acquisition of the Irish trading company Vayu Ltd., by now in 2016. In addition, in November of 2011, the company made its first LNG unloading at the Montoir-en-Bretagne terminal, as part of the concession to operate 1 bcm of natural gas in the period 2011-2021. In Portugal, Gas Natural Comercializadora started its gas selling activity in 2008.

As a result of the merger with Unión Fenosa, the important international deployment of this company was incorporated, in some cases in countries where it already operated — as has been noted — and in other cases in new countries, thus providing new possibilities and opportunities for growth and development in an increasingly global world.

In Central America, a significant position was established in Costa Rica, where it operated the 50 MW La Joya hydropower plant. In Panama, it operated the Metro-Oeste and Distribuidora Eléctrica de Chiriquí, with more than 20,300 kilometers

461. CNMV.GNF. Relevant fact. *Nota de prensa sobre contrato en Puerto Rico* (26-04-2012).

of networks and 33MW of installed power in hydraulic and fuel oil plants. The 106MW Palamara and 92MW La Vega thermal power plants in the Dominican Republic were also in operation.

Other electricity positions of Unión Fenosa in Nicaragua⁴⁶² and Guatemala were transferred, as well as EPSA in Colombia, while a position in telecommunications was maintained in Guatemala.

In Portugal, the electricity trading activities that Unión Fenosa Comercial had started in 2004 were transferred to Gas Natural Comercializadora in 2013; this gave rise to 15,000 electricity contracts active in that country.

In Europe, in addition to its position in Portugal, Unión Fenosa had a significant presence in the distribution of electricity in Moldova, which operated through the company Red Unión Fenosa, with 70% of the country being covered, mainly in the center and south, including the capital, Chisinau.

Unión Fenosa's interest in the development of its own gas chain was at the origin of its 80% stake in SEGAS, the owner of the Damietta liquefaction plant in Egypt, which began operations in 2004. The plant had a capacity of 7.6 bcm/year, of which the group itself had contracted 4.4 bcm. The investment exceeded 1 billion euros. Along the same lines, Unión Fenosa Gas took a 7.36% stake in the liquefaction plant in Qalhat, in the Sultanate of Oman, inaugurated in November of 2005. The plant had a capacity of 4.4 bcm/year, 50% of which was available to Unión Fenosa Gas, with a 20-year contract that began in 2006.

Finally, there were also investments in South Africa, with a stake started in 2007, representing 70% in Kangra Coal, owner of the Savmore coal mine in the Mpumalanga region, which produced 3 million tons/year and had an estimated coal and anthracite reserves of 160 million tons. In Kenya, the 109MW fuel oil-fired power plant Nairobi South was taken over. In Australia, there was a potential presence in the wind energy sector through Unión Fenosa Wind Australia Pty. Ltd., established in 2008, based in Sydney and with future developments in the states of Victoria and New South Wales.

Gas Natural Fenosa's intense activity in gas commercialization allowed the company to develop operations in Japan, Korea and India in those years; commercial relations with those countries were initiated with drive, a sign of the importance of the Asian markets in the future for the gas sector. An example of the importance of the actions is the signing in August of 2012 of an important supply

462. CNMV.GNF. Relevant fact. *Venta de activos en Nicaragua* (12-02-2013).

contract with Gail, India's main gas operator, for a quantity of 3 bcm/year of liquefied natural gas over three years, a relationship that began in January of 2013 and which also included an analysis of the possibilities for collaboration between the two companies on energy issues.⁴⁶³

It was possible to assess the importance of the international deployment described in numerous countries through the contribution of these activities to the company's ebitda as early as 2013, when it was estimated at 44.1% of the total.

The Electricity Rate Deficit

The electricity sector had a problem that was progressively worsening, known as the electricity rate deficit. This occurred as costs and subsidies were being charged to the electricity system, which, due to their magnitude, could not be included in the rates. This meant a progressive mismatch between revenue and expenditure of the system, which over time reached very significant levels.

The situation began in the first years of the 21st century, when, despite the cost increases, the government of the Partido Popular decided that the price of electricity could not exceed the CPI. However, the situation really worsened during the subsequent PSOE governments, when it was decided to heavily subsidize renewable energies from 2005 onwards. This produced a rate deficit in that year of over 4 billion euros, and the consequent knock-on effect that led to investments in renewables multiplying rapidly, seeking profitability that they would not have achieved in normal terms of competition. The situation improved somewhat in 2006 and 2007, but collapsed definitively from 2008 onwards, with significant annual figures accumulating and making the problem increasingly difficult to resolve.

However, the rapid development of renewables and the priority given to them in the pool meant that the installed electrical power in Spain exceeded 100,000 GWh, when at most 45,000 GWh were required at peak times. The technology prior to renewables, which were the combined cycle plants, began to have to reduce its hours of use very significantly, practically working as a back up of renewables, a situation aggravated by the subsidies and the priority given by the government of

463. CNMV.GNF. Relevant fact. *Nota de prensa sobre firma del contrato con compañía gasista Gail* (31-08-2012).

the PSOE to domestic coal, i.e., subsidies to both renewables and coal. Subsequent attempts to redress the situation and reduce the subsidies granted to renewables were immediately contested by this sector and by the national and international financial investors involved; no clear improvement in the situation was achieved, despite the limitation of equivalent prime operating hours for photovoltaic installations and the establishment of a generation fee.

The change of government at the end of 2011, with the return to power of the PP, represented a more important activism to try to solve or minimize the problem of the rate deficit, with a Royal Decree of January 27, 2012 that established the suspension of the procedures for pre-allocating remuneration and the elimination of economic incentives for new installations for the production of electricity from cogeneration, renewable energy and waste, in an attempt to halt the development of new installations that would have aggravated the problem. This provision was followed over the course of 2012 by various measures on the regulation of transport and distribution tolls, power guarantee, special cases of island and non-mainland electricity systems, etc.

But the main change, which initiated the beginning of the end of the rate deficit, was established with the agreements of the Consejo de Ministros of July 12, 2013. The government indicated that the measures taken in 2012 had been successful in reducing the projected 10.5 billion euros of additional rate deficit in 2013 to only 4.5 billion euros, and that they would be definitively eliminated with the measures that had been decided. The model allocated 2.7 billion to be assumed by the companies through changes in their remuneration; 900 million to be paid by the state, via the General Budget and the remaining 900 million to be borne by consumers, via increased rates.

The measures provided for the remuneration of electricity produced from renewables, cogeneration and waste to be based on the profitability of the ten-year Treasury bond plus 300 basis points; for rates the reference was also pegged to the ten-year Treasury bond plus 200 basis points. In addition, reductions were established in capacity payments for combined cycle plants, and adjustments in interruptibility, among other measures.

The legislative change culminated in Law 24/2013, of December 26, on the Electricity Sector, which replaced the previous framework of Law 54/1997, of November 27, which had introduced the progressive liberalization of the sector, but which had become obsolete due to the dynamics of events.

The Regulatory Review of Gas

In the case of gas, no problem of the magnitude of the electricity rate deficit arose, but in July of 2014 the government decided to undertake a revision of the regulatory framework by incorporating it into a Royal Decree-Law on measures to increase the efficiency of the Spanish economy after the years of economic crisis.⁴⁶⁴

The regulations then in force for the gas sector stemmed from the Hydrocarbons Law of 1988, which considered the sector to be of general economic interest, and established the bases of its economic regime, which were developed in detail by a Royal Decree in August of 2001.⁴⁶⁵ The rationale for the change was set by the government, which considered that the existing regime had worked well in the period 2002-2008, at a time of strong growth in demand for natural gas in the country, which had reached a peak of 449 TWh in 2008. However, subsequent reductions in consumption had meant that consumption levels in 2013 were at the 2004 level, and it was estimated that consumption in 2008 would not recover until after 2020.

This situation had resulted in the appearance of small mismatches between revenues and costs of the system from 2008 onwards, which were initially mitigated by a Royal Decree-Law in 2012⁴⁶⁶, but with an effect that was not sufficiently adequate for the continued situation of reduced consumption. The Comisión Nacional de los Mercados y la Competencia (National Commission on Markets and Competition) quantified that the mismatch could be estimated at 326 million euros by 2013, estimating that it could reach 800 million euros by 2014, which thus required immediate action.

464. Real Decreto-ley 8/2014, de 4 de julio, de aprobación de medidas urgentes para el crecimiento, la competitividad y la eficiencia (BOE, 5 de julio de 2014). (Royal Decree-Law 8/2014, of July 4, approving urgent measures for growth, competitiveness and efficiency (BOE, July 5, 2014).

465. Ley 34/1988, de 7 de octubre, del Sector de Hidrocarburos (BOE, 8 de octubre de 1991); Real Decreto 949/2001, de 3 de agosto, por el que se regula el acceso de terceros a las instalaciones gasísticas y se establece un sistema económico integrado del sector de gas natural (BOE, 7 de septiembre de 2001). (Law 34/1988, of October 7, on the Hydrocarbon Sector (BOE, October 8, 1991); Royal Decree 949/2001, of August 3, regulating third party access to gas facilities and establishing an integrated economic system for the natural gas sector (BOE, September 7, 2001).

466. Real Decreto-ley 13/2012, de 30 de marzo, por el que se transponen directivas en materia de mercados interiores de electricidad y gas y en materia de comunicaciones electrónicas, y por el que se adoptan medidas para la corrección de las desviaciones por desajustes entre los costes e ingresos de los sectores eléctrico y gasístico (BOE, 31 de marzo de 2012). (Royal Decree-Law 13/2012 of March 30, 2012 transposing directives on the internal market in electricity and gas and on electronic communications and adopting measures to correct discrepancies between the costs and revenues of the electricity and gas sectors (BOE, March 31, 2012).

The system established regulatory periods of 6 years, starting with the 2014-2020 period, for which remuneration for assets equivalent to that of the 10-year government bonds on the secondary market plus 50 basis points was recognized, which represented a total remuneration for the distribution of gas of 1,398.8 million euros by 2014.

Other components of the formulation were an efficiency variable that was not applied in the first year and additional payments for growth in both the number of customers and the associated consumption, which favored low consumption and new customers in newly gasified municipalities, to promote the extension of supply to new areas.⁴⁶⁷

Gas Natural Fenosa estimated that the new conditions would mean a reduction of 45 million euros in the remuneration for gas distribution in 2014. But the new framework began to function naturally; it established a stable framework with concrete figures for the first six years and stimuli for the growth of the sector. In 2017, there were various rumors about the possibility of a further review of the framework by 2020, and of possible cuts in established remuneration, with the corresponding immediate negative effect on the markets, but without major consequences.

Relations with Sonatrach and the Entry into the Medgaz

A very complex problem during the period 2007-2011 were the negotiations with Sonatrach on the price revisions that would be applied, from July 2005, to contracts that represented around 30 % of the company's supplies. Discussions began in 2007 and, after no agreement was reached, the Algerian side went to the Court of Arbitration in Paris, in accordance with the contractual provisions.

The situation became more complicated when the Court of Arbitration issued an award in August of 2010, concluding that Sonatrach was entitled to a price increase in gas supplies from January of 2007 of up to 1.4 billion euros until July of 2010. The company challenged the award before the Swiss Federal Court and obtained an interim stay of enforcement.

467. The established retributions were:

For supplies at a maximum pressure of 4 bar: €50 per customer in gasified municipalities; €70 per customer in newly gasified municipalities; €7.5/MWh for customers with annual consumption of 50 MWh or less; €4.5/MWh for customers over 50 MWh per year.

For supplies at a pressure between 4 and 60 bar: 1.25 €/MWh.

The complex situation was finally resolved with an agreement of June 14, 2011.⁴⁶⁸ 1,310 million euros for price discrepancies from January 1, 2007 to May 31, 2011; all price revisions for that period would be included in the figure. Gas Natural Fenosa had provided for the contingency in its financial statements in previous years.

The agreement served to settle the discussions, but also to establish a more robust collaboration between the two companies. It opened the way for “the possible acquisition by Sonatrach of a minority stake in Gas Natural Fenosa”, as well as for “the possible participation of Gas Natural Fenosa in various Sonatrach projects and in the joint development of other business opportunities”. A few days later, on June 17, 2011, the Board of Directors of Gas Natural Fenosa resolved to carry out a capital increase of 514.7 million euros, excluding the pre-emptive subscription right and represented by 38,183,600 new shares at a price of 13.48 euros per share, aimed at facilitating Sonatrach’s entry into the capital with a 3.85% stake, which did not involve representation on the Board. An important future-oriented alliance.⁴⁶⁹

Later, in the context of the new climate of the relationship, Sonatrach would facilitate the entry of Gas Natural Fenosa into the Medgaz gas pipeline. From the beginning, two routes had been studied for transporting gas from Algeria to Spain: one overland via Morocco and the Strait of Gibraltar and another undersea from Algeria directly to the Spanish coast. The first route had been taken by Naturgy, with the gas pipeline known as Maghreb-Europe, which had started operating in 1996. The moment for the second route was also now arriving.

Plans for the definitive underwater gas pipeline were set in February of 2001, when CEPSA and Sonatrach formed a joint venture called Medgaz to carry out the relevant feasibility studies. The project was not only to export gas to Spain, but also to Europe through Spain. Within five months, five top international energy companies had joined the project: BP, Endesa, ENI, Gaz de France and Total; Iberdrola would later replace ENI. The final endorsement came in 2003 when the European Commission included the project in the list of projects of priority interest within the energy sector.

Construction began in July of 2007, with a definitive route between Beni Saf, in Algeria, and Almería, in Spain, with a length of 210 kilometers and a maximum depth of more than 2,160 meters. The transport capacity was designed for

468. CNMV.GNF. Relevant fact. *Acuerdos Gas Natural Fenosa y Sonatrach* (14-06-2011).

469. CNMV.GNF. Relevant fact. *Aumento de capital* (17-06-2011).

8 bcm/year. In March of 2011, after completion of construction and testing, the gas pipeline was finally filled. Later, in 2012, Endesa and Iberdrola abandoned the project, while in January of 2013 Gas Natural Fenosa acquired 10% of the Medgaz from Sonatrach, with an associated supply contract of 0.8 bcm/year for a period of 18 years, starting in February of 2013.⁴⁷⁰ In addition, in July, 4.9% of the company was acquired from GDF Suez without gas associated.⁴⁷¹ In the end, the partners were: Sonatrach (43%), CEPSA (42%) and Gas Natural Fenosa (15%). This operation meant the current Naturgy was present in both gas pipelines from Algeria, the Maghreb-Europe as a majority partner, and Medgaz as minority one, thanks to the framework of proximity and new strategic relations with Sonatrach established in 2011.

The Cheniere Contract

One of the most relevant changes in the energy context at the beginning of the 21st century is the development of unconventional natural gas, also known as shale gas, obtained through hydraulic fracturing or 'fracking' techniques. The availability of this new gas has allowed world reserves at current consumption levels to be raised from 60 years to more than 200 years.

In the case of the United States, the country where the application of this type of retrieval technique was first developed, results were obtained that allowed us to imagine a new energy order, where the US economy would be clearly exporting instead of importing LNG, changing the geostrategic balance on a world scale of energy in general, and of natural gas in particular. The movement was of great significance. The April 2012 issue of the well-known magazine *Fortune* devoted its cover to the subject with the headline "The United States of Natural Gas", where it explained the impressive effect on prices: the historical price of natural gas in the period 2002-2011 had reached 5.78 dollars/million BTUs, while in the first months of 2012 it was below 2 dollars. A strict application of the law of supply and demand.

The International Energy Agency (IEA) itself, in its report *World Energy Outlook 2011*, with information for the period 2010-2035, entitled one of the headlines

470. CNMV.GNF. Relevant fact. *Compra participación 10% Medgaz (08-01-2013)*.

471. CNMV.GNF. Relevant fact. *Compra participación 4,9% Medgaz (30-07-2013)*.

of its executive summary: “The Golden Age of Gas”, and indicated that there was much less uncertainty about the prospects for natural gas than about oil: “On both the demand and supply sides, different factors indicate a bright future and even a golden age for natural gas”.

In Europe, the development of unconventional gas has encountered greater problems, both because of the reduced availability of gas and because of the legal definition of the subsoil, which belongs to the state and not to the owners of the surface land and, finally, because of the environmental sensitivity of citizens. However, in this context, if the new American price structure was not transferred to Europe, the competitiveness of European industry could be seriously affected.

In this situation, in November of 2011 Gas Natural Fenosa signed an unconventional natural gas supply contract with the American company Cheniere for 4.5 bcm per year with freedom of destination, enabling it to reinforce the international expansion of the Spanish company’s gas marketing business. LNG would come from the Sabine Pass terminal (Louisiana) from 2016 onwards, and the contract would have a duration of twenty years.

Cheniere, a Houston-based company, owned the Sabine Pass terminal, where it received LNG imports into the United States and was building a liquefaction plant to enable export; it had also initiated the project to build another terminal for export in Corpus Christi, Texas.

It was a very important contract, both for its volume and its origin in the United States, and for the freedom of destination of the gas clause, which allows Naturgy to take full advantage of its capacities and positioning in midstream operations, benefiting from its contracts, fleet and markets. Plans were made to dedicate four new ships and the existing 170,000 cubic meter *Ribera de Duero* to this contract. Before Gas Natural Fenosa, only the British company BG Group had signed a contract of this nature.

In June 2014, Gas Natural Fenosa, endlessly active in the international LNG markets, signed a second supply contract with Cheniere for 2 bcm of LNG per year, with freedom of global destination, from its future liquefaction plant in Corpus Christi, Texas. The contract is for 20 years and the first deliveries are scheduled for 2019. The two contracts would reach 6.5 bcm per annum, which represented approximately 20 % of the Spanish market’s consumption in those years.⁴⁷²

472. CNMV.GNF. Relevant fact. *Acuerdo con Cheniere* (02-06-2014).

The Museo del Gas

Naturgy's special sensitivity to society enabled it to set up a permanent exhibition — inaugurated in 1977 at the former headquarters of the Portal de l'Àngel de Barcelona — to explain the characteristics, uses and applications of natural gas as clean, efficient and environmentally friendly energy, its production and transport, together with the exhibition of an important collection of historical devices. In 1987, it also created a historical archive dedicated to the preservation and dissemination of the important heritage of documents and images conserved from more than a hundred years of history. As of 2004, these activities were entrusted to the Gas Natural Foundation, now the Naturgy Foundation.

When the company decided to build a new headquarters in Barceloneta, abandoning the one in Portal de l'Àngel, Chairman Antoni Brufau commissioned the Fundación to propose a change of scale that would allow the creation, out of respect for the existing events, of a true Museo del Gas (Gas Museum). A first-rate cultural facility, with the aim of being a reference point in Catalonia, Spain and Europe, which would let visitors enter the exciting world of energy by way of a modern and comprehensible vision, and to glimpse its future and its relationship with the environment, contributing knowledge and reflection and stimulating the interest of citizens and society. The museum was to present the history of a company, created in 1843. A company that, after 175 years, has shown itself to be a true top-level energy multinational, with a presence and activities in many countries and in different fields.

Located in Sabadell, the new Museo del Gas⁴⁷³ was designed and built in the period 2006-2011 by Dani Freixes / Varis Arquitectes, who teamed up with the foundation's experts. It opened its doors in December of 2011 and was formally inaugurated on January 10, 2012.⁴⁷⁴ The discourse on the past and future of energy was designed in permanent dialogue with the architecture of an appropriately restored modernist building and a building with a striking contemporary profile. Juli Batllellé's modernist building had been designed at the end of the 19th century to contain an electricity plant that functioned with gas engines, in a new conjunction of gas and electricity *avant la lettre*, in a clear premonition of the future.

473. Fàbregas (2012f), pp. 23-68.

474. Baztán (2012), pp. 6-11.

The tour of the Museo del Gas provided an insight into the importance of gas in the world, the history of the company, the relationship between gas and the society around it, and the tools of the future: energy and the environment. All this, from a sustainability perspective framed by the energy efficiency of the building itself with its leafy terrace. An essentially complete discourse that led to reflection, from the earliest roots to the paths of the future.

The Museo del Gas also housed the historical archive of the different companies that have been integrated to give rise to the current Naturgy, with more than 3,000 meters of shelving catalogued. It is one of the most important company archives in the country, which facilitates progress in research into the history of the gas and electricity industry⁴⁷⁵ and the preservation of the industry's historical memory.

In the course of 2016, the Museo Bolarque, created by Unión Fenosa in 1977 on the site of the historic power station, the first hydroelectric power plant of Unión Eléctrica Madrileña, was incorporated into the Naturgy Foundation, thus enriching the company's discourse of historic heritage preservation.

Good Governance and Corporate Responsibility

Naturgy is a long-standing company that has consistently known how to adapt, and that has often anticipated the advances of society and best business practices, managing to always maintain itself and its reputation at the highest levels. It is not surprising, therefore, to see its emphasis on the application of the principles of good governance and corporate responsibility, in a process that began at the end of the 20th century and has been constantly updated to the latest concepts of corporate compliance.

The company understands corporate responsibility as the actions taken to establish and maintain solid, mutually beneficial relationships of trust with its stakeholders. The stakeholders identified include: the people who make up the company, customers, suppliers and external collaborators, social groups,

475. In the field of research, the work of the *Cuadernos de Investigación Histórica de Catalana de Gas (Historical Research Notebooks of Catalana de Gas)* (1989-1991), with 26 published issues, and the *Biblioteca de Historia del Gas (Gas History Library)* (2006-2018), with ten books published so far, are noteworthy.

shareholders, investors and financiers, analysts, administrations and regulatory bodies, insurance and reinsurance agencies, and other market agents.⁴⁷⁶

The reference framework was established on the basis of the application of the principles of efficiency and transparency in decision-making, with an approach consistent with the main recommendations existing at international level, to promote “the proper management of the company’s operations and the improvement of its profitability”, making “an important contribution to the sustainable growth of the environment in which it operates”. Preventive risk management, the policy of corporate responsibility and internal control were basic elements, from the outset, of this policy to ensure adequate corporate compliance.

The commitment to corporate responsibility in the company is very strong, with the vision that: “Management from a corporate responsibility perspective generates value in the long term, in terms of creating trust in stakeholders and the legitimacy and social license necessary for the development of the activity. In addition, it builds an image of a sustainable company, which is committed to a new business model based on the generation of economic, social and environmental wealth [...]. In this sense, corporate responsibility makes it possible to formalize Gas Natural Fenosa’s commitment to society, and it becomes a competitive advantage and a critical element in ensuring the company’s sustainability”.

The last revision of the Corporate Responsibility Policy approved by the Board of Directors was carried out in 2015, and the defined policy updated on March 22, 2013. The principles of action of the corporate responsibility policy have been defined in eight areas: excellence in service, commitment to results, responsible management of the environment, interest in people, safety and health, responsible supply chain and, finally, integrity and transparency.

Naturgy’s actions in the area of good governance and corporate responsibility are therefore guided by principles, but also by an organization that follows compliance with the provisions and advocates their improvement, as well as complementary elements, such as an Ethical Code that all employees must be aware of and comply with, with the corresponding treatment mechanisms for interpretation or action in the event of non-compliance. The company also has a defined human rights policy, which is guided by due diligence, to minimize the risk of inappropriate behavior.

476. Gas Natural Fenosa (2016), *Informe de Responsabilidad Corporativa*, p. 94.

All of these elements reflect a philosophy of behavior and action that has made possible continuous recognition of the company, and it has obtained leadership in the Gas Utilities sector in the Dow Jones Sustainability Index (which includes companies around the world with the best practices in sustainability and corporate responsibility). The company has been listed on the DJSI World index for the past thirteen years without interruption and is also included in the DJSI Europe index.⁴⁷⁷ In 2017, Naturgy obtained the highest score in its sector in the following evaluation criteria: Codes of conduct, Information security and cyber security, Innovation management, Market opportunities, Responsible supply chain management, Climate strategy, Environmental reporting, Corporate citizenship and philanthropy, Human capital development, Human rights, Social communication and Attracting and retaining talent.

Naturgy also occupies prominent positions in other sustainability indices such as the FTSE4Good, in which it has been present since 2001, or in two variants of Vigeo (Euronext 120 and Eurozone 120), as well as in various MSCI classifications.

New Supplies, New Countries: Azerbaijan, Yamal, Peru

Limits were no longer an issue to the activity of a large multinational such as Gas Natural Fenosa and the company could not pause in its constant activity of weaving and unweaving new actions, new positions and new challenges.

And so, when the complexities of the environment advised it, in February of 2013, the company withdrew from electricity distribution in Nicaragua. And when, in July of the same year, a gas opportunity appeared in Peru, the steps were taken to obtain the award of tenders in the country. In Peru, it won the tender for the distribution of natural gas in four cities located in the southwestern part of the country: Arequipa — the second most important city in the country —, Moquegua, Tacna and Ilo, together with an area of more than 1.4 million inhabitants, with a 20-year concession. The area was far from the pipelines, so it was anticipated that the service would be carried out by transporting LNG from the natural gas liquefaction plant in Peru.⁴⁷⁸

477. GNF. Press release. *Gas Natural Fenosa obtiene el liderazgo en el sector gas utilities del índice de sostenibilidad DJSI* (08-09-2017).

478. CNMV.GNF. Relevant fact. *Adjudicación en Perú* (25-07-2013).

The diversification of natural gas supplies also required attention as a permanent matter. The importance of Algeria was, and is, evident. Its geographical proximity was one conditioning factor, and the good relations with Sonatrach helped, but the roads of the future demanded opening up new possibilities, such as the one already subscribed with the American company Cheniere. In this context of new opportunities, two other projects emerged: Azerbaijan and Yamal.

On September 19, 2013, Gas Natural Fenosa signed a contract with the ShahDeniz consortium of Azerbaijan to supply 1 bcm/year of natural gas from the second phase of the ShahDeniz field, with a duration of 25 years; deliveries were expected to start in 2019 in southern Italy, where the group managed the distribution of natural gas. The transport would take place along the so-called Southern Corridor, with a gas pipeline connecting Azerbaijan with Europe, through Georgia, Turkey, Greece, Albania and an underwater section that would cross the Adriatic to southern Italy. The TANAP (trans-Anatolian gas pipeline), which is expected to transport 16 bcm/year, is one of the alternatives for natural gas from the Caspian area to reach the European Union without having to cross the territory of either Russia or Ukraine, and thus opens up a new possibility of great geostrategic value. The agreement with Azerbaijan associated with the supply of Italy is part of the sale of the business in Italy agreed in October of 2017, which will be explained below.

The Yamal project consists of a contract for the supply of LNG from the South-Tambeyskoye field, located on the Yamal peninsula, bathed by the Arctic Ocean in northwestern Siberia. The contract is for 3.2 bcm/year for a period of 23 years. The special value of the contract was that it was the first to be signed by Gas Natural Fenosa in its entire history with Russia, although with the important characteristic that the gas would be supplied as LNG, and an in situ liquefaction plant would be built, which meant avoiding the classic problems between Russia and the transit countries to reach Western Europe. Moreover, Spain had a large number of terminals for receiving LNG tankers, and the then Gas Natural Fenosa was already one of the world's leading LNG operators and was capable of optimizing supplies and destinations with high flexibility. The plant in Siberia was to be built and operated by Yamal GNL, the company that inaugurated the plant on December 8, 2017, after an investment of 24.1 billion euros, and whose shareholders are the Russian company Novatek (50.1%), the Chinese company CNPC (20%), the French company CNPC (20%), the French company Total (20%), and the Chinese state-owned Silk Road Fund (9.9%).⁴⁷⁹

479. *La Vanguardia*, December 9, 2017.

During these years, other projects were also developed, such as the 50 MW Torito hydroelectric plant in Costa Rica, which consolidated the company as the first private generator in the country. Also the Bií Hioxo project in Mexico for wind power generation, with 234 MW, which came into operation in 2014.

But as always, a great and important effort was based on organic growth. The perimeter of the company was already large enough to allow it to permanently develop important opportunities to increase its activity with the available human, technological and financial resources.

Organization of Electricity Generation and the Creation of Global Power Generation

After a few years of the merger process that gave rise to Gas Natural Fenosa, it was decided to reorganize the electricity generation activity with the aim of rationalizing the group's business structure and separating business risks, optimizing management, concentrating responsibilities and specializing business units. This led to the creation of two new companies: Gas Natural Fenosa Generación, SLU, for the assets in Spain and, shortly afterwards, Global Power Generation, for international assets.

On January 31, 2014, the Board signed the project for the segregation of the non-nuclear hydroelectric and thermal generation assets in Spain, in a new company called Gas Natural Fenosa Generación, SLU, which would incorporate the coal, gas and fuel oil generation plants as well as the hydraulic ones, both from the former Gas Natural SDG and from Unión Fenosa. The value of the assets transferred was valued at 3,535 million euros; the new company had a share capital of 500 million euros.⁴⁸⁰ Fiscally, the transaction was designed as a non-monetary contribution of a branch of activity.

Later, in 2015, the nuclear generation assets in Spain were added to the existing company, and the Board approved, on January 30, 2015, the appropriate segregation and incorporation. In this case, the value of the transferred assets was appraised at 361 million euros, increasing the share capital by 52 million euros. With all this, Gas Natural Fenosa Generación, SLU became the owner and manager of

480. CNMV.GNF. Relevant fact. *Reorganización negocio generación electricidad en España* (31-01-2014).

all the company's conventional power generation in Spain⁴⁸¹, thereby culminating the unity of action.⁴⁸² Renewable power generation in Spain would be situated in another company: Gas Natural Fenosa Renovables.

On an international scale, where the possibilities of finding growth opportunities for new installations were important and where the markets of other countries could be opened, mainly in Latin America and Asia, it was decided to create a new company, Global Power Generation (GPG), grouping all the existing international assets in both conventional and renewable generation. This company was designed to cover the entire value chain of the generation industry, i.e. development, engineering and construction projects, as well as the management and operation of existing assets, and this, virtually anywhere in the world.⁴⁸³ An ambitious challenge and a great project.

GPG was created in October of 2014, with 800 professionals, with 2,852 MW in operation, 284 MW under construction and a portfolio of 850 MW in development. Initially, it integrated the group's generation assets into:

- Mexico: Four combined cycle plants and the Bii Hioxo wind farm.
- Costa Rica: La Joya and Torito hydraulic power plants.
- Puerto Rico: Combined cycle plant.
- Dominican Republic: Thermal power plant.
- Panama: Hydroelectric power plant and thermal power plant.
- Kenya: Thermal power plant.
- Australia: Wind projects under development.

A few months later, on March 30, 2015, the new company received significant support when it entered the Kuwait Investment Authority (KIA) through Wren House Infrastructure, which obtained a 25 % stake through a dedicated capital

481. CNMV.GNF. Relevant fact. *Segregación a favor de Gas Natural Fenosa Generación SLU* (30-01-2015).

482. Also at that time, the 44.9% stake in Barras Eléctricas Galaico Asturianas (BEGASA) was sold to its other shareholder, Viesgo, for 97 million euros. Relevant fact. *Acuerdo venta participación BEGASA* (29-06-2015). Although it was a minor operation, and in the area of distribution, historically it had a lot of content, was the electricity distributor created in 1931, based in Lugo, which had 170,000 supply points and more than 9,000 kilometers of network in 2015. Electra de Viesgo's entry into Lugo in the 1930s, as has been explained in the discussion of the Sociedad General Gallega de Electricidad, disturbed the Galician electricity system, forcing Fenosa to be created after the Civil War.

483. GNF. Press release. *Gas Natural Fenosa crea la sociedad Global Power Generation para impulsar su negocio de generación internacional* (01-10-2014).

increase of \$550 million. This provided significant financial support from a large investor to accelerate the development of new projects.⁴⁸⁴

The Kuwait Investment Authority is the oldest sovereign wealth fund in the world, created in 1953 by the Kuwait Investment Board, which is responsible for the management and administration of the Kuwait State Fund, Kuwait's General Reserve Fund (GRF) and the Future Generation Fund (FGF), among other funds. Wren House Infrastructure was created by KIA in 2013 to manage all its infrastructure investments.

The search for new GPG projects began to bear fruit in 2016, with awards in Chile, Australia and Brazil, all of them renewable energies (wind and solar). In Chile, GPG submitted a bid at the 2015/01 supply tender for a total of 12,350 GWh for regulated customers (households and SMEs) of the Chilean government, and was awarded, in August of 2016, 858 GWh of electricity per year, approximately 7% of the total. The energy was to be produced with a mix of wind and solar energy, with the Cabo Leones II wind farm (204 MW) and a photovoltaic solar plant (120 MW). The planned investment amounted to 325 million euros.⁴⁸⁵

In the same month of August of 2016, just five days later, GPG won its first contract in Australia, with 91 MW of power in a wind-power project located in the state of New South Wales, within the Australian Capital Territory, some 90 kilometers from Canberra, the capital city of the country. The 20-year, regulated tariff contract led to the construction of the Crookwell II wind farm and other associated investments, valued at 120 million euros, with the aim of starting operations in the second half of 2018.⁴⁸⁶

In December of 2016, a first project was achieved in Brazil, when GPG agreed to acquire an 85% stake in two plants from the Grupo Gransolar, the Sobral I and Sertao I solar farms, located in the Piauí region in the north of the country. The planned investment amounted to 85 million euros for the development of the wind farms, and the installation of a power of 68 MWp (60 MW), for the supply of 154 GWh per year to the Brazilian public electricity system for 20 years at a price of approximately 95 €/MWh. The plants went into operation in 2017.⁴⁸⁷

484. CNMV.GNF. Relevant fact. *Acuerdo con Kuwait Investment Authority* (30-03-2015).

485. CNMV.GNF. Relevant fact. *Adjudicación de un contrato de 858 GWh en Chile* (18-08-2016).

486. CNMV.GNF. Relevant fact. *Adjudicación parque eólico en Australia* (23-08-2016).

487. GNF. Press release. *Gas Natural Fenosa, a través de su filial GPG, adquiere su primer proyecto de generación eléctrica en Brasil, de 68 MWp* (02-11-2016). MWp (megawatt peak) is used in photovoltaic solar energy to refer to the nominal power of a unit.

Later, on March 19, 2018, GPG decided to acquire two photovoltaic solar plants from Canadian Solar Inc. in Brazil, called Guimaranía I and Guimaranía II, located in the state of Minas Gerais. The planned investment amounted to 95 million euros for the development of the 83 MWp wind farms, for the supply of 165 GWh per year to the Brazilian public electricity system for 20 years at a price of approximately 97.5 €/MWh. Commissioning was planned for the end of 2018.⁴⁸⁸

To conclude, in the four years since its creation, the existing plants were managed in the international context, and new projects were established in Chile, Australia and Brazil. In this way, the expectations created in the corresponding strategic plans were exceeded, with clear advances in photovoltaic and wind power. New paths for the future.

Chile: The Compañía General de Electricidad and Gasco

In 2014, a new and important growth operation in Latin America was finally achieved through the acquisition of Compañía General de Electricidad, S.A. in Chile, which was the head of an important group present in electricity, natural gas, LNG and LPG activities in Chile, but also with activities in Argentina and Colombia. It was a significant commitment, the investment exceeded 2.5 billion euros, and included 4.5 million customers. Chile was a country that sooner or later had to be reached because of the modernity of its society and economy, and the stability of its political frameworks after the upheavals of previous stages. Gas Natural Fenosa's new gas and electricity competencies could be applied there with good growth and profitability expectations, as it acquired the leading gas and electricity company in Chile, and reaffirmed its clear positioning in Latin America.

Acquisition and Reorganization Operations (2014-2016)

On October 11, 2014, Gas Natural Fenosa announced that it had reached an agreement with the majority shareholders of Compañía General de Electricidad de Chile, which were Grupo Familia Marín, Grupo Almería and Grupo Familia Pérez Cruz, and which together represented 54.19% of the share capital. The agreement provided that Gas Natural Fenosa would make a takeover bid for the entire share

488. CNMV.GNF. Relevant fact. *Acuerdo adquisición dos proyectos fotovoltaicos solares en Brasil (19-03-2018)*.

Table 59. Compañía General de Electricidad. Customers (2013)

	Total	Chile	Argentina
Electricity	3,427,037	2,571,753	855,284
Natural gas	1,166,333	692,135	474,198
TOTAL	4,593,370	3,263,888	1,329,482

Source: Compañía General de Electricidad, *Memoria* 2013.

capital of the company and that the majority shareholders would take part in it. The terms of the takeover bid were a price of 4,700 Chilean pesos per share, paid in cash in full, and the offer was to be accepted for a minimum of 51% of the share capital.⁴⁸⁹

The takeover bid was launched on October 11 and closed on November 14, 2014 with great success and the acceptance of 96.5% of the share capital, representing an investment of approximately 2,550 million euros.⁴⁹⁰

The Compañía General de Electricidad was an important corporate conglomerate that, at the end of 2013, was present, among other sectors, in the distribution of electricity in Chile, mainly in the Arica and Parinacota regions, in the Araucanía region, in part of the Metropolitan region and in the Magallanes region, with sales of 12,887 GWh. It also distributed electricity in Argentina, in the provinces of San Juan, Tucumán and Jujuy, with sales of 5,389 GWh. It also carried out activities in transport and generation of electricity.

In the natural gas sector, distribution and transportation activities were carried out through Gasco and its subsidiaries in four regions of Chile and four provinces of Argentina. In Chile, it operated via Metrogas, in the Metropolitan region and in the Libertador General Bernardo O'Higgins region; with the companies Gas Sur and Innergy Holdings in the Bío Bío region, and finally, in the Magallanes region through the Gasco Magallanes business unit. In Argentina, the action was focused on the northwest, with the companies Gasnor and Gasmarket. In addition, gas transportation activities were carried out through Gasco's subsidiaries (Table 59).

The importance of Compañía General de Electricidad and Gasco could also be assessed by its position in the market, as it was the largest distributor of both

489. CNMV.GN. Relevant fact. *Operación compra en Chile* (12-10-2014), y *Presentación adquisición Chile* (13-10-2014).

490. CNMV.GN. Relevant fact. *Resultado oferta pública de adquisición de acciones sobre CGE* (14-11-2014).

electricity and gas in Chile, with more than 4.5 million customers. The position in the LPG market was also relevant: it represented 27.2% of the Chilean market, and 21% of the Colombian market for this energy. By 2013, its sales revenue amounted to \$3,862 million, while the ebitda reached \$743 million.⁴⁹¹

The great importance of the acquisition was made clear by the immediate appointment, before the end of 2014, of the then CEO of Gas Natural Fenosa, Rafael Villaseca Marco, as the new chairman of Compañía General de Electricidad, and on May 1, 2015, of Antonio Gallart Gabás as managing director of the company.⁴⁹² Later, in 2016, Antonio Gallart would be appointed chairman of the company. The circle was closing.

The design of the strategy for the group's new business involved maintaining its electricity activities and separating its natural gas activities from those related to LPG, integrating the former and transferring the latter. On the other hand, the disposal of the Quintero terminal was proposed, separating it from the LNG plant business, in accordance with the strategic line of the group, which will be explained in an ensuing section. The design was completed in 2015 and implemented in 2016.

On December 18, 2015, Gas Natural Fenosa announced that it had reached an agreement with the Pérez Cruz family to restructure the natural gas and LPG activities of Gasco, S.A. (Gasco) into two companies, one dedicated to natural gas under the name Gasco GN (later Gas Natural Chile, S.A.), and the other dedicated to LPG, which would remain Gasco, S.A. At the time, Gasco's shareholding structure consisted of 57% of Compañía General de Electricidad, 22% of the Pérez Cruz family, and the remaining 21% as free float; the company was listed on the Santiago stock exchange.⁴⁹³

The commitment contemplated the presentation, during 2016, of cross take-over bids by Gas Natural Fenosa Chile for all the shares of Gas Natural Chile, and by the Pérez Cruz family for all the shares of Gasco, S.A. The public offerings were submitted on July 6, 2016: Gas Natural Fenosa Chile offered 3,511 Chilean pesos per share of Gas Natural Chile, while the Pérez Cruz group offered 1,684 Chilean pesos per share of Gasco, S.A.⁴⁹⁴ The results of the operations were satisfactory and allowed Gas Natural Fenosa to divest its LPG business, recover 220 million euros

491. Compañía General de Electricidad, *Memoria 2013*.

492. Antonio Gallart was until then the general manager of Resources of Gas Natural Fenosa.

493. CNMV.GNF. Relevant fact. *Reestructuración en Chile* (18-12-2015).

494. CNMV.GNF. Relevant fact. *Opa Gas Natural Chile* (06-07-2016).

from its indirect stake in Gasco, S.A. and, at the same time, reach 94.5% of Gas Natural Chile's capital, investing an additional 306 million euros. It thus became the majority shareholder in the group's natural gas activities.⁴⁹⁵

The Compañía General de Electricidad (1905-2014) and Gasco (1856-2014)

The Compañía General de Electricidad was created in Santiago more than a hundred years ago, in 1905, under the name Compañía General de Electricidad Industrial with the purpose of supplying electricity. It began its activities in San Bernardo, Rancagua and Temuco. The following years saw organic growth both in terms of the extent of its activity and in terms of various acquisitions of other electricity companies, as it progressively integrated its activity over increasingly larger geographical areas.⁴⁹⁶

The award of Gasco in 1977 in the tender called by its owner, the Corporación de Fomento de la Producción (Corfo)⁴⁹⁷, allowed the group of the Compañía General de Electricidad to enter the historical sector of city gas, which would later make it possible to have an active presence in the field of natural gas.

Gasco was a company with a long history, being among the oldest gas companies in the world still existing at that time. In Chile, gas lighting was introduced by José Tomás de Urmeneta and Maximiano Errázuriz Valdivieso⁴⁹⁸; in 1856, they obtained the Santiago concession and inaugurated the service on September 17, 1857.⁴⁹⁹ Chile was the second country in South America to implement this advance after Argentina (1852); it was fifteen years behind Spain (1842-1857). The company was transformed into a public limited company in 1865 under the name of Compañía del Gas de Santiago; it received its definitive name of Compañía de Consumidores de Gas de Santiago (Gasco) in 1887, and developed a growing activity

495. CNMV.GNF. Relevant fact. *Resultado Opa GN Chile* (08-08-2016).

496. On the history of Compañía General de Electricidad, see: Nazer, Couyoumdjian, Camus (2005).

497. Corfo is the agency of the government of Chile, under the Ministerio Economía, Fomento y Turismo, created to support entrepreneurship, innovation and competitiveness in the country and strengthen human capital and technological capabilities.

498. José Tomás de Urmeneta was a Chilean businessman and politician of Basque origin who had been trained in the United States and had worked intensely in copper mining, making him a millionaire. He was a member of the Chamber of Senators (1855-1864) and the Chamber of Deputies (1846-1849 and 1852-1855), as well as of the Council of State. Maximiano Errázuriz, also of very high financial standing, had married Amalia Urmeneta, daughter of José Tomás de Urmeneta, in 1855.

499. On the history of Gasco, see: Nazer and Martínez (1996).

in gas lighting and the subsequent progressive transformation towards other uses, taking advantage of the thermal capacity of gas, and initiating and maintaining competition with other energies. Since 1956 it has also been active in the distribution of LPG in its market. In 1972 the controlling stock of the company (54.6%) was acquired by the state agency Corfo, which, after a few years, in 1977, transferred it to the Compañía General de Electricidad.

The following years were marked by years of growth and entry into new activities and new territories for Compañía General de Electricidad and its subsidiary Gasco:

- **1992.** Gasco formed Gasmar to build the LNG regasification plant in Quintero.
- **1992.** Gasco began the distribution of natural gas in Argentina.
- **1995.** Compañía General de Electricidad began electricity distribution in Argentina.
- **1995.** Gasco formed Metrogas, to which it transferred the assets and operations related to the city gas.
- **1997.** The distribution of natural gas from Argentina began in Chile.
- **2000.** Gasco took control of Metrogas when it reached a 51.84% stake.
- **2006.** Gasco transferred the LPG assets and business activities to Gasco LPG.
- **2009.** The Quintero terminal was inaugurated and the dependence on natural gas imports from Argentina was eliminated. Quintero was the first LNG terminal in the southern hemisphere.
- **2010.** LPG distribution began in Colombia, through the acquisition of 70% of Inversiones GLP SAS ESP.

In short, over the years, the historic group had gradually asserted its position in electricity, natural gas, LNG and LPG in Chile and other South American countries.

The Strategy with LNG Terminals

In the reorganization of the assets of Compañía General de Electricidad in Chile in June of 2016, an agreement was reached for the sale of Gas Natural Fenosa's indirect stake in the Quintero LNG terminal. The 20% stake was held through Aproveionadora Global de Energía, S.A., a company split off from Metrogas, S.A. (in which Gas Natural Fenosa held a controlling stake of 60.2%). The buyer was

Enagás Chile SpA for a value of 175 million euros, which produced a net capital gain of 50 million euros in Gas Natural Fenosa. The operation, once the appropriate authorizations had been obtained, was carried out in November of 2016.⁵⁰⁰

The operation was announced on the same day as the sale of the 42.5% stake in the Sagunto terminal in Spain, managed by SAGGAS, also to Enagás, for 106 million euros. It continued with the line started in February of 2016, when the Mugardos plant in Galicia, managed by Reganosa, was disinvested, and in which the group held an 18.9% stake through Unión Fenosa Gas. In Reganosa the buyers were the Xunta de Galicia and the Tojeiro Group.⁵⁰¹

It should be remembered that Naturgy had built the first LNG terminal in Spain in Barcelona, which marked the beginning of the natural gas era in the country; the terminal was then transferred to Enagás, and was recovered when Gas Natural acquired 100% of the latter company together with the Huelva and Cartagena plants. Subsequently, when the Enagás shares were sold with the liberalization of the sector, the group was left without any of its own terminals. The merger with Unión Fenosa contributed the shares in the regasification terminals at Sagunto and Mugardos in Spain and the Damietta liquefaction terminal in Egypt. Subsequently, the acquisition in Chile contributed that of Quintero. With the operations carried out in 2016, Gas Natural Fenosa abandoned its LNG regasification plant activity.

The liquefaction plant in Damietta at that time was on hold and in litigation since 2014, when the natural gas supplier, Egyptian Natural Gas Holding (EGAS) — an Egyptian state company — had stopped supplying gas to Unión Fenosa Gas, a company owned 50% by Gas Natural Fenosa, and had stopped paying the fee for the use of the Damietta liquefaction plant. These circumstances, arising from the political and social context in which Egypt was experiencing at the time, led Unión Fenosa Gas to file various claims in arbitration (Madrid, Cairo and ICSID) against the supplier, which requested the annulment of the contract, and against the Arab Republic of Egypt.⁵⁰²

500. CNMV.GNF. Relevant fact. *Venta participación planta de GNL de Quintero (30-06-2016), y Cierre de la venta de la participación de Quintero a Enagás (08-11-2016)*.

501. Enagás. Press release. *Enagás acuerda incrementar su participación en las plantas de regasificación de Sagunto al 72,5% y GNL Quintero (Chile) al 60,4% (30-06-2016)*, and Unión Fenosa Gas. Press release. *Unión Fenosa Gas sale del accionariado de Reganosa (08-02-2016)*.

502. Gas Natural Fenosa. *Memoria 2017*.

In short, by the end of 2016 the company's activity as shareholder of LNG plants had practically disappeared. The multiplicity of plants, the separation of plant ownership and gas supply contracts, and the transformation of the use of the terminals into a strictly competitive business activity, led to the conclusion that it was better to divest and free up resources in line with the capital optimization strategy within the framework of proactive asset portfolio management.

2016-2018

Recent Years:
New Shareholders

From 2016 onwards, a new phase began, with a significant change and evolution of the main shareholders, a structure that had remained basically stable since 1991, a long period of 25 years.

The presentation on May 11, 2016 of Gas Natural Fenosa's strategy, the *Visión Estratégica 2016-2020* (Strategic Vision 2016-2020), foresaw a few years in which the global macroeconomic and energy environment would evolve with:

- A growth in global energy demand, basically due to the drive of emerging markets.
- An evolution of the electricity generation mix towards renewables and gas, as a result of global initiatives to combat climate change.
- And a progressive appearance of new business models in the energy sector, due to the development of distributed generation models, Smart grids and Smart applications.

The main pillars of the plan were a solid and continuous cash flow generation that sustained future dividends, accompanied by strict financial discipline, all of which was optimized with a plan to constantly seek improvements in the efficiencies achieved, with a focus more on customers than on processes and, finally, a dynamic portfolio management.

However, the evolution of the energy landscape, the entry of new shareholders and changes in the chairmanship and governance of Naturgy have adapted the strategy and action to new challenges and new paths for the future.

Shareholders and Board of Directors

In the summer of 2016, the shareholding situation continued to be very stable as it had been for the last 25 years, ever since “la Caixa” and Repsol pooled their interests to form Gas Natural SDG through the merger of Catalana de Gas and Gas Madrid in the early 1990s. The main difference had occurred years before in Repsol, when “la Caixa” took a major stake in the company, making it the largest shareholder of the oil company and was thus able to appoint the chairman of the company in 2004.

CriteriaCaixa had a 34.4% stake and the Repsol Group had a 30.1% stake. As a third shareholder, Sonatrach already had a 4% stake, but this was a sizeable distance from the main shareholders. The remaining 31.5% of the shares were distributed among multiple shareholders (Table 60).

Table 60. Gas Natural Fenosa. Board of Directors (2013)

Name	Position
Salvador Gabarró Serra	Chairman
Antoni Brufau Niubó	Vice-President
Rafael Villaseca Marco	CEO
Ramón Adell Ramón	Member of the Board
Enrique Alcántara-García Irazoqui	Member of the Board
Xavier Añoveros Trías de Bes	Member of the Board
Demetrio Carceller Arce	Member of the Board
Santiago Cobo	Member of the Board
Nemesio Fernández-Cuesta Luca de Tena	Member of the Board
Felipe González Márquez	Member of the Board
Emiliano López Achurra	Member of the Board
Carlos Losada Marrodán	Member of the Board
Juan María Nin Génova	Member of the Board
Heribet Padrol Munté	Member of the Board
Juan Rosell Lastortras	Member of the Board
Luis Suárez de Lezo Mantilla	Member of the Board
Miguel Valls Maseda	Member of the Board
Manuel García Cobaleda	Non-Board Secretary

Source: Gas Natural Fenosa. *Memoria 2013*.

As a result of the share capital structure, the Board of Directors was made up of seventeen directors, five appointed by “la Caixa”, five by Repsol and seven independent directors.

Global Infrastructure Partners: Participation Agreements

The change began on September 12, 2016 when “la Caixa”, through CriteriaCaixa, and Repsol announced that they had reached an agreement with GIP III Canary 1 S.à.r.l. (GIP), a company controlled by Global Infrastructure Management LLC, to each sell it a 10% stake in the share capital of Gas Natural Fenosa for 1.9 billion euros. The transaction represented a GIP investment of 3.8 billion euros to obtain

a 20% stake in the company. CriteriaCaixa obtained a capital gain of 218 million euros and Repsol a capital gain of 246 million.⁵⁰³

Global Infrastructure Partners, the new shareholder's parent company, was an independent infrastructure fund manager from the United States, which combined in-depth industry expertise with best practices in operational management. Its strategy was based on an investment profile geared towards large-scale investments in assets that provided essential services, with high entry barriers and mainly in OECD countries, initiated operations with business owners and maintained prudent leverage.⁵⁰⁴

In the context of the transaction, Repsol and CriteriaCaixa relinquished the shareholders' agreement of January 11, 2000 governing their mutual actions, which had been updated on May 16, 2002, December 16, 2002 and June 20, 2003.

CriteriaCaixa and Repsol also entered into agreements and commitments with GIP regarding the governance of Gas Natural Fenosa, which were assumed by its Board of Directors, acting as a suspensive condition until their effective implementation, and which basically included the following proposals:

- As long as the Board has 17 members and the shares resulting from this operation, the posts should be appointed at the proposal of Criteria CaixaCorpixa (4 posts), Repsol (3 posts) and GIP (3 posts), including 6 independent board members and one executive member (the CEO).
- That the non-executive chairmanship would be held by CriteriaCaixa, and the two non-executive vice-presidents, one by Repsol and the other by GIP.
- That the Executive Committee would have 10 members: CriteriaCaixa (2), Repsol (2), GIP (2), independent (3) and one executive director. Also included were provisions on the Audit Committee and the Remuneration Committee.

The agreement established that the appointment agreements did not imply concerted action by the signatories. It provided that if one of the parties reduced by 10 or more percentage points the share existing at the time of this transaction, it would be excluded from the contract, which would remain between the remaining parties. The ownership interests after the transaction were established at CriteriaCaixa 24.439%, Repsol 20.083% and GIP 20.00%.

503. CNMV.REPSOL. Relevant fact. *Acuerdo de venta de un 10% del capital social de Gas Natural SDG, S.A. a GIP III Canary I S.à. r.l.* (12-09-2016).

504. Summary from the section *What We Do* from the web of Global Infrastructure Partners. See global-infra.com [consulted 29-03-2018].

Finally, the Board Regulations were also amended; a two-thirds enhanced majority was established for certain decisions, such as the acquisition or disposal of significant assets, the approval of the budget and the strategic plan, the modification of the dividend policy or the signing or amendment of material contracts.

The agreements between “la Caixa” and Repsol with GIP were implemented at the meeting of the Board of Directors on September 21, 2016, with the adaptation of its members and the ratification of the agreements envisaged.⁵⁰⁵ A very important point was the replacement of Salvador Gabarró as chairman, and the appointment of Isidro Fainé, then chairman of the Fundación Bancaria “la Caixa”, and of CriteríaCaixa, who had a longstanding relationship with the company. The planned vice-presidents were also appointed and the Executive Committee and the other Committees were adapted: Ramón Adell was chairman of the Audit Committee; Francisco Belil, of the Appointments and Remuneration Committee, and Rafael Villaseca continued to serve as CEO, but in his capacity as executive officer⁵⁰⁶ (Table 61)

Isidro Fainé, New Chairman

The new chairman was a person who had a long relationship with the company, having been one of the first board members to be appointed to the Board of Directors of Catalana de Gas by “la Caixa” at the beginning of its participation in 1989. In addition, in May of 2015, he had been re-appointed as a member of the Board representing CriteríaCaixa.

Isidro Fainé was at the time chairman of the Fundación Bancaria “la Caixa” and of CriteríaCaixa, as well as senior vice-president of Repsol, vice-president of Telefónica and board member of Banco BPI, The Bank of East Asia and Suez Environment Company. In addition, he was chairman of the European Savings Group (ESBG), and vice-president of the World Savings Banks Institute (WSBI). He had also been the founder of the Spanish Chapter of the Club of Rome and of the Círculo Financiero (Financial Circle), as well as of the Confederación Española de Directivos y Ejecutivos (Spanish Confederation of Directors and Executives) (CEDE), which he also presided over.⁵⁰⁷

505. CNMV.GNF. Relevant fact. *Acuerdos Consejo de Administración* (21-09-2016).

506. This Board of Directors would remain unchanged until early 2018.

507. GNF. Press release. *El Consejo de Administración de Gas Natural Fenosa nombra presidente a Isidro Fainé en sustitución de Salvador Gabarró* (21-09-2016).

Table 61. Gas Natural Fenosa. Board of Directors (21-09-2016)

Name	Position	Representation
Isidro Fainé Casas	Chairman	Proprietary (CriteriaCaixa)
Josu Jon Imaz San Miguel	1 st Vice-President	Proprietary (Repsol)
William A. Woodburn	2 nd Vice-President	Proprietary (GIP)
Rafael Villaseca Marco	CEO	Executive
Enrique Alcántara-García Irazoqui	Member of the Board	Proprietary (CriteriaCaixa)
Marcelino Armenter Vidal	Member of the Board	Proprietary (CriteriaCaixa)
Alejandro García-Bragado Dalmau	Member of the Board	Proprietary (CriteriaCaixa)
Luis Suarez de Lezo Mantilla	Member of the Board	Proprietary (Repsol)
Miguel Martínez San Martín	Member of the Board	Proprietary (Repsol)
Rajaram Rao	Member of the Board	Proprietary (Repsol)
Mario Armero	Member of the Board	Proprietary (Repsol)
Benita María Ferrero-Waldner	Member of the Board	Independent
Cristina Garmendia Mendizábal	Member of the Board	Independent
Helena Herrero Starkie	Member of the Board	Independent
Xabier Añoveros Trías de Bes	Member of the Board	Independent
Francisco Belil Creixell	Member of the Board	Independent
Ramón Adell Ramón	Member of the Board	Independent

Source: CNMV.GNF. Relevant fact. *Acuerdos Consejo de Administración* (21-09-2016).

Born in Manresa (Barcelona) in 1942, he holds a PhD in Economics, an ISMP in Business Administration from Harvard University and a diploma in Senior Management from IESE. He is also a member of the Real Academia de Ciencias Económicas y Financieras (Royal Academy of Economic and Financial Sciences) and the Real Academia de Doctores (Royal Academy of Doctors).

Isidro Fainé's professional career has always been linked to banking. He began as the investment manager of the Banco Atlántico (1964); later, he was appointed managing director of the Banco de Asunción in Paraguay (1969), and returned to Barcelona as personnel manager of the Banca Riva y García (1973); director and managing director of the Banca Jover (1974), and managing director of the Banco Unión (1978). He joined "la Caixa" in 1982 as deputy managing director, and progressively ascended: he was deputy executive managing director (1991) and

managing director from 1999 onwards, before finally being appointed chairman of the bank in 2007, until its transformation into Fundación Bancaria “la Caixa” in 2014. He has also served on the Board of CaixaBank since 2000, and was its chairman for the period 2009-2016.

A person with a great reputation, of high professionalism and a fine analyst of reality, possessing extraordinary vision and sensitivity, Fainé was perhaps the most suitable option for the new stage of Gas Natural Fenosa, which also required a non-executive chairman, with new partners, new styles and new strategies.

Chairman Fainé replaced Salvador Gabarró, who had held the post since October of 2004, a significant period of change, a man who was always affable toward others. The period of Gabarró’s tenure had been years of transformation, of the change from a gas company to a vertically integrated multinational energy group. In 2009, he oversaw the merger with Unión Fenosa, and achieved the integration of gas and electricity into a single company, an objective it had sought for so many years. During his tenure, Global Power Generation was created and entered the Chilean market. And in another context, the Museo del Gas was inaugurated. In short: company, growth and culture. An important international deployment took place, which meant that the group was present in 30 countries. In these years, the team grew from 6,000 employees to almost 20,000, net profit doubled to 1,502 million euros (2015), and the number of customers increased from 9.5 million to over 23.5 million. Great changes, great accomplishments.

The recognition of Salvador Gabarró’s activity meant that he was appointed honorary chairman of Gas Natural Fenosa and continued as chairman of the foundation. The company did not usually appoint its chairmen as honorary chairmen when they left office; in fact, there was only one precedent, that of Pere Duran Farell in 1997, which had been so until his death in 1999. Isidro Fainé said: “His appointment is in recognition of an exemplary executive, whose exceptional contribution and dedication have helped the company’s positioning, growth and leadership. As honorary chairman and chairman of the Gas Natural Fenosa Foundation, he will carry out the necessary work of representing the company”.⁵⁰⁸

Unfortunately, Gabarró’s subsequent activity was brief, as he died on March 17, 2017, a few months after his resignation as chairman, at the age of 81.⁵⁰⁹ In

508. GNF. Press release. *Salvador Gabarró, nombrado presidente de honor de Gas Natural Fenosa* (03-10-2016).

509. GNF. Press release. *Salvador Gabarró, presidente de honor de Gas Natural Fenosa, falleció hoy a los 81 años de edad en Barcelona* (17-03-2017).

addition to his many years of activity at Roca Radiadores, Gas Natural and Gas Natural Fenosa, Salvador Gabarró had been first vice-president of “la Caixa” and vice-president of the Fundació “la Caixa”, as well as president of the Círculo de Economía (1999-2002). He had received the Creu de Sant Jordi from the Generalitat de Catalunya (2010), the Medal of Honor from the Cámara de Comercio de Barcelona (Barcelona Chamber of Commerce) (2007) and the Llave de Barcelona (Key of Barcelona) (2006).

The Acceleration of Reference Guidelines

After a long, long, journey, we have reached the last 18 months of this extended history, almost to the present moment. The new Board of Directors, which had been appointed in September of 2016, had to consider what the development framework would be in the following years, with the new shareholders and the new chairman. At the end of 2016 and already in 2017, symptoms of a new style of asset and investment management began to appear, in the context of the guidelines and policies established by the company’s governing bodies. The emphasis was on strict and ongoing analysis of the use of shareholder capital and how to achieve greater efficiency in its applications. This implied a selective sale of assets, without giving up investments in organic business growth, and permanent monitoring of opportunities in the environment with new acquisitions and developments, maintaining a solid position in corporate social responsibility issues.

Another perspective was provided by the pace, the times in which the company moved forward, which had clearly accelerated; the scope of the group had expanded greatly, both by type of business and by country of operation. Limitations in time and space regarding the historical account mean that, in this book, we can only present the most relevant aspects, the highlights of the dense and loose mix of projects, changes, realizations and expectations, to illuminate and help interpret the road travelled, with its greatness and servitudes.

From another context, one element to be retained from this period is the move of the company’s headquarters in October of 2017 from its location in Barcelona, where it had been created in 1843, to Madrid, after 174 years of history. At a difficult time in terms of political relations between the governments of Catalonia and Spain, other large companies based in Catalonia had taken, or would take, similar decisions. Gas Natural Fenosa’s communiqué stated: “In view of the social and political events

that have taken place in recent weeks in Catalonia and due to the legal uncertainty that this has caused, the company's Board of Directors has resolved, as long as this situation persists: to change its registered office to the current corporate offices in Madrid, Avenida de San Luis, 77. This decision does not affect those companies in its group that provide their services exclusively in Catalonia, and is adopted in order to maintain the normal operation of the company and in order to protect the interests of the company, its customers, employees, creditors and shareholders".⁵¹⁰

The last few years have not been easy for utilities at the European level, the consequences of the economic crisis have reduced the growth of markets, while regulation has been conditioning the movements and operations of companies. On the other hand, the situation of technological change and the penetration of renewable energies and distributed generation have closed the circle. From December 31, 2009 to September 22, 2017, the Stoxx index for utilities fell by 23.2%, while in the same period the IBEX fell by only 13.7%. The companies most comparable to Gas Natural Fenosa⁵¹¹ recorded a 32.1% reduction in their share price. On the other hand, the market price of the company shares grew by a clear 26.1%.

The Intervention in Electricaribe (November 2016)

On November 15, 2016, the services of the Colombian government decided to take possession of the goods, assets and business of Electrificadora del Caribe (Electricaribe), as a preventive and temporary measure given the company's situation.⁵¹²

At that time, Electricaribe was the electricity distribution company of the Colombian Caribbean region, which served seven states (Atlántico, Bolívar, Cesar, Córdoba, La Guajira, Magdalena and Sucre) that included 188 municipalities. It was a very important local company, with 2.6 million customers at the time, served by 56,000 kilometers of networks and a team of 1,480 employees. The company had been acquired by Unión Fenosa in 2000, and later, in 2009, it was transferred to Gas Natural Fenosa after the merger process between the two companies; at that time it owned 85.38% of Electricaribe.

The company's problems stemmed from the strong cash-flow tensions caused by the non-payment of customers' bills, most of which were of obligatory supply, which were estimated at 1,260 million euros at the end of September of that year,

510. CNMV.GNF. Relevant fact. *Cambio domicilio social* (06-10-2017).

511. The members of the peer group concerned are: Iberdrola, Endesa, EDP, EDF, ENGIE, RWE, E.ON and Enel. The source of the data is Bloomberg.

512. CNMV.GNF. Relevant fact. *Medida preventiva Electrificadora del Caribe* (15-11-2016).

and also from the existence of significant consumer fraud. The intervention was thought to be temporary, and a negotiated solution was expected.

A few months after the intervention, on March 14, 2017, the Superintendencia de Servicios Públicos Domiciliarios (Superintendency of Public Utilities) resolved that the intervention would then be for “liquidation purposes”; it was estimated that a period of one year would be required to complete the resolution.

A few days later, on March 22, 2017, Gas Natural Fenosa presented the documentation to initiate a formal arbitration process before the Tribunal of the United Nations Commission on International Trade Law (UNCITRAL), which was foreseen as a suitable place for the resolution of differences in the Bilateral Agreement for the Promotion and Reciprocal Protection of Investments between Colombia and Spain.⁵¹³

The public administrators of Electricaribe estimated that, in 2017, they would have a cash deficit of 85 million euros, which, in Gas Natural Fenosa’s opinion, meant that the problem was not the company’s managers, but its regulatory and legal framework. The words of the chairman of Electricaribe appointed by the Superintendency on March 8, 2017, endorsed this line, when he stated: “We must change the culture of non-payment, setting an example from government agencies”.

At the beginning of April of 2018, the dispute was pending resolution. It should be noted that the Contraloría General de la República (Office of the Comptroller General of the Republic) carried out an audit report on compliance with the intervention process in December of 2017, in which it concluded that during the period of public management of the company, the quality of supply had deteriorated.

Sale of Buildings in Madrid (December 2016)

One of the first moves of the new era was the sale of the group’s four corporate buildings in Madrid, which would free up 206 million euros and enable it to obtain 35 million in capital gains from the operation and continue to rent out the buildings. The four buildings had a total of 57,000 square meters, with 1,695 parking spaces.⁵¹⁴

The most important building, the one on Avenida de San Luis 77, the former headquarters of Unión Fenosa, had 31,900 square meters and 979 parking spaces. It was sold for 120 million euros to Zambal Spain Socimi, S.A.

513. GNF. Press release. *Gas Natural fenosa ha solicitado hoy el inicio del procedimiento arbitral para que se le devuelva la sociedad colombiana Electricaribe* (22-03-2017).

514. GNF. Press release. *Gas Natural Fenosa cierra la venta de cuatro edificios corporativos en Madrid por 206 millones de euros* (27-12-2016).

The other three buildings were located on Avenida de América 38, in the building that had been Enagás' first headquarters in the 1970s, and the other two on Antonio López 193 and Acanto11-13. The price of the transaction amounted to 86.5 million euros; the properties had a total surface area of 25,100 square meters and 716 parking spaces.

The Energy Vulnerability Plan (January 2017)

In the context of the effects of the economic crisis and its consequences, Gas Natural Fenosa decided in January of 2017 to launch a new Energy Vulnerability Plan for the whole of Spain, with an annual budget of 4.5 million euros. The objective was to intensify the actions that were already being carried out, and to advance in the systematization of the management of vulnerable clients, strengthening collaboration with public administrations and related third sector entities.⁵¹⁵

The plan included operational measures, such as the creation of a Unidad de Atención a la Vulnerabilidad (Vulnerability Service Unit) to monitor the cases of customers who might be in a vulnerable situation, together with the development of a Grupo de Gestión de Colectivos Especiales (Special Collectives Management Group), which meant having a team of approximately 60 people dedicated to serving citizens with these profiles. It also included actions designed to provide training to the teams themselves and to the collaborating companies in dealing with this type of situation, as well as measures to make the payment of bills more flexible for customers in vulnerable situations.

Likewise, and in order to expand the platform for action, the activity of the foundation was reoriented to increase its dedication to social issues, mainly those related to energy vulnerability. A collaboration program was designed with social entities that work with vulnerable people, so that they could increase their actions on energy efficiency and household security issues. Plans were also made to set up an Escuela de Energía (Energy School) to support third sector entities and to advise municipal social service personnel on energy vulnerability issues. An additional line of action was the initiative to implement a corporate volunteer program among the company's employees.

Despite this, the company planned to continue and expand its already established proactive policy against energy poverty, which covered more than 90% of

515. GNF. Press release. *Gas Natural Fenosa lanza un plan nacional para personas vulnerables al que destina 4,5 millones de euros* (31-01-2017).

its customers in Spain, based on agreements with public administrations. During 2017, the company attended to more than 125,000 requests related to situations of energy vulnerability through the different channels opened to help its customers and which were aimed at users themselves, third sector entities and the social services of town and city councils.

The plan contributed new elements and lines of action to the practice, already developed during the years of the economic crisis, with intense collaboration between the company and the social services of the municipalities, in order to objectify as far as possible, propose and resolve the different situations of people with energy vulnerability or energy poverty.⁵¹⁶ The plan also provided greater emphasis on the issues of dissemination, communication, training and involvement of social agents, in order to minimize the possibility of repeating cases such as the one that occurred in Reus in November of 2016: a complex situation arose at the time of the death of a person in a situation of vulnerability, about whom no prior information was available to alleviate their situation.

Renewable Energy Contracts in Spain (May 2017)

Gas Natural Fenosa had made progress in renewable energies, both in the area of new projects achieved internationally in 2016, through the actions of Global Power Generation, and in Spain, through the activities of Gas Natural Fenosa Renovables.

In Spain, at the beginning of 2017, the company had an installed capacity in operation of 1,104 MW, of which 979 MW corresponded to wind farms, 110 MW to mini-hydraulic plants, and 15 MW to cogeneration and photovoltaic plants. Thirteen wind farms were under construction in the Canary Islands, with a capacity of 65 MW and an estimated investment of 100 million euros. The big opportunity in the country appeared with the auctions of renewables convened by the public administration in 2017. In the auction for 2,980 MW of wind power held in May of that year, the group was awarded 667 MW, or 22.4% of the total, and ranked second among the 14 bidders, with an estimated investment of some 700 million euros.⁵¹⁷ Subsequently, the 26 planned wind farms were designated, which would

516. The term energy poverty was coined by Professor Brenda Boardman in her PhD thesis *Fuel Poverty: from cold homes to affordable warmth*, published in 1991. In the case of Spain, for example, in Catalonia, these concepts were regulated in article 6 of Law 24/2015 of July 29, 2015, on emergency measures to deal with housing and energy poverty, which established the right of people at risk of residential exclusion to basic supplies of water, gas and electricity. It regulated as a precautionary principle that a prior communication protocol should be established with the municipal social services for the adequate qualification of persons at risk of exclusion.

517. CNMV.GNF. Relevant fact. *Gas Natural fenosa ha resultado adjudicataria de 667 MW de potencia eólica* (18-05-2017).

be located in seven autonomous communities: Andalusia, Aragon, Castilla y León, Catalonia, Extremadura, Galicia and Navarra.

In the case of photovoltaic energy, in the 3,909 MW auction held in July, Gas Natural Fenosa Renovables was awarded 250 MW, 6.4 % of the total; it was thus in fifth place among the 30 competitors. The planned investment was 165 million euros in the period 2017-2019.⁵¹⁸

The good results achieved meant that the technology available to the group and its selection of locations were optimal. In any case, it meant practically doubling the existing renewable capacity at Gas Natural Fenosa, by adding 917 MW. The commitment to renewables was gaining new momentum.

At the end of 2017, Gas Natural Fenosa Renovables had a total installed capacity of 1,147 MW in 70 installations in Spain.

Agreements for the Sale of 20 % of Gas Distribution in Spain (August 2017)

In 2017, the activity grouped in the company Gas Natural Distribution Business (GNDB), later renamed Holding de Negocios de Gas S.A. (HNG), and finally Nedgia, formed the main gas distribution company in Spain, with a market share of around 70 %, both in connection points and in the length of the associated network. The company's infrastructure consisted of nearly 53,000 kilometers of distribution network to supply natural gas to more than 5.3 million connection points, located in some 1,100 municipalities in Spain. The company was well ahead of the other three existing operators, which each held a market share of around 10 %. Gas distribution services also included other regulated services, such as inspections, gas meter rentals and others. In addition, the company also managed a gas transportation network of 1,255 kilometers, and 2,249 kilometers of network, with nearly 244,000 LPG connection points.⁵¹⁹ On an economic level, according to published figures for 2016, revenues amounted to 1,177 million euros, while ebitda stood at 889 million euros. The scope of activity included 13 operating companies.⁵²⁰

518. CNMV.GNF. Relevant fact. *Gas Natural Fenosa ha resultado adjudicataria de 250 MW de potencia fotovoltaica* (26-07-2017).

519. In 2015, an agreement had been reached with Repsol Butano, S.A. to acquire these LPG connection points for a total amount of around 450 million euros, and to carry them out over a period of time as the relevant authorizations were obtained. CNMV.GNF. Relevant fact. *Acuerdo compra puntos de suministro propano canalizado* (30-09-2015).

520. The distribution companies included in HNG were: Gas Natural Catalunya SDG S.A., Gas Natural Madrid SDG S.A., Gas Natural Castilla y León, S.A., Gas Natural Sociedad para el Desarrollo del Gas, S.A., Gas Natural Rioja, S.A., Gas Natural Balears, S.A., Gas Navarra, S.A., Gas Natural Aragón SDG S.A., Gas Natural Cegas S.A., Gas Natural Andalucía, S.A., and Gas Natural Castilla-La Mancha, S.A. Also included in the perimeter were: Gas Natural redes GLP S.A., and Gas Natural Transporte SDG SL.

On August 3, 2017, an agreement was announced to sell 20% of HNG to a consortium of long-term infrastructure investors comprising Allianz Capital Partners (ACP) and the Canada Pension Investment Board (CPPIB) for 1.5 billion euros, representing an enterprise value (100%) of 13.935 billion euros. In short, a value of 15.7 times the ebitda, when the average of the similar operations carried out in southern Europe in the period 2015-2017 was 14 times the EV/bitda ratio.⁵²¹

Under the terms of the agreement, Gas Natural Fenosa would maintain an 80% shareholding and continue to manage and consolidate HNG using the full integration method. The transaction provided Gas Natural Fenosa with positive reserves in equity of around 1 billion euros. In addition, a long-term intragroup financing agreement of 6 billion euros was entered into with HNG that was not expected to affect Gas Natural Fenosa's capital structure or its rating. The material execution of the transaction was pending the corresponding authorizations from the competition, which, once obtained, allowed the transaction to be closed on March 19, 2018.⁵²²

The buyers were the Allianz Group, one of the world's leading insurers and asset managers, which manages more than 650 billion euros on behalf of its insurance clients, and which conducted the acquisition through Allianz Capital Partners, the group's alternative investment manager, focusing on infrastructure, renewable energy and private equity funds. The other investor was the Canada Pension Plan Investment Board, a professional investment management organization that invested the surplus funds of the Canada Pension Plan, with its 20 million contributors and beneficiaries.

The operation allowed the company to continue controlling the gas distribution activity in Spain, with 1.5 billion euros being paid in cash. The possibilities for gas distribution activity to continue growing in Spain were significant, since the proportion of existing connection points over total households was only 32%, while in other European countries the figures were clearly higher, such as the United Kingdom (85%), Italy (66%), Belgium (53%) and Germany (48%).

On January 15, 2018, in the process of adapting the gas distribution activities in Spain to a new scenario of transformation and growth, the company launched the Nedgia brand to develop the supply points it served in the country through the different companies operating in the autonomous communities. All of them were

521. CNMV.GNF. Relevant fact. *Gas Natural Fenosa ha firmado un acuerdo para vender una participación minoritaria del 20% en la sociedad titular de los activos de distribución de gas natural en España* (03-08-2017).

522. CNMV.GNF. Relevant fact. *Completada transacción venta de 20% de HNG* (19-03-2018).

renamed under the new brand name: Nedgia Andalucía, Nedgia Aragón, Nedgia Balears, Nedgia Castilla-La Mancha, Nedgia Castilla y León, Nedgia Catalunya, Nedgia Cegas, Nedgia Galicia, Nedgia Madrid, Nedgia Navarra and Nedgia Rioja.⁵²³

The distribution holding company also adapted its name to Nedgia. The new brand was considered to reflect the roots and trajectory of the company, but betting on a future in which it should respond to new energy challenges such as natural gas for vehicles and renewable gas, working to improve air quality and energy innovation.

Agreements for the Sale of Assets in Italy (October 2017)

In the first months of 2017, Gas Natural Fenosa commissioned Rothschild to carry out a strategic review of its activities in Italy, which was necessary, not only because of the need for a permanent evaluation of the business portfolio, but also because of the expectation generated by the Italian government of significant changes in the future re-allocation of local distribution licenses, which presented new elements for existing operators. In Italy, gas distribution was highly fragmented, with more than 200 companies managing more than 7,000 concession areas. The new regulation meant consolidating the sector and reducing the complexity of the system.

Under these conditions, Gas Natural Fenosa decided to sell its business in Italy. It launched a competitive sales process for its operations in the country, and ended up signing the corresponding disposal agreements separately with 2i Rete Gas SpA and Edison SpA on October 13, 2017. A period of a few months was established to obtain the appropriate authorizations, until the operations could be definitively executed in February of 2018.

The agreement with 2i Rete Gas involved the sale of 100% of Nedgia, a natural gas distribution company in Italy (with the same name as the new distribution brand in Spain), and 100% of Gas Natural Italia SpA, the company that provided corporate services to both Nedgia and Gas Natural Fenosa's activities in Italy, for a total value of 727 million euros.

Nedgia, based in Bari, was the seventh largest gas distribution operator in the Italian market, operating in 223 municipalities in eight regions of southern Italy (Abruzzi, Basilicata, Calabria, Campania, Lazio, Molise, Puglia and Sicily) and had

523. GNF. Press release. *Gas Natural Fenosa lanza Nedgia, la nueva marca para su negocio de distribución de gas en España* (15-01-2018).

been awarded contracts to develop 26 other municipalities in the Cilento region. Overall, Nedgia managed 459,000 supply points through a distribution network of 7,300 kilometers.

The buyer 2i Rete Gas is the second largest gas distribution operator in Italy, after Italgas, with a market share of around 17% in terms of supply points, with 58,000 km of network in all areas of Italy. By 2016, 2i Rete Gas had distributed 5.5 bcm of natural gas to 3.9 million end users. The 2i Rete Gas company came from the former Enel Rete Gas acquired in 2009 by the F2i Fondi italiani per le infrastrutture fund, which subsequently became very active in additional acquisitions.

In turn, the agreement with Edison provided for the sale of a 100% stake in Gas Natural Vendita Italia SpA, Gas Natural Fenosa's gas and electricity trading company in Italy, including a guaranteed long-term supply contract of 11 TWh/year from the end of 2020, for an overall value of 293 million euros. In the overall amount, the supply contract was valued at 30 million euros, of which a payment of 20 million was foreseen in 2021 after the expected start of operations of the Trans Adriatic Pipeline (TAP), which was to carry Azerbaijani gas through the so-called Southern Corridor.

Gas Natural Vendita Italia, based in San Donato Milanese, commercialized gas and electricity throughout the country. In 2016, it had 420,000 residential gas customers and 14,000 SME customers, mainly in central-southern Italy, with a volume of gas sold of around 3 TWh. In the electricity market, it had 50,000 retail and SME customers.

The buyer Edison is a very old company, established to develop the electricity business in 1881, which had developed an important and permanent activity, and which in 2012 was acquired by the EDF group (Électricité de France). Edison is active in the acquisition, production and sale of electricity, as well as in the provision of energy and environmental services. It currently operates in Europe and the Mediterranean area, employs 5,000 people and has an electricity generation capacity of 6.5 MW.

In all, the operations represented a total of 1.02 billion euros; 759 million correspond to the purchase price and the remaining 261 million to net debt and minority interests. The capital gains on the transactions, net of taxes, were estimated at 190 million euros. Gas Natural Fenosa stated that: "The transactions are part of the efforts to optimize Gas Natural Fenosa's business portfolio and the ongoing review of its activities and geographies considered non-strategic".⁵²⁴ A clear concretion of the new line.

524. CNMV.GNF. Relevant fact. *Venta de sociedades y activos en Italia* (13-10-2017).

Agreements for the Sale of Gas Natural S.A. ESP in Colombia (November 2017)

Following the agreements to sell the assets in Italy and a stake in gas distribution in Spain, it was time to divest the shares of Gas Natural S.A. ESP in Colombia, this time after receiving an indication of interest from the Canadian fund Brookfield Infrastructure.⁵²⁵

Brookfield Infrastructure forms part of Brookfield Asset Management, a global asset management company with nearly \$250 billion in assets under management. Listed on the New York and Toronto stock exchanges, the company owns and operates long-term assets in the utilities, transportation, energy and communications infrastructure sectors in the Americas, Asia-Pacific and Europe.

Gas Natural S.A. ESP was the Colombian gas distribution and retailing company controlled by the group through a 59.1% stake in its capital. The company was listed on the Bogotá stock exchange and was therefore subject to the regulations of the Colombian stock exchange authorities.

Naturgy had started its investments in Colombia with the Gas Natural ESP controlling stock package, acquired from Ecopetrol in 1997. In the twenty years of management, the company's growth had been very significant; it grew from 400,000 customers to almost 3 million, with significant investments in the development of the distribution network, which had grown from the initial 5,000 kilometers to more than 22,000 in 2017. The company's ebitda and net attributable profit for the last 12 months ended September of 2017 were estimated at 138 and 35 million euros, respectively.

The value agreed for 100% of the company was set at 1.005 billion euros, which represented multipliers of 7.3 times the ebitda and 13.8 times the net profit. A two-phase execution was established, the first before the end of 2017, which was actually carried out from December 20 to 22, in which 17.2% of the company was transferred, with the result that Gas Natural Fenosa lost control and held a 41.9% stake.⁵²⁶ Subsequently, a second phase would take place in 2018, in which, after the appropriate authorizations from the stock exchange authorities, a delisting bid would be presented to both the rest of Gas Natural Fenosa's stake and the minority shareholders, who could thus benefit from an offer for their shares at the same price.

The transaction was estimated to have a positive accounting impact in 2017 of approximately 350 million euros, including both the gain on the sale of the initial

525. CNMV.GNF. Relevant fact. *Venta de su participación en la sociedad colombiana Gas Natural S.A. ESP (17-11-2017)*.

526. CNMV.GNF. Relevant fact. *Venta de una participación en la sociedad colombiana Gas natural S.A. ESP (22-12-2017)*.

holding and the revaluation associated with the remaining holding, due to the loss of control.

The sale was completed at the beginning of May of 2018, with the sale of the 41.9% stake it held in the Colombian company Gas Natural ESP. This completed the plan envisioned when the agreement with Brookfield Infrastructure was announced, for a total of 469 million euros.

The operation left as the company's only assets in Colombia the participation in Electricaribe, intervened by the Superintendencia de Servicios Públicos Domiciliarios. However, Gas Natural Fenosa publicly announced that the transaction did not affect the willingness to maintain a dialogue with the Colombian authorities that would avoid the arbitration procedure for the protection of investments; the managing director at the time, Rafael Villaseca, stated: "We remain willing to negotiate amicably with Electricaribe, as long as the appropriate regulatory conditions are guaranteed".⁵²⁷

In addition, several centralized customer services were maintained in Colombia for Brazil, Colombia, Mexico and Panama.

New Gas Distribution Permits in Mexico (December 2017)

Significant events in this quick review include divestments, but also new approaches to growth, adjudications and market development. In Mexico, in December of 2017, the Comisión Reguladora de Energía (Energy Regulatory Commission) (CRE) granted two new natural gas distribution permits to the group company in the country, Gas Natural México S.A. de CV. The new permits were located, on the one hand, in the state of Campeche, including the municipalities of Campeche, Del Carmen, Escárcega and Champotón, and, on the other hand, in the state of Yucatán, with the municipalities of Mérida, Conkal, Kanasin, Progreso, Ucú and Umán. The new permissions together represented access to a potential market of 513,000 new users.⁵²⁸

Naturgy arrived in Mexico, as explained above, in 1997, with its first permit in Toluca. After 20 years of presence, its activities were developed in four states: Sonora, Sinaloa, Valle de Mexico and Tabasco, and now Campeche and Yucatan were added with this award.

The accessible market in Mexico is about 8 million potential customers, and in recent years, through significant investments, a distribution network in operation

527. GNF. Press release. *Gas Natural Fenosa acuerda la venta de su participación en distribución de gas en Colombia al fondo canadiense Brookfield* (18-11-2017).

528. GNF. Press release. *Gas Natural Fenosa crece en México con nuevas concesiones y alcanza los ocho millones de clientes potenciales* (21-12-2017).

Table 62. Latin America. Supply Points (2017)

Country	Total (thousands)	Gas (thousands)	Electricity (thousands)
Argentina	1,651	1,651	—
Brazil	1,090	1,090	—
Mexico	1,773	1,773	—
Chile	3,687	602	3,085
Panama	641	—	641
TOTAL	8,842	5,116	3,726

Source: GNF. Presentation of fourth quarter 2017 results (07-02-2018).

of 20,000 kilometers has been established, an infrastructure of great strategic importance. The commercial activity has allowed the development of markets and has 1.7 million customers, distributed in 56 municipalities.

The presence in the country is complemented by four combined cycle power plants and a wind farm with an installed capacity of 2,429 MW, which supply electricity to the Comisión Federal de Electricidad (Federal Commission on Electricity) and private consumers.

The group's position is very important in Latin America, both in gas distribution and in electricity distribution, reaching almost nine million supply points by the end of 2017 and with significant prospects for future growth (Table 62).

Changes in the Chairmanship: Francisco Reynolds

Fifteen months after GIP became a shareholder, after CriteriaCaixa and Repsol reduced their stakes, and after Isidro Fainé was appointed chairman, the corporate structures were revitalized. In recent months there had been speculation in the media as to whether the sales of 20% of the gas distribution in Spain, and of the gas activity in Italy and Colombia, were a preparatory stage for a major acquisition operation with the financial resources obtained, even the name of a specific company was suggested. It seemed that a new wave of corporate integrations in the world of energy in Europe was approaching. On the other hand, the media also spoke of the possibility of Repsol selling its stake in Gas Natural Fenosa, an alternative which, if carried out, would clearly change the company's shareholding outlook and reference frameworks.

The situation began to become clearer at the Board meeting held on February 6, 2018, when Isidro Fainé resigned from his position as chairman and Francisco Reynés was appointed to replace him, until then chief executive of Abertis, another large company in which “la Caixa” had a stake and which at the time was subject to a takeover bid process by the Italian company Atlantia and also by ACS, via Hochtief.⁵²⁹

Reynés was therefore appointed chairman and CEO of Gas Natural Fenosa, replacing Isidro Fainé, who had been non-executive chairman since 2016, and Rafael Villaseca, who had been CEO since 2005.

Fainé was appointed honorary chairman of the company “thus ensuring continuity in the company’s management values at a time when it is facing major challenges”. The reality is that Isidro Fainé has had a close relationship with the company since the end of the 1980s, a significant thirty years, both for his different positions on the Board of Directors and for his perspective from “la Caixa”, the company’s main shareholder. In the last period, under his chairmanship, the company had adapted to a new shareholding situation, preparing itself for the new situations of the business and energy environment in the following years. Gas Natural Fenosa indicated that the decision to change the Board was made “within the context of the evolution of the business models of the energy sector at a global level, which particularly affect the technological, regulatory and capital markets”.

Rafael Villaseca, CEO during the last 13 years (2005-2018), and promoter of the major changes in the group described above, both under the chairmanship of Salvador Gabarró and that of Isidro Fainé, continues to be linked to the group in 2018 through his appointment as chairman of the Gas Natural Fenosa Foundation, now the Naturgy Foundation. The duration and stability, thirteen years, of Villaseca’s contribution as CEO should be highlighted; and more, if we compare it with the duration of his immediate predecessors in the position, given that up to five different holders were necessary to cover an equivalent period of time.

Francisco Reynés, born in 1963, is a native of Mallorca. He graduated as an industrial engineer, specializing in mechanical engineering, from the Universidad Politécnica de Barcelona, and completed his MBA at IESE; he also studied senior management programs in the United States and Germany. Since 2010 he has been executive vice-president and CEO of Abertis Infraestructuras, and since May of

529. GNF. Press release. *El Consejo de Administración de Gas Natural Fenosa nombra Presidente Ejecutivo a Francisco Reynés* (06-02-2008).

2015 he has been chairman of the Board of Directors of Cellnex Telecom, after leading its IPO.

Prior to his tenure at Abertis, he was managing director of Criteria CaixaCorp, the holding company of “la Caixa”, where he carried out the company’s IPO process in October of 2007. In recent years, he has also served on the boards of directors of Sanef, Eutelsat and Boursorama in France, Hispasat and Adeslas in Spain, Arteris in Brazil and Viaschile in Chile, among others.

It should be remembered that in 2007, for a few months, from April to July, Francisco Reynés worked for the group as managing director of Resources and member of the Management Committee, which gave him knowledge of the world of energy, in addition to that accumulated in his previous experiences at Uniland, Volkswagen, Johnson Controls and Dogi. In the period from January of 2008 to June of 2009, he was also closely related to the governance of Gas Natural SDG, as he was a member of the company’s Board of Directors.

The appointment of an executive chairman, who brings together the functions of chairman and chief executive, may have seemed odd considering what the standard practice has been in recent years at the company, but not long ago a similar experience had occurred in another Ibex company with the appointment of the executive chairman of Telefónica.

In addition, and in order to scrupulously comply with the principles of good governance, Ramón Adell was appointed at the same meeting as lead independent director. The figure of the coordinating independent director was born in the United States to solve the problem that could arise from the presence of the chief executive on the Board of Directors, especially if he was also the chairman. His main functions are to bring together independent board members in order to evaluate management without external constraints, ensure the flow of information from the executive to the independent board members, etc.⁵³⁰

Participation Agreements: CVC and March *versus* Repsol

The dynamics of the situation continued, however. If on February 6 a new executive chairman had been appointed at Gas Natural Fenosa, just 14 days later, on

530. CNMV/GNF. Relevant fact. *Cambio en la composición del Consejo de Administración* (06-02-2018). On the concept and functions of the independent coordinating director, see: “The Independent Coordinating Director”, Towers Watson News (14-11-2013).

February 22, 2018, Repsol announced, confirming the intense rumors of recent months, that it had reached an agreement with Rioja Bidco Shareholdings, SLU (Rioja Bidco) for the sale of 200,858,658 shares in the company, representing an ownership interest of approximately 20.072 % of the share capital, for an amount of 3.8 billion euros, equivalent to 19 euros per share.⁵³¹ The transaction would generate a capital gain of around 400 million euros for the Repsol Group.⁵³²

Rioja Bidco is a holding company controlled by funds advised by CVC (74.3%), in which Corporación Financiera ALBA also has a 25.7% stake. The total investment would be financed approximately 51/49 between equity and debt.

CVC Capital Partners is one of the world's leading private equity and investment advisory firms. It was founded in London in 1981 and currently employs more than 420 professionals worldwide. Its work is based on the high local expertise of its teams and the extensive network of contacts, as well as the long-term commitment of its investors, to acquire controlling or significant minority stakes in companies in Europe, Asia and North America in collaboration with their management teams, supporting the development of plans to create long-term sustainable value.⁵³³

Corporación Financiera ALBA, of the March Group, had made an investment of 500 million euros in Rioja Bidco; it thus obtained a significant but minority stake in the company, which would imply an indirect stake of approximately 5.1% in Gas Natural Fenosa by ALBA.⁵³⁴ The investment between capital and debt assumed represented the largest investment in the history of Corporación Financiera ALBA, according to the press.⁵³⁵

The operation was subject to the condition that the necessary authorizations were obtained within a period of no more than six months in Mexico, South Korea, Japan, Germany and Ireland. And, importantly, the signing by Rioja Bidco of the existing shareholder agreement between CriteriaCaixa and GIP no later than March 22, 2018, and the appointment, no later than the closing date of the sale, of three people appointed by Rioja Bidco as members of the Board of Directors of the future Naturgy, who would replace the representatives of Repsol.

531. The 19 euros per share represented a price 3.9% higher than the closing price of the previous day (18.28 euros).

532. CNMV.Repsol. Relevant fact. *La Sociedad comunica el acuerdo con Rioja Bidco Shareholdings, SLU, sociedad controlada por fondos asesorados por CVC, para la venta de un 20% del capital social de Gas Natural SDG, S.A.* (22-02-2018).

533. Summarized from the About CVC section of the CVC Capital Partners website. See: cvc.com [consulted 08-04-2018].

534. CNMV.ALBA. Relevant fact. *Acuerdo para la compra de una participación indirecta en Gas Natural SDG* (22-02-2018).

535. RECHE, Cristian: «Los March hacen en Gas Natural la mayor inversión de su historia». *Economiadigital.es*, February 23, 2018.

Once the transaction was completed, the shareholders of Gas Natural Fenosa, now Naturgy, would be distributed as follows: CriteriaCaixa (24.4%), Rioja Bidco (20.1%), GIP (20.0%), Sonatrach (4.0%) and free-float (31.5%), which was far removed from the traditional control that had existed for many years between “la Caixa” and Repsol. The change in the last two years had been very significant and would undoubtedly imply a profound reflection on what strategy the company should develop in the future.

At the meeting of the Board of Directors held on March 6, 2018, the Board of Directors began to adapt to the new situation, with the substitution of people among the board members representing Repsol, with the resignation of Josu Jon Imaz San Miguel and Miguel Martínez San Martín, and the appointment by co-optation of Iñigo Alonso de Noriega Satrustegui and Guillermo Llopis García. In addition, Alejandro García-Bragado Dalmau and Luis Suárez de Lezo Mantilla were appointed members of the Executive Committee.⁵³⁶

The dynamics of the transaction were altered on March 23, 2018, with the notification that Rioja Bidco had notified “its waiver of the condition that it sign a shareholders’ agreement with CriteriaCaixa SAU and GIP III Canary 1 S.à.r.l. to close the sale”⁵³⁷; the agreement should have been signed the day before.

The transaction was finally completed on May 17 and 18 of 2018, with the resolutions adopted by the Board of Directors of Gas Natural Fenosa, with a suspensive clause until the effective transfer of the shares, accepting the resignations of the board members Luis Suárez de Lezo, Iñigo Alonso de Noriega and Guillermo Llopis, as representatives of Repsol, and their replacement by: Rioja Bidco Shareholdings, SLU (represented by Javier de Jaime Guijarro), by Theatre Directorship Services Beta, S.à.r.l. (represented by José Antonio Torre de Silva López de Letona), and by Theatre Directorship Services Delta, S.à.r.l. (represented by Juan Arbide Estensoro)⁵³⁸ (Table 63)

The transfer of shares between Repsol, S.A. and Rioja Bidco Shareholdings, S.L.U. was executed on May 18, 2018, definitively lifting the suspensive clause agreed by the Board of Gas Natural Fenosa and restructuring the shareholdings in the company’s capital.⁵³⁹ The transaction also resulted in Corporación Financiera

536. CNMV.GNF. Relevant fact. *Cambios en el Consejo de Administración y sus Comisiones* (06-03-2018).

537. CNMV. Repsol. Relevant fact. *Información relativa al acuerdo alcanzado con Rioja Bidco Shareholdings, SLU, para la venta de un 20% del capital social de Gas Natural SDG, S.A.* (23-03-2018).

538. CNMV.GNF. Relevant fact. *Cambios en el Consejo de Administración* (18-05-2018).

539. CNMV. Repsol. Relevant fact. *Cierre de la venta del 20,072% del capital social de Gas Natural SDG a Rioja Bidco Shareholdings, y exclusión de Repsol del acuerdo con Criteria Caixa y GIP III Canary 1 sobre Gas Natural SDG* (18-05-2018).

Table 63. Gas Natural Fenosa. Board of Directors (18-05-2018)

Name	Position	Representation
Francisco Reynés Massanet	Chairman	Executive
William Alan Woodburn	Vice-President	Proprietary (GIP)
Ramón Adell Ramón	Coordinator Director	Independent
Enrique Alcántara-García Irazoqui	Member of the Board	Proprietary (CriteriaCaixa)
Xabier Añoveros Trías de Bes	Member of the Board	Independent
Marcelino Armenter Vidal	Member of the Board	Proprietary (CriteriaCaixa)
Mario Armero Montes	Member of the Board	Proprietary (GIP)
Francisco Belil Creixell	Member of the Board	Independent
Benita María Ferrero-Waldner	Member of the Board	Independent
Alejandro García-Bragado Dalmau	Member of the Board	Proprietary (CriteriaCaixa)
Cristina Garmendia Mendizábal	Member of the Board	Independent
Helena Herrero Starkie	Member of the Board	Independent
Rajaram Rao	Member of the Board	Proprietary (GIP)
Rioja Bidco Shareholdings, S.L.U (Javier de Jaime Guijarro)	Member of the Board	Proprietary (Rioja Bidco)
Theatre Directorship Services Beta, S.à.r.l. (José Antonio Torre de Silva López de Letona)	Member of the Board	Proprietary (Rioja Bidco)
Theatre Directorship Services Delta, S.à.r.l. (Juan Arbide Estensoro)	Member of the Board	Proprietary (Rioja Bidco)

Source: CNMV.GNF. Relevant fact. *Cambios en el Consejo de Administración* (18-05-2018).

Alba, S.A. indirectly holding 5.165% of Gas Natural SDG, S.A. through it has a 25.371% holding in Rioja Bidco Shareholdings, S.L.U. The majority shareholder of this company is Rioja Investment, S.à.r.l., a company owned by entities affiliated with CVC Capital Partners Advisory Company (Luxembourg) S.à.r.l.⁵⁴⁰

The 2018-2022 Strategy: Naturgy

For many years in Europe, the principal actors in mergers and acquisitions in the utilities sector (water, gas, electricity and waste) were the companies themselves. In the period 2000-2014, for example, they accounted for 60% of transactions. In

540. CNMV. Alba, Relevant fact. *Compra de una participación indirecta en GAS NATURAL SDG* (18-05-2018).

the period 2015-2017, however, 51% of utilities operations came from the financial sector.⁵⁴¹ This change in reference frameworks and environments is the starting point for interpreting the entry of international funds, such as GIP and CVC, into Gas Natural Fenosa's shareholding, with their significant financial investment and their undoubted contribution of new strategies and styles to the company's development.

Once the definitive restructuring of the shareholding was achieved, the dynamics of the events quickly emerged, with impressive activity and a long-term perspective. While a reduction in the number of members of the Board of Directors had been announced on May 21, 2018, a new business organization was introduced on May 30, 2018, also aimed at simplifying and improving the efficiency of activities. The final and most important acts of the upcoming change were reserved for the company's General Shareholders' Meeting, called for June 27 in Madrid, and for the presentation of the new strategy to the markets, in London, the following day.

To face the new stage, the company designed a new brand, Naturgy, and changed its name from Gas Natural SDG, S.A. to Naturgy Energy Group, S.A. All this was announced at the General Shareholders' Meeting. Also, the stock ticker was changed from GAS to NTGY.⁵⁴²

The new brand abandoned the word "gas" to link itself to a broader concept of energy and provide an international vision for all countries where the company was present.

The Naturgy brand, which reflected the historical legacy of the company, retained part of the previous name, and in the logo it incorporated an icon that recalled the butterfly created in 1992, but with a simpler, more streamlined image, in line with the change of typography.⁵⁴³

In the previous 175 years, we have explained different name changes, always at important moments of strategic reorientation of the company, with new challenges and the development of new opportunities. In this case too, the name update represented the new stage that began with the 2018-2022 Strategic Plan.

541. BRUNO, Tiziano; FRANKEL, David; LÉGER, Sébastien; VOLPIN, Antonio (2018): "How utilities can keep the lights on". *McKinsey&Company Electric Power & Natural Gas Practice*, May 2018, pp. 1-9

542. Naturgy, Press release. *Naturgy replaces Gas Natural Fenosa as the energy company's brand to face new challenges* (27-06-2018).

543. The brand change is in the same context as the transformation of GdF Suez into Engie in France, or the merger of Veba and Viag that led to E.ON in Germany; both went from gas- or electricity-based names to more global energy-oriented brands. In the case of Naturgy, two syllables of the word "Natural" from the previous denomination are retained as important, suggesting a more ecological substrate.

Table 64. Naturgy. Board of Directors (27-06-2018)

Name	Position	Representation
Francisco Reynés Massanet	Chairman & CEO	Executive
Ramón Adell Ramón (*)	Member of the Board	Independent
Enrique Alcántara-García Irazoqui	Member of the Board	Proprietary (CriteriaCaixa)
Marcelino Armenter Vidal	Member of the Board	Proprietary (CriteriaCaixa)
Francisco Belil Creixell	Member of the Board	Independent
Helena Herrero Starkie	Member of the Board	Independent
Rajaram Rao	Member of the Board	Proprietary (GIP)
Rioja Bidco Shareholdings, SLU (Javier de Jaime Guijarro).	Member of the Board	Proprietary (Rioja Bidco)
Pedro Sainz de Baranda Riva	Member of the Board	Independent
Claudio Santiago Ponsa	Member of the Board	Independent
Theatre Directorship Services Beta, S.à.r.l. (José Antonio Torre de Silva López de Letona)	Member of the Board	Proprietary (Rioja Bidco)
William Alan Woodburn	Member of the Board	Proprietary (GIP)

(*) Coordinating Director

Source: CNMV.Naturgy. Relevant fact. *Acuerdos de la Junta General de Accionistas y del Consejo de Administración posterior (27-06-2018)*

Naturgy was born with a focus on innovation, simplicity, globality and digitization, key elements to address the impressive forecast calling for 27 billion new electronic devices connected worldwide in just three years (2017-2020), or the expected increase of \$1 trillion in e-commerce sales in the same period.⁵⁴⁴

Furthermore, the changes to the Board of Directors agreed at the General Meeting held on June 27 led to a reduction of its 17 members to 12, distributed among the chairman & CEO, five independent directors and six proprietary directors, the latter representing the shareholders CriteriaCaixa, GIP and Rioja (CVC and Alba), with two directors each. The process of updating the corporate governance of the company included the disappearance of the Executive Committee and the simplification of the Board Committees, the Articles of Association and the Protocols of the General Shareholders' Meeting (Table 64).

544. Naturgy. Presentation to the market. *Naturgy: Much More 2018-2020*. London, June 28, 2018, p. 4

The global orientation of the 2018-2022 Strategic Plan was highlighted by the chairman in his presentation in the City of London on June 28. Before an audience of over 200 international investors, Francisco Reynés announced that the company's new roadmap aimed to make Naturgy grow, with strict financial discipline and "an increase in size only if we create value for shareholders and comply with the parameters of profitability, quality of service and safety that we have set ourselves. Our goal is value for all our stakeholders, not size".⁵⁴⁵

The proposed industrial model aimed to take advantage of the energy transition as an opportunity for growth in low CO2 and renewable energies, taking advantage of the contribution of gas and multiplying by three the capacity in renewable energies. The use of natural gas in mobility and the use of renewable gas would be promoted. In infrastructure, initiatives would be developed to increase electricity's share of the company's activity to 50% by 2022, and leading positions would be sought in countries with good prospects for organic growth based on electrification and natural gas penetration.

Investments for the period 2018-2022 were set at 8.4 billion euros, governed by the demanding profitability criteria established. From that moment on, the priorities were to focus on growth by organic development, in markets of significant size where control or similar shareholdings could be available to ensure the critical mass of operation and with clear growth possibilities. And on the other hand, the preference of development in terms of geographies should focus on countries with stable and predictable regulatory frameworks and low-volatility economies, such as those in the European Union, North America or OECD countries.

The application of these criteria should make it possible to reduce from 30 to 10 the geographies in which activities are carried out, simplifying operations and concentrating more on regulated activities, which would represent at least 70%, compared with the current 52%. And there would be a greater weight of electricity, which would represent at least 50% of activity in 2022, *versus* the current 40%, while gas would go from 57% to 40%, balancing business more clearly. Greater attention would also be paid to the services sector, which would account for 10% of all activities thanks to clear advances in technology and innovation.

To face this new stage, the company approved a simplification of the organization, with four business units instead of the previously existing six, and with

545. Naturgy. Press release. *Naturgy presents in London its Strategic Plan until 2022 focused on value creation* (28-06-2018).

greater autonomy and empowerment for decision-making and management. The objective of all this would be to facilitate the achievement of free cash flow, avoid duplication, relocate corporate functions and simplify the number of subsidiaries. The business units established were: Gas & Electricity, EMEA Infrastructures, Latin America Southern Zone Infrastructures and Latin America Northern Zone Infrastructures. On the other hand, the corporate areas should tend towards a reduction, while nonetheless ensuring centralized control.

The simplification of the organization, the revision of the processes and the strong digitalization were adopted in order to optimise operating costs (OPEX), with a progressive reduction, estimated at 500 million euros per year, in 2022.

At the presentation of the Strategic Plan, the company's chairman also announced a review of the value of the assets of the companies of the Group. A write-down of 4.9 billion euros to the value of conventional generation assets was made, a decision that would not affect the dividend policy⁵⁴⁶ and would make it possible to face the future with valuations more in line with the reality of the markets, facilitating options in the coming years.

In this sense, one of the main commitments of the new strategy presented was the shareholder remuneration policy, with an increase in dividends of 30% in 2018, rising from 1 to 1.30 euros per share, and with an annual growth of 5% in the following years until the horizon of the plan in 2022. In addition, if no inorganic growth investments (acquisitions) with adequate profitability were made, the possibility of a buy-back of shares of up to 400 million euros per year was established as additional remuneration to shareholders.

In short, a balanced growth strategy, which did not seek to maximise size but rather profitability, with the necessary investments and the return of free cash flow to shareholders, while maintaining the level of indebtedness. The markets reacted positively to all this information regarding Naturgy's new strategy, with a 4% increase in the share price from the day before the General Shareholders' Meeting until the day after the new strategy was presented.

The constant transformation of the company and its constant adaptation to the environment continued to develop new paths, new challenges and new opportunities.

The story continues...

⁵⁴⁶ Dividends are derived from the parent company's profits, while valuation adjustments are made in the companies that own the assets and, therefore, in the consolidated group as a whole.

Epilogue

In the long march of this story that reaches its end, all kinds of situations have been raised and described, qualified with opportunities and problems. The historical characteristics of the main character, the company now known as Naturgy, its personality, its innovative profile, its capacity to fight and its spirit of commitment, have been glimpsed. They are all fundamental elements that have allowed it to develop lines of anticipation, adaptation and transformation of reality, and all of them in the course of an incredibly long time span, no less than 175 long years.

In short, I hope I have contributed some elements to know the company's character, remembering what Max Weber said: "We can only know what we are if you determine how we have become what we are". Another thing are the paths of the future; Naturgy's strategy will be shaped by the company's governing bodies. But it is worth considering what the environments will be like with which the company will have to work and interrelate in the new times. To ask oneself questions such as: how will the social context served by the company evolve, and also, what will be the directions of change and development of the energy world in the future, and indeed, what will society demand of companies in the coming years? It must be assumed beforehand, however, that foresight is not an exact science, and probably will be even less so in the years to come.

In the social environment, it must be recognized that when humanity faces great challenges, it is able to move forward and solve them. An example of this are the results of the United Nations Millennium Development Goals, which over a period of 25 years (1990-2015) have decreased the number of people living in extreme poverty in the world from 1.9 billion to 836 million, a major step forward for more than a billion people on the planet.⁵⁴⁷ Continuity towards the future of these important challenges for humanity is built on the Sustainable Development Goals (SDG), agreed on September 25, 2015 by more than 150 heads of state and government within the framework of the United Nations, and which establish, among others, the goal of ending extreme poverty by 2030.⁵⁴⁸

The SDG also advocate new targets for the energy sector: to ensure universal access to affordable, reliable and modern energy services, and to increase the share of renewable energy and improve energy efficiency. But there are many

547. Extreme poverty is understood to be that of people with an income of less than US\$1.25 per day. See United Nations (2015), p. 4.

548. See www.un.org/sustainabledevelopment/ [consulted 2018.04.15].

other areas for improvement; progress must be made in health, education, gender equality, working conditions, reducing inequalities, climate action, and eradicating hunger in the world, and so on, up to 17 different epigraphs. Great challenges, but with a clear line of orientation and search for results.

But the evolution of the world is not only composed of great goals, it is also formed, and with increasing importance, by the disposition of citizens, the evolution of values, progressive uncertainty and the massive proliferation of the Internet and social networks.

In the field of energy, the International Energy Agency is proposing a long-term framework of reference⁵⁴⁹, in which the vectors for development are the rapid deployment and cost reduction of renewable energy technologies. In the period 2010-2017, for example, the costs of photovoltaic solar energy fell by 70% and those of wind energy by 25%.

Another element of the energy reference framework will be the progressive electrification of energy. In the increase in final consumption up to 2040, a significant 40% will already be electricity consumption. This element has two important components: on one hand, the progressive introduction of electricity into the daily habits of citizens with the advance of the digitization process and the introduction of smart technologies, always based on electricity, and on the other hand, the possibility of access to electricity consumption for large groups of the world's population, to whom this element of modernity has not yet reached. In the period 2012-2017, an estimated 100 million additional people worldwide gained access to electricity each year, although it is projected that 675 million people will still be without it by 2030, mainly in sub-Saharan Africa.

Natural gas, cleaner than the rest of the fossil fuels, has a guaranteed growth path until 2040, in the substitution of coal and oil, mainly in countries such as China or India, but also in the United States. A new horizon for natural gas appears with LNG exports from the United States, and the creation of a strong global market for affordable and safe gas at reasonable prices. International trade in natural gas is expected to grow from 706 bcm (2016) to 1,230 bcm (2040) in 25 years, 59% in the form of LNG, with a priority destination in Asia, where 60% of the total will be directed.

Technology and business models will also make their contribution to change, with the diffusion of the electric vehicle, perhaps slower than initially expected,

549. IEA (2017), *Executive Summary*, pp. 1-8.

and of natural gas vehicles; as well as the introduction of renewable gas⁵⁵⁰, the development of new batteries for vehicles, but also for homes and, from another perspective, smart grids. Another element is provided by the concept of self-production, or generation distributed over the territory, on a small scale, but close to consumption and the needs of citizens. In all these areas, the evolution of regulatory systems and the corresponding legal frameworks and the progressive digital transformation of society will be of great importance.

The strong promotion of sustainable development scenarios will boost activity in the gas and electricity sectors, and renewable energies, necessary elements in any policy to fight climate change in the next 20 years, and in which Naturgy's core business is located.

In recent years, and with a progressive trend towards the future, companies have had to make efforts and make progress in the areas of corporate social responsibility (CSR), in which Naturgy has always had an advanced position. Society will be progressively more demanding on issues such as transparency, values, ethics, good governance, commitment and similar concepts, helping to shape the reputational values of companies and their relationship with their stakeholders.

Throughout this book, the profiles of the historical figure that is Naturgy have been presented with greater or lesser clarity. The trajectory of the company is the result of the intense work of many governance and management teams; without their efforts the long vital journey described would not have been possible. The ability to relate to different environments has also been a permanent element: shareholders, employees, customers, suppliers. In short, with society in general, with all its vigor, strength and vital energy.

We have presented the opinion of some managers, such as José Gil, in 1849, when he called for austerity in spending: "One of the main and most fruitful causes of profits is the system of savings applied with the greatest rigor to all objects". Or Ricardo Margarit, who said, in 1961, that during his mandate he had maintained "the industrial and independent character of La Catalana, without any mediations of any kind". And finally, Pere Duran, recalling in the celebration of the company's 150th anniversary that "the most characteristic existential trait of the life of our

550. Renewable gas is energy obtained from waste (wastewater, urban and rural organic waste, food and agriculture, etc.) and can be injected directly into the existing gas infrastructure, becoming part of it and can be used by the consumer at any of the connection points. It is a solution already implemented in Europe, where there are more than 18,000 plants; Germany, the United Kingdom, Sweden and Denmark are countries of reference in this energy, in which Spain has unquestionable potential.

company, as a historical figure of Catalan civil society, is that it has never ignored or abdicated its roots, which are firmly implanted in the social environment in which it has lived in authentic symbiosis since its very constitution". All of them are elements of a refined historical personality, with an infinite number of nuances.

Two methodological remarks can be added. History, as we have seen, has arrived up to this very moment, and it should be noted here that a few years of maturing of events and an assessment of the facts in the appropriate contexts is clearly needed in order to have an adequate historical perspective of recent years. Despite this circumstance, and apologizing in advance, it has seemed more useful not to forget the last 30 or 40 years of work, years of great importance in the evolution, change and dimensioning of the current Naturgy.

Secondly, with regard to the documentation and available sources used, it should be pointed out that, in the first part of this work, significant use has been made of documentary and archival sources, which are often unpublished, such as the books of minutes of the different governing bodies and of the general shareholders' meetings. In the last part, the information is based more on published information, both relevant facts deposited with the Comisión Nacional del Mercado de Valores (National Securities Market Commission) and the company's annual reports and press releases. For the years 1965 to 2013, there is an additional source, which is my own experience in the development of my professional activity during 47 years in the company; of these, 27 years in the Management Committee of the group, through which I have participated in many of the operations described.

To conclude, after the presentation of some of the lines that will shape the future, we can only wish that Naturgy can continue to develop its business activity, within the context of the permanent changes that lie ahead, obtaining great successes and building new paths and new stages of this history. Maintaining, as always, its capacity to anticipate, adapt and transform reality. One should keep in mind, to quote John L. Petersen, that: "the future doesn't just happen, we make it happen".

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Appendix 1. Naturgy. Share capital (1843-2017)

Year	Millions pesetas	Thousands euros	Year	Millions pesetas	Thousands euros	Year	Millions pesetas	Thousands euros
1843	1.5	9	1962	570	3,426	1978	5,163	31,031
1853	2.0	12	1964	660	3,967	1985	5,809	34,910
1855	2.3	14	1965	785	4,718	1986	6,535	39,274
1864	3.0	18	1966	985	5,920	1987	7,352	44,183
1875	3.8	23	1967	1,135	6,821	1988	8,894	53,452
1879	4.1	25	1969	1,335	8,024	1989	13,182	79,225
1906	12.4	75	1970	1,878	11,286	1990	15,818	95,070
1912	40	240	1971	2,007	12,064	1991	22,389	134,559
1915	60	361	1972	2,441	14,670	1997	74,629	448,529
1919	75	451	1973	2,832	17,023	2009	153,367	921,757
1946	200	1,202	1974	3,620	21,755	2011	165,000	991,672
1955	300	1,803	1975	3,779	22,712	2012	166,501	1,000,689
1959	450	2,705	1976	4,295	25,812			
1960	470	2,825	1977	4,303	25,859			

Source: Company Reports and Minutes of the Shareholders Meetings.

Appendix 2. Naturgy. Shareholders (1991-2018)

Shareholder	31.12.1991	31.12.2013	31.12.2016	18.05.2018
Grupo "la Caixa"	25%	34.6%	24.4%	24.4%
Grupo Repsol	30%	30.0%	20.1%	—
Instit. Nacional Hidrocarburos	14%	—	—	—
GIP III Canary 1 S.à.r.l.	—	—	20.0%	20.0%
Rioja Bidco Shareholdings SLU	—	—	—	20.1%
Sonatrach	—	4.0%	4.0%	4.0%
Other shareholders	31%	31.4%	31.5%	31.5%

Source: Company reports and CNMV relevant facts.

Notes: The information for 2018 corresponds to the situation after the execution of the operation between Repsol and Rioja Bidco.

Appendix 3. Naturgy. Customers or supply points and employees (1923-2017)

Year	Customers or Supply Points			Employees (number)
	Gas (thousands)	Electricity (thousands)	Total (thousands)	
1923	111			
1930	154			
1940	195			
1950	200			
1960	236			
1961	245			2,331
1970	416			1,750
1980	646			1,580
1990	1,106			2,352
1991	1,810			3,070
2000	6,991			6,647
2008	11,492			6,842
2009	11,790	9,136	20,926	19,346
2010	11,361	9,436	20,797	18,778
2015	13,171	10,622	23,793	19,939
2017	10,491	7,415	17,906	15,375

Source: Falgueras (1969), pp. 165-177; Company reports and presentation of results 2017.

Notes: Customers. 1923, corresponds to the clients of the city of Barcelona. 1930-1960, it also incorporates those supplied from the gasworks of Badalona, Premià de Mar, Sabadell and Terrassa. 1961-1990, additionally adds the clients from Seville. 1991, merger with Gas Madrid. As of 2009, instead of customers, they are supply points, incorporating the merger with Unión Fenosa; **Employees.** Corresponds to the number of employees at 31-12, except in 2000, which is the average workforce for the year. The figure for 2017 does not include the number of employees in the businesses classified as discontinued operations (1,396 persons).

Appendix 4. Spain. Natural gas sector statistics (1985-2017)

Year	Municipalities with natural gas (nº)	Supply points (thousands)	Transportation and distribution networks (km)	Natural gas demand				
				Domestic-commercial (GWh)	Industrial (GWh)	Electricity plants (GWh)	Non-energy uses (GWh)	Total demand (GWh)
1985	159	1,513	8,932	n.d.a.	n.d.a.	n.d.a.	n.d.a.	n.d.a.
1990	360	1,940	13,965	10,771	44,166	2,254	4,835	62,026
1995	544	2,776	21,162	18,101	69,381	879	6,196	94,557
2000	948	4,203	37,022	34,755	144,994	10,379	6,131	196,258
2005	1,204	6,041	55,295	56,425	202,278	111,320	6,199	376,221
2010	1,497	7,196	74,273	64,328	194,089	135,625	6,131	400,174
2015	1,688	7,618	83,830	51,774	196,503	61,238	5,283	314,798
2017	1,759	7,809	87,070	53,360	217,720	75,682	4,144	350,907

Source: Sedigas, *Informes anuales*.

Notes: In the demand figures for natural gas in the early years there are very small figures for manufactured gas and later for propane air.

Appendix 5. Naturgy. Economic and stock market information (1949-1990)

Year	Net amount turnover (millions pesetas)	Ebitda or Gross operating profit (millions pesetas)	Attributable net profit (millions pesetas)	Market capitalization (millions pesetas)
1949			11	
1950			17	
1960			53	
1961			50	
1962	389	40	58	
1970	1,261	623	166	
1980	18,991	3,291	626	2,685
1990	56,049	15,263	6,986	133,138

Source: Company reports.

Notes: The first audited accounts were published in 1977. Until 1986, the data are for the parent company and from 1987 onwards, they are consolidated data.

Appendix 6. Naturgy. Economic, financial and stock market information (1990-2017)

Year	Net amount turnover (millions EUR)	Ebitda or Gross operating profit (millions EUR)	Attributable net profit (millions EUR)	Net investments (millions EUR)	Net financial debt (millions EUR)	Market capitalization (millions EUR)
1990	337	92	42	87	38	800
1991	517	147	63	132	67	1,379
1992	605	183	74	184	85	1,321
1993	933	301	88	235	200	1,906
1994	1,281	408	143	751	876	2,539
1995	1,743	571	215	634	1,047	4,239
1996	2,003	672	291	873	1,442	6,773
1997	2,575	794	304	842	2,053	7,087
1998	2,683	907	351	831	2,105	13,860
1999	3,170	1,140	426	1,028	2,651	10,241
2000	4,892	1,360	497	1,726	3,665	8,687
2001	5,531	1,484	571	1,012	3,677	8,373
2002	5,268	1,366	806	1,067	1,627	8,091
2003	5,628	1,202	568	1,361	1,869	8,306
2004	6,266	1,335	642	1,504	2,650	10,191
2005	8,527	1,519	749	1,484	3,615	10,594
2006	10,348	1,912	855	1,163	3,071	13,429
2007	10,093	2,277	959	2,323	3,689	17,920
2008	13,544	2,564	1,057	3,697	4,913	8,638
2009	14,873	3,923	1,195	15,243	20,916	13,905
2010	19,630	4,477	1,201	1,553	19,102	10,591
2011	21,076	4,645	1,325	1,514	17,294	13,155
2012	24,904	5,080	1,441	1,386	15,995	13,589
2013	24,969	5,085	1,445	1,636	14,641	18,708
2014	24,742	4,853	1,462	4,389	16,942	20,824
2015	26,015	5,264	1,502	2,082	15,648	18,828
2016	23,184	4,970	1,347	2,225	15,423	17,922
2017	23,306	3,915	1,360	1,597	15,154	19,263

Source: Company reports and presentation of results 2017.

Notes: 1991 Merger of Catalan de Gas with Gas Madrid; 2009 Gas Natural SDG Fusion with Unión Fenosa; 2014 CGE acquisition (Chile). Until 2003, Spanish accounting standards were applied, and from 2004 onwards, IFRS were applied. Year-on-year comparisons may show significant differences due to changes in the group's consolidation perimeter.

Appendix 7. Sociedad Catalana para el Alumbrado por Gas. Chairmen of the Board of Directors (1843-1906)

Period	Name
1843-1844	Félix Ribas
1845-1846	Ramón Adzerias
1847-1864	Félix Ribas
1864-1870	Mariano Franquesa
1870-1870	Martín Masferrer Roig
1870-1876	Joaquín Vehils Catá de la Torre
1876-1877	Juan Roig Sala
1877-1877	Magín Soler Casañas
1877-1890	Melchor Ferrer
1890-1894	Ildefonso Par
1894-1895	Severo Figarola
1895-1906	Álvaro M. ^a Camín López

Appendix 8. Naturgy. Chairmen of the Board of Directors (1906-2018)

Period	Name
1906-1919	Álvaro M. ^a Camín López
1919-1922	Juan Desvalls Amat, Marquis of Alfarrás
1922-1945	Eusebio Bertrand Serra
1945-1965	Juan Bertrand Mata
1965-1984	Pere Duran Farell
1984-1991	Pere Grau Hoyos
1991-1997	Pere Duran Farell
1997-2004	Antoni Brufau Niubó
2004-2016	Salvador Gabarró Serra
2016-2018	Isidro Fainé Casas
2018-	Francisco Reynés Massanet

Note: Naturgy has legally had different names throughout its history: The Sociedad Catalana para el Alumbrado por Gas (1843-1912), Catalana de Gas y Electricidad (1912-1987), Catalana de Gas (1987-1992), Gas Natural SDG (1992-2018) and now Naturgy Energy Group.

Appendix 9. Naturgy. Top executives (1843-2018)

Name	Title and period
José Gil Serra	Administrator (1843-1845)
José Farrán	Administrator (1845-1849)
José Gil Serra	Director (1849-1877)
José Mansana Dordán	General Administrator (1877-1892)
José Mansana Terrés	General Administrator (1892-1906), Executive General Manager (1906-1934)
Ricardo Margarit Calvet	Managing Director (1934-1945), Executive Managing Director (1945-1961)
Pere Duran Farell	CEO (1961-1965)
Luis Marquet Torrents	Managing Director (1965-1967)
José Arbós Batista	Managing Director (1967-1972)
Pere Grau Hoyos	Managing Director (1972-1977)
Joan Romagosa Petit	Managing Director (1977-1984)
(1984-1991) Josep M. Batalla Catà, José Manuel Manzanedo Díaz, Joaquim Maluquer Sostres, Joan Romagosa Petit (1984-1989) Francesc Badia Vidal, Pere-A. Fàbregas Vidal (1985-1989) José Musté García, Miquel Ribas Pujol	Executive Board Members (1984-1991)
Antonio Téllez de Peralta	CEO (1991-1993)
Juan Badosa Pagés	CEO (1993-1996)
Guzmán Solana Gómez	CEO (1996-1999)
José Luis López de Silanes	CEO (1999-2003)
Enrique Locutura Rupérez	CEO (2003-2005)
Rafael Villaseca Marco	CEO (2005-2018)
Francisco Reynés Massanet	Chairman & CEO (2018-____)

Appendix 10. Energy units

Conversion factors	Kcal	BTU	te	Therm	kWh
Kilocalorie	1	3.967	10^{-3}	3.967×10^{-5}	$1,163 \times 10^{-6}$
British Thermal Unit	0.252	1	0.252×10^{-3}	10^{-5}	293.1×10^{-6}
Thermie (te)	1,000	3,967	1	$3,967 \times 10^{-5}$	1.163
Therm	25,200	100,000	25.2	1	29.3
Kilowatt-hour	860	3,412.14	0.860	$3,412 \times 10^{-5}$	1

Appendix 11. Monetary units

Conversion factors	Peso	Peseta	Real	Maravedí	Euro
Peso fuerte	1	5	20	680	0.03
Peseta	0.20	1	4	136	0.006
Real de vellón	0.05	0.25	1	34	0.0015
Maravedí	0.14×10^{-2}	0.73×10^{-2}	0.0294	1	0.44×10^{-4}
Euro	33.3	166.386	666	22,628	1

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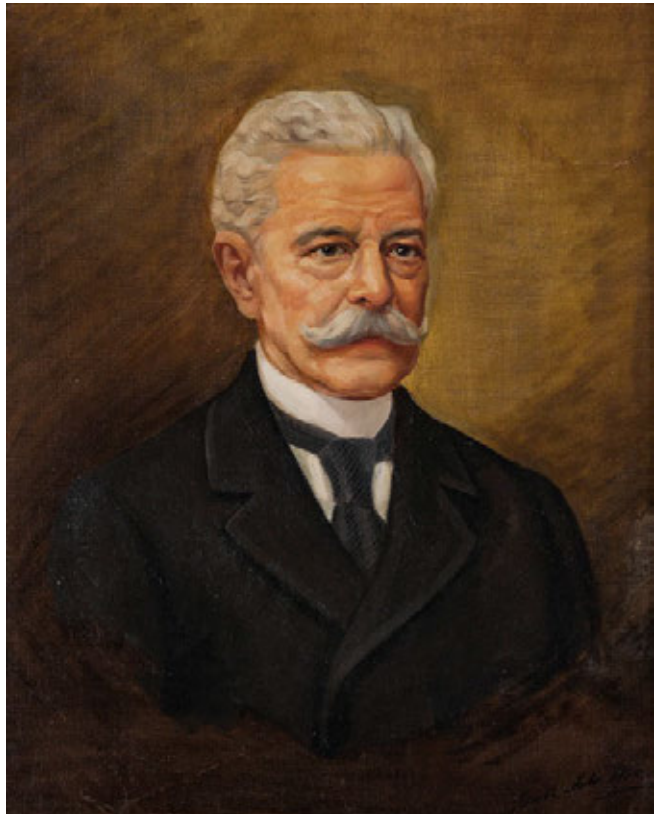
Medallion and signature of Charles Lebon.
Archive Naturgy.



Portrait of Pedro Gil Babot by
Vicente Rodes, 19th century.
Collection of the Gil family.



Portrait of José Gil Serra, by Sainz de la Maza, 20th century. Photograph by Dani Rovira, 2014. Archive Naturgy.

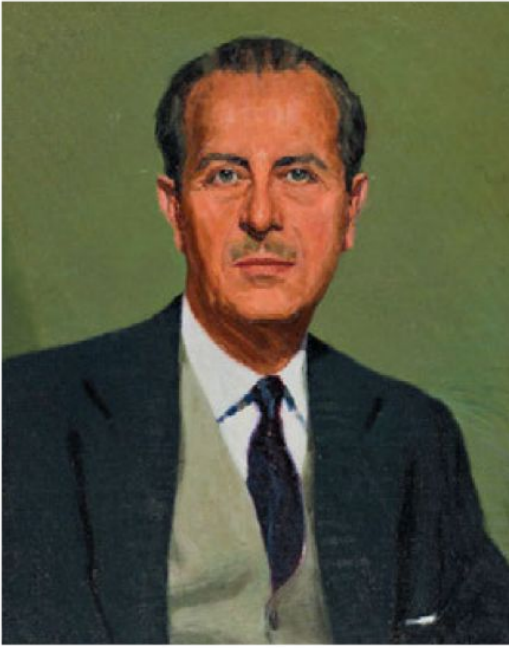


Portrait of José Mansana Dordan, by Alberto Palito, early 20th century. Photograph by Dani Rovira, 2014. Archive Naturgy.

Portrait of José Mansana Terrés,
attributable to J. Puig, 1935.
Photograph by Dani Rovira, 2014.
Archive Naturgy



Portrait of Ricardo Margarit. Ramón
Batlles, 1950. Archive Naturgy.



Portrait of Juan Bertrand Mata, by J. Vidal Quadras, 1968.
Photograph by Dani Rovira, 2014. Archive Naturgy.

Portrait of Pere Grau, 1989. Archive Naturgy.



Portrait of Pere Duran, 1996.
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Portrait of Antoni Brufau, 2004.
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Portrait of Salvador Gabarró, 2009.
Archive Naturgy.

Portrait of Isidro Fainé, on the day of his appointment, 2016. Archive Naturgy.



Portrait of Francisco Reynés, 2018. Archive Naturgy.



Building of the company's former headquarters on Avenida del Portal de l'Àngel (Barcelona), [n.d.a.]. Archive Naturgy.



Inside the gas appliances showroom and shop, located on Avenida del l'Àngel (Barcelona). Ramon de Baños, 20th century. Archive Naturgy.

Building of the Compañía Central de Alumbrado por Gas, Lebon y Cía., 20th century. Archive Naturgy.





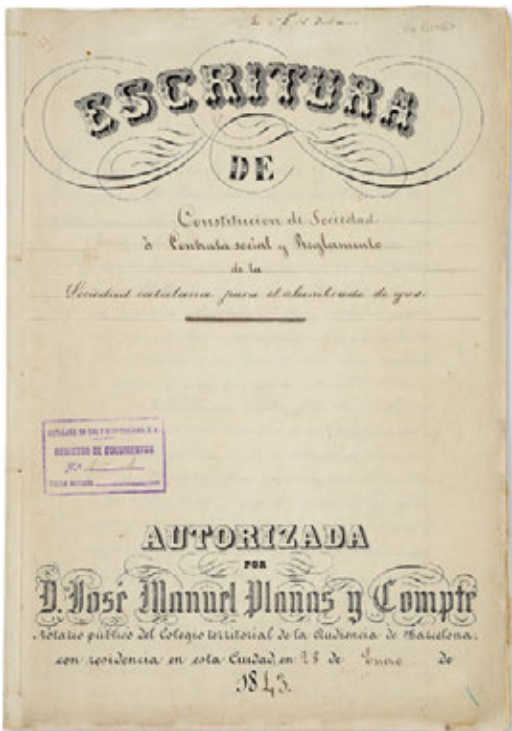
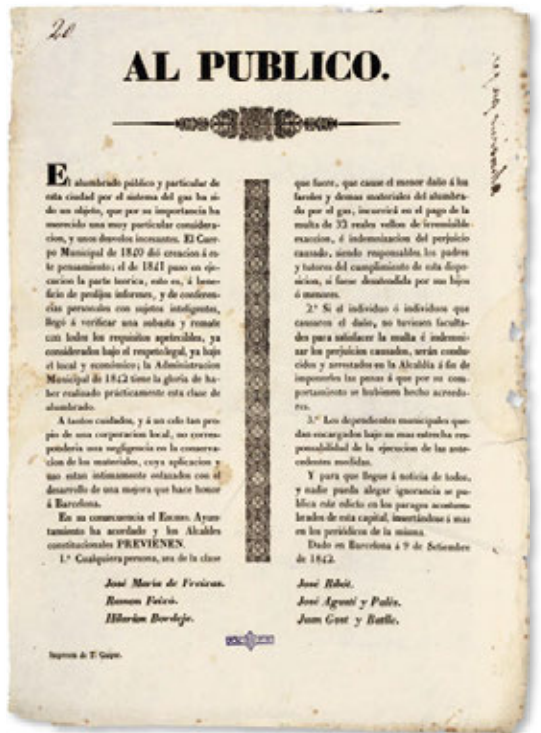
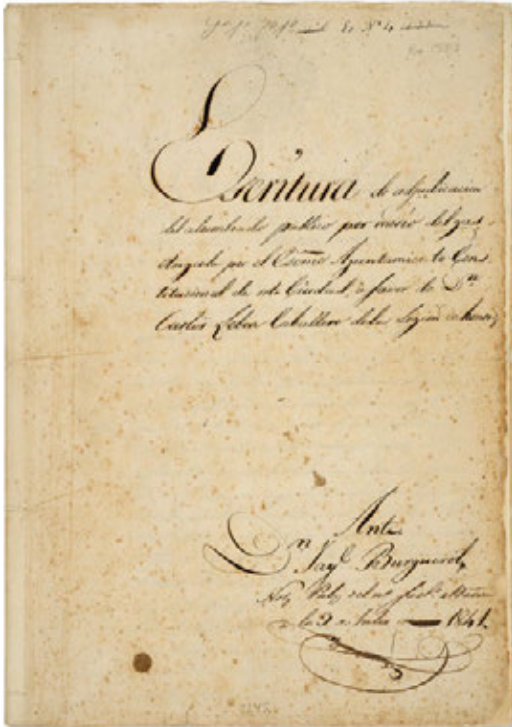


Previous page:

Company headquarters in Barcelona, 2014.
Archive Naturgy.

Above: Detail of the company's headquarters
in Madrid, 2018. Archive Naturgy.

Below: Museo del Gas in Sabadell. Pau Palacios, 2013.
Archive Naturgy.



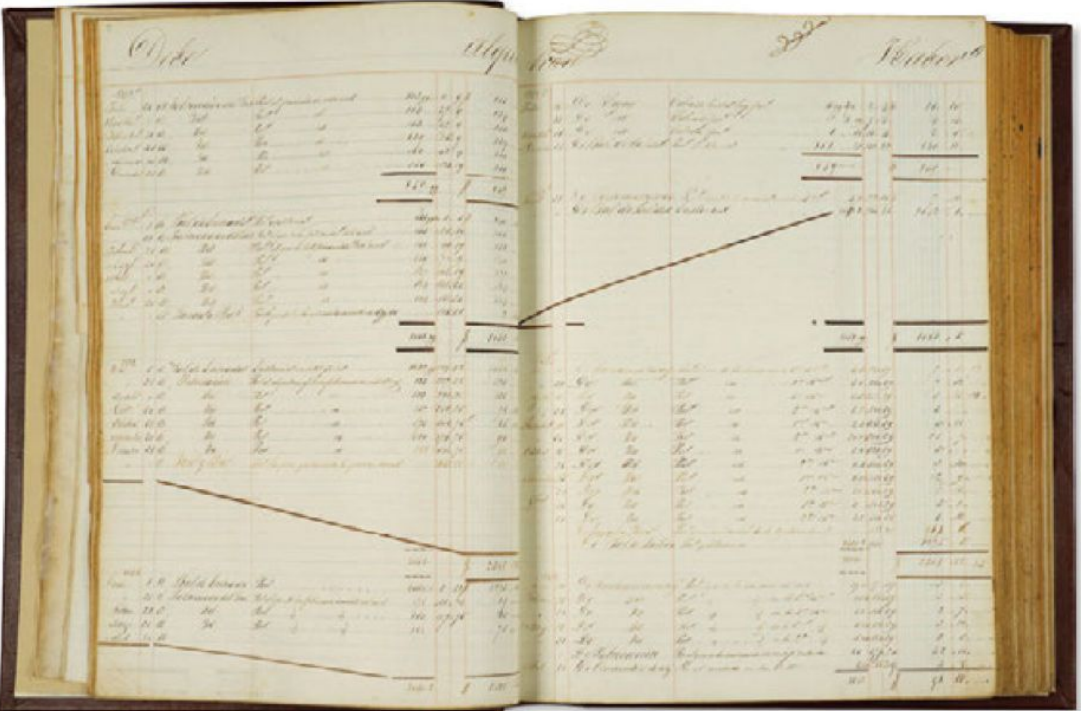
Above left: Deed of 1841, by which the Ayuntamiento of Barcelona awards the gas lighting of the city of Barcelona to Charles Lebon. Dani Rovira, 2018. Archive Naturgy.

Above right: Public edict of the year 1842. Historical Archive of the City of Barcelona.

Below: Deed of incorporation of the Sociedad Catalana para el Alumbrado por Gas, 1843. Dani Rovira, 2018. Archive Naturgy.



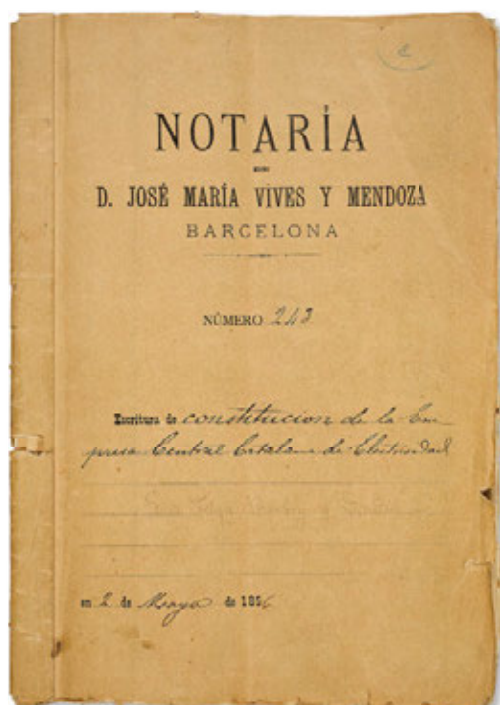
Share of 4,000 reales de vellón from about 1843. Archive Naturgy.



General ledger of the Sociedad Catalana para el Alumbrado por Gas, from 1844 to 1848. Dani Rovira, 2018. Archive Naturgy.



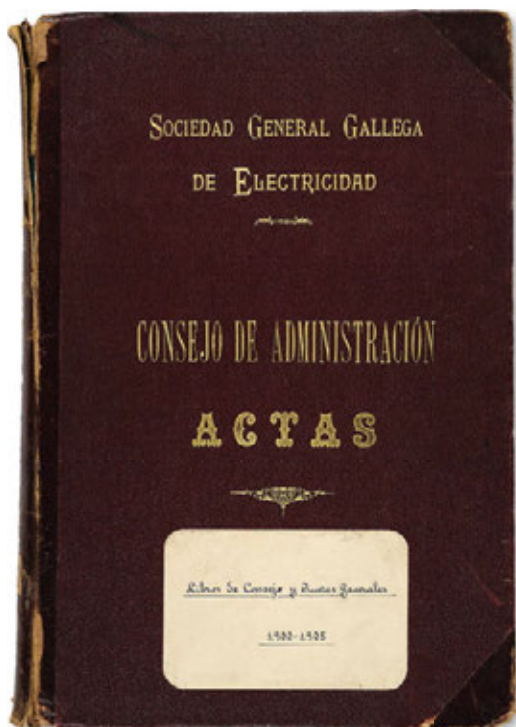
Accounting document of the gasworks of Ferrol, with the anagram of the Sociedad Catalana para el Alumbrado por Gas, 19th century. Archive Naturgy.



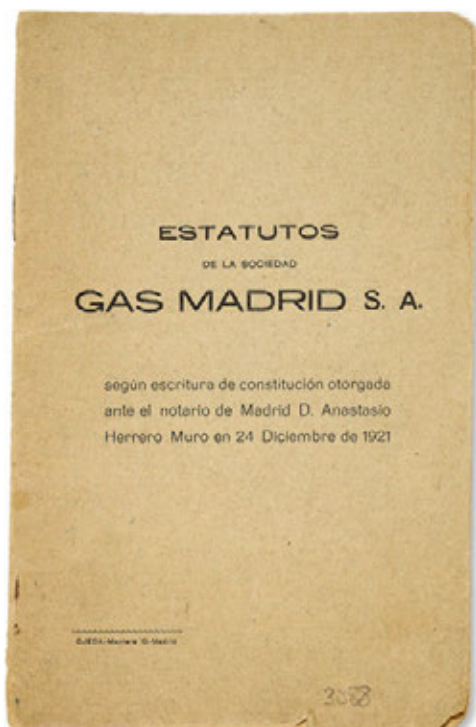
Deed of incorporation of the Central Catalana de Electricidad, 1896. Dani Rovira, 2018. Archive Naturgy.



Christmas greeting *El espitero de la Catalana del Gas*, ca. 1910. Archive Naturgy.



Minutes of the Board of Directors of the Sociedad General Gallega de Electricidad, 1900-1905. Dani Rovira, 2018. Archive Naturgy.

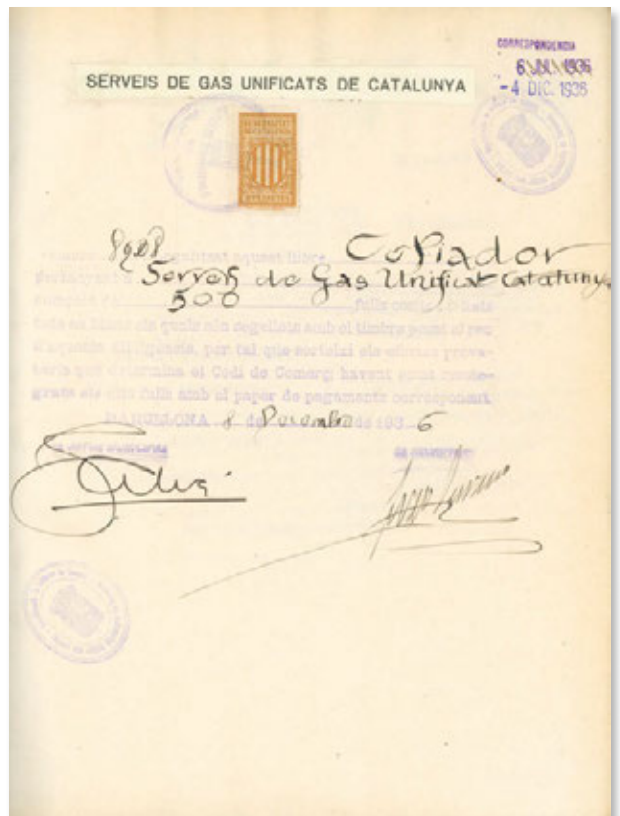


Statutes of Gas Madrid, S.A. from 1921. Dani Rovira, 2018. Archive Naturgy.



Deed of incorporation of the Sociedad Unión Eléctrica Madrileña, 1912. Archive Naturgy.

Adapted from an original drawing by
Joan Junceda, 1927. Archive Naturgy.



Document of the SGUC, 1936. Historical
Archive Naturgy.

Following page:
Street lamp designed by Antoni
Gaudí, ca. 1930. Archive Naturgy.

Manoteras gasworks [n.d.a.].
Archive Naturgy

ENLLUMENAT A BAIXA PRESSIÓ

MODEL N.º 30

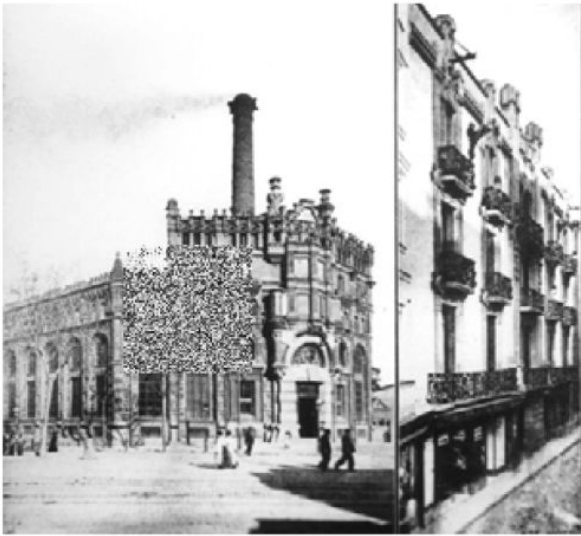
BEC: DE 5 CAMISETES

CONSUM: 280 LITRES PER HORA

INTENSITAT LLUMÍNICA: 280 BUGIES "HEFNER"

EMPLAÇAMENT: PLACA FRANCESC MACIÀ.





Central : : :
: : Catalana
de
Electricidad
* * * *
Barcelona



FABRICA: Calle Vilanova

entre el Arco de Triunfo

OFICINAS: Calle Arco, 18

entre el la Plaça de Santa Anna

Central Catalana de
Electricidad, early 20th century.
Archive Naturgy.

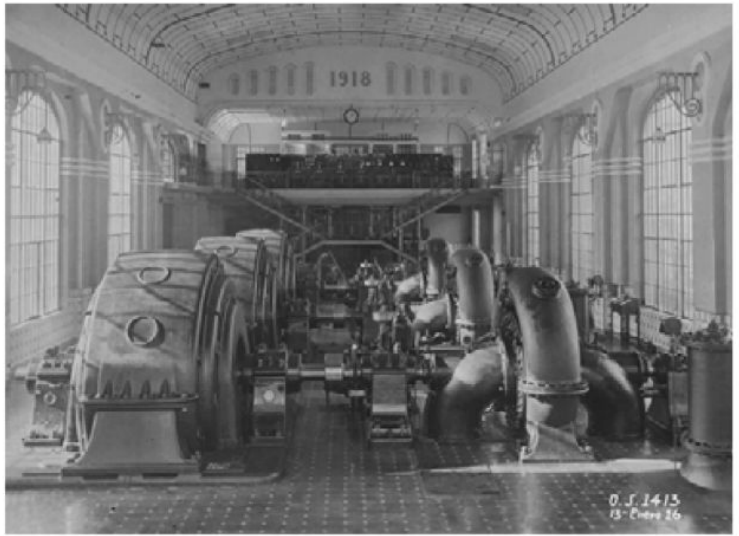
Bolarque Dam, 1911.
Archive Naturgy.



Thermal power plant
(Sant Adrià del Besòs), 1921.
Archive Naturgy.



Engine room at the Seira power station, 1926. Archive Naturgy.

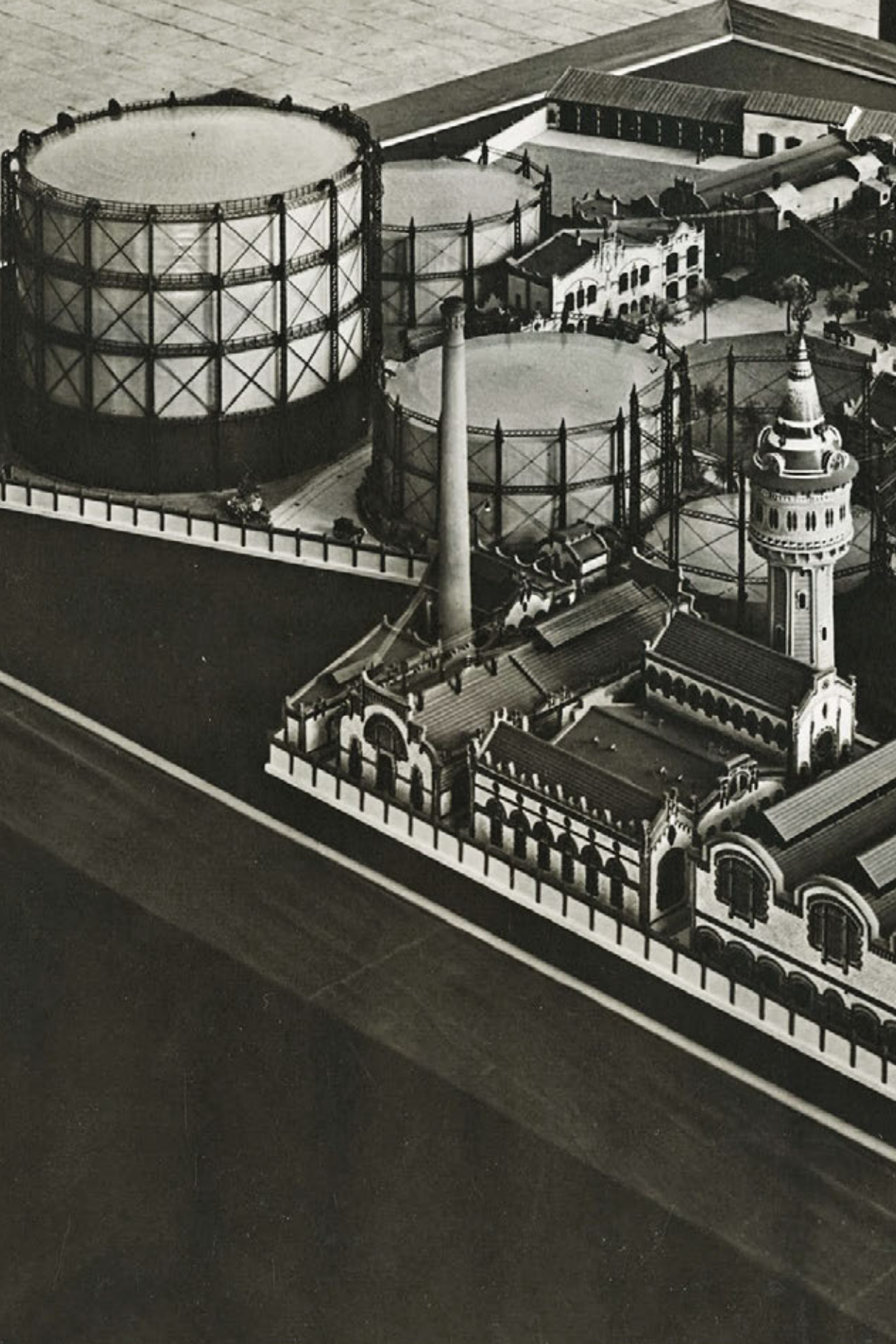


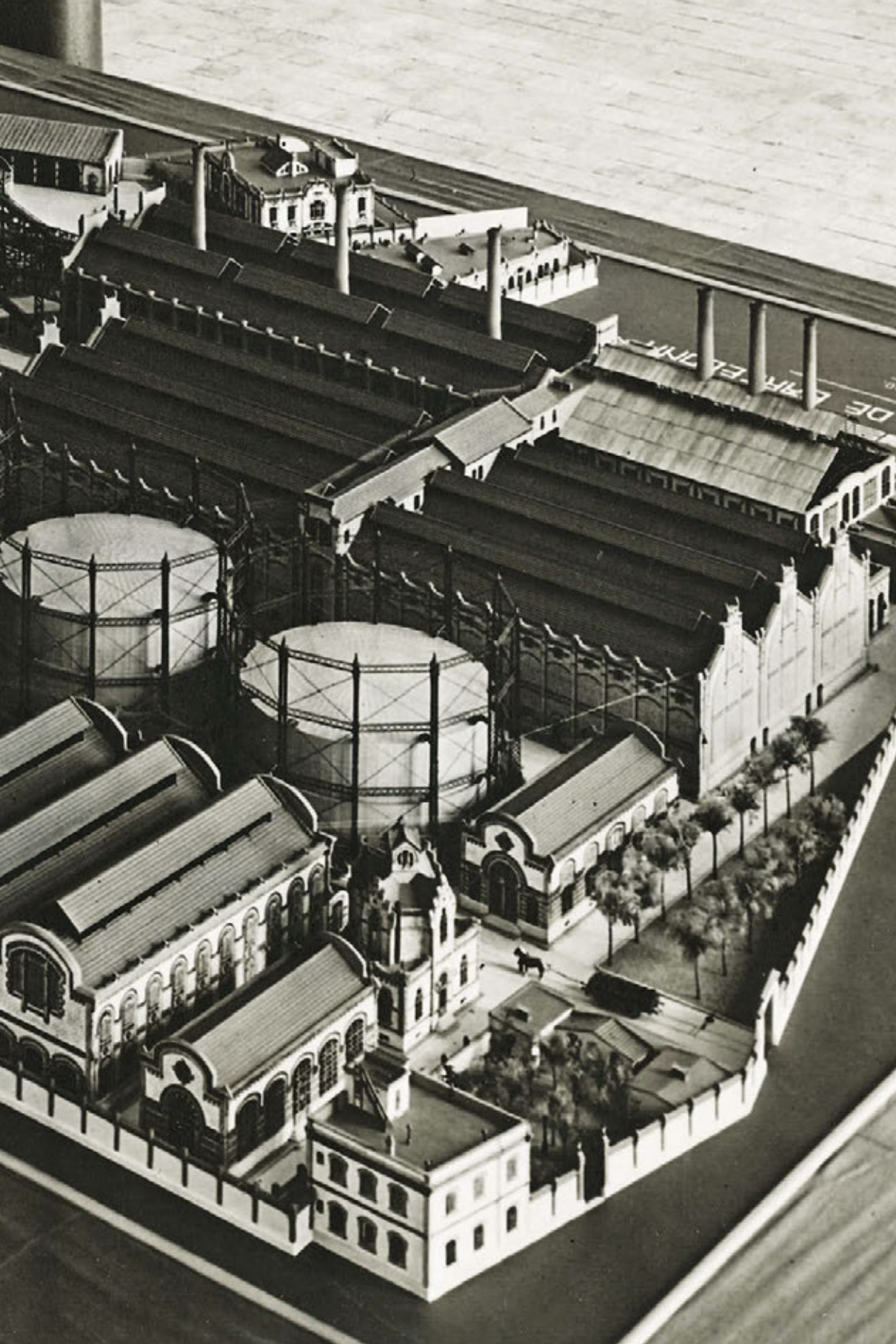
The Central Norte power station of the Compañía General Madrileña de Electricidad, 1898. Archive Naturgy

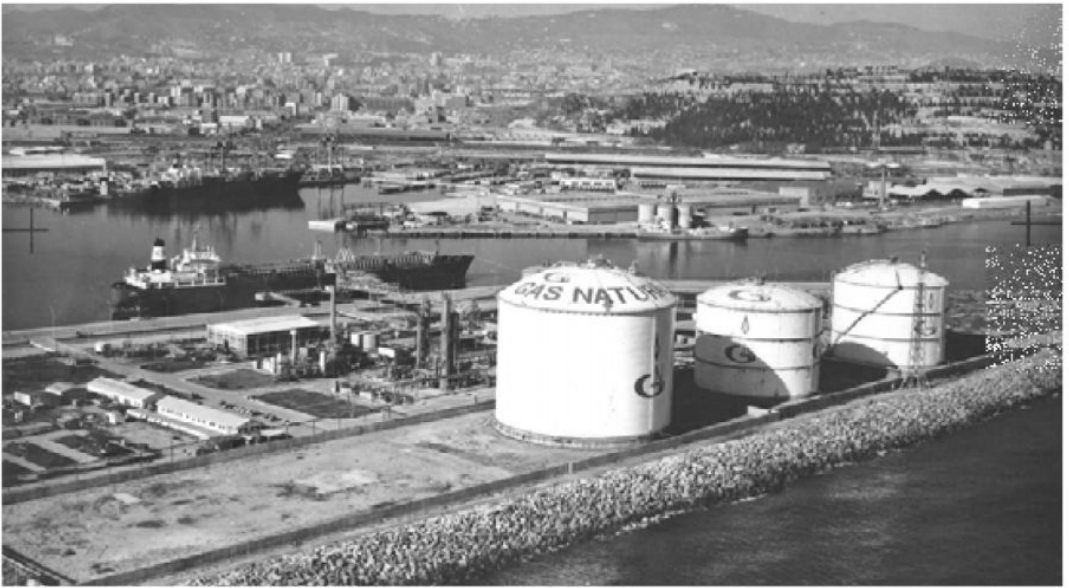
Partial view of the Barceloneta gasworks [n.d.a.].
Archive Naturgy.

Following pages:
Model of the Barceloneta gasworks, 20th century.
Archive Naturgy.







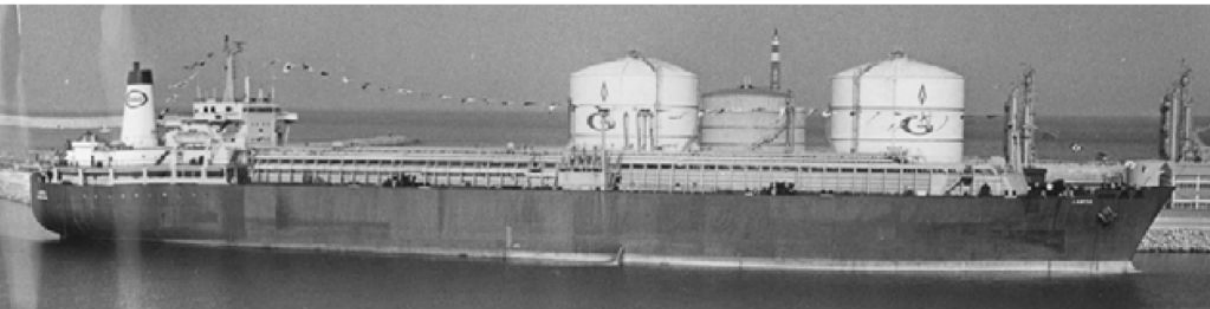


Above: Natural gas power plant in Barcelona, ca. 1960-1970. Archive Naturgy.

Centre: Trillo nuclear power plant, 2006. Archive Naturgy.

Below: Arrúbal combined cycle power plant (La Rioja), 2005. Archive Naturgy.





The Laidetà in front of the natural gas plant in Barcelona, 1971. Archive Naturgy.



Metanero Castillo de Villalba, 2003. Archive Naturgy.



Construction work on the Maghreb-Europe gas pipeline, 1996. Archive Naturgy.

Bii Hioxo wind farm
(Mexico), 2016.
Archive Naturgy.



General Rodríguez
Peak Shaving plant
(Argentina), 2012.
Archive Naturgy.





2018 General Shareholders' Meeting in Madrid. Archive Naturgy.

