

Gas heating and comfort in European middle-class homes: case study of the United Kingdom, France, and Spain (ca. 1850-ca. 1920)

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ABSTRACT: In the Second Technological Revolution, not only did the West see the development of new strategic industrial sectors, as chemistry, oil, and electricity, but it also witnessed the birth of competition between companies to reach a broader public. In the energy sector, gas companies, which had benefitted till then from monopolistic control of the market, saw the appearance of a fierce competitor: electricity. Therefore, they took the chance to get subscribers, linking their services to bourgeois comfort, which they unsuccessfully tried to extend to the working class. In order to do so, they developed relevant publicity campaigns, in which they insisted on the improvement of homes thanks to gas appliances. In this article, we study the marketing strategies that they deployed for expanding particularly the use of gas heating in Western Europe. We focus on the British, the French, and the Spanish case, as the three countries lived under different circumstances, and they consequently illustrate the different ways in which publicity, linked to gas, evolved.

KEYWORDS: energy; market; publicity; catalogues; brochures; press.

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RESUMEN: En la Segunda Revolución Tecnológica, los países occidentales no solo asistieron al desarrollo de nuevos sectores industriales estratégicos, como la industria química, el petróleo, o la electricidad. Además, se dio la competencia entre compañías rivales para llegar a un público cada vez más amplio. En el sector energético las compañías gasistas, que hasta entonces se habían beneficiado del monopolio del mercado, vieron la aparición de un fiero competidor: la electricidad. Así pues, buscaron tener más abonados, vinculando sus servicios a la materialización del confort burgués, que de manera ineficaz intentaron hacer extensible a la clase trabajadora. Para ello, desarrollaron importantes campañas publicitarias, en las cuales insistían en la mejora de los hogares gracias al empleo de gasodómesticos. En este artículo, estudiamos las estrategias de marketing que pusieron en práctica para extender en concreto el uso de calefacción de gas en Europa occidental. Nos centramos en los casos de Gran Bretaña, Francia y España, porque los tres países atravesaban por coyunturas distintas, y en consecuencia ilustran la diferente forma en que la publicidad, vinculada al gas, evolucionó.

PALABRAS CLAVE: energía; mercado; publicidad; catálogos; folletos; prensa.

INTRODUCTION

Gas industry started hand in hand with the Industrial Revolution, and it deserves the historian's attention. Due to its structural and globalising nature, its development activated other industrial sectors connected to it, such as mining, or the building of large, properly articulated railway networks. In addition, it acted as an engine to the European industrial take off. Its spread was possible thanks to British engineers, capital, technique, and infrastructure: they were essential for the awakening of the French gas sector, from where the new energy source irradiated to the rest of Latin Europe (France, Portugal, Spain, and Italy) (Fernández-Paradas *et al.*, 2022b). In the following years, engineers and producers used different strategies to get more consumers in the energy market, emphasising, for example, alternative uses of gas, different from lighting. This process ran parallel to the consolidation of liberal regimes in Europe, which also meant the coming to the forefront socio-political line of the European bourgeoisie. The latter was the class leading the continent's industrialisation, and it would look for turning its economic influence into political participation and social prestige (Hobsbawm, 1962, pp. 22-43; Clendinning, 2016, pp. 84-151). Linked to the bourgeoisie, who would reach a main position in liberal society by the mid-19th century, namely after the 1848 revolutions, was the concept of "comfort," which they had started to use in a modern sense by early 18th century.

As Witold Rybczynski argued, in 18th-century Europe houses did not only offer shelter and protection against intruders, as before. Besides, they became the place where a new social unit, the family, would carry out its daily activities. Family life implied a certain degree of social "isolation," but it also implied intimacy and domesticity. Thus, it led to the bourgeois idea of comfort (Rybczynski, 1991, pp. 85-100). Quoting Jacques-François Blondel (1737-1738), we can define "comfort" as proper and/or convenient for human use. Apart from being aesthetically beautiful, home furniture and appliances had to provide for the improvement of the family's domestic life. According to this principle, rooms had to be divided into three categories: respect rooms (*appartements de parade*), reception rooms (*appartements de société*), and comfort rooms (*appartements de commodité*). Visitors rarely had access to the latter, conceived for the family's private activities. These are the places where comfort had to be specially implemented. For example, linked to the title of the present research, since the 1720s, in comfort rooms, they built chimneys with better draft: this eliminated fumes, and improved combustion, turning them into heating devices. This way, comfort rooms were warmer in winter, for the family to sit around in them to pass free time.

One hundred years later, gas companies joined in the effort, insisting on the connection between comfort and gas lighting, as well as gas heating and gas cooking. In the end, they generated the illusion that domestic gas appliances meant comfort, and therefore happiness at home. Besides, they worked very hard to encourage all bourgeois families to get gas appliances, as well as a gas supply, which they depicted as an indicator of social prestige, within the house, and for outsiders (Rybczynski, 1991, pp. 85-99). In years to come, middle-class and high-class bourgeois would try to emulate that lifestyle, providing companies with more clients. Using these strategies, gas companies dominated the energy market until the last quarter of the 19th century, when electricity appeared to compete with gas (Mirás Araujo, 2017; Giuntini and Williot, 2023). Fearing that the energetic monopoly was approaching the end, and aware that they could not confront electricity, which was cheaper and reached broader areas of the territory, often where gas could not arrive, gas companies insisted on the aforementioned strategies to get more consumers. In addition, they now tried to persuade lower-class bourgeoisie, and even the working class, that they could benefit from their services, too (Fernández-Paradas *et al.*, 2022a; Fernández-Paradas and Rodríguez-Martín, 2022).

In the present article, our first goal is to study different marketing tools that they used to reach a broader public, such as catalogues, adverts in the press, pamphlets, reports, etc., in the United Kingdom, in France, and in Spain. Our second goal is to carry out an analytical description of the latter. The examples taken from the British and the French scenario date back to the 1870s-1890s, whereas the Spanish documents are from the 1920s. The illustrations, brochures, advertisements, and other materials included in our analysis, are the corpus that we have gathered, as a result of the research fellowships mentioned under "Funding Sources," as well as the research project in which we participate, with funding by the Spanish Ministry of Science and Innovation. Though they may seem limited, we have chosen them because the elements they present illustrate the strategies that gas companies performed throughout Latin Europe between 1850 and 1920. Our third and final goal is to frame these publicity campaigns within each country's economic context, in order to determine whether they were realistic. Moreover, we will see how foreigners saw those strategies, from the scope of United States consuls in the three countries.

The reason for such a large time framework is that the spread of the gas industry in the Spanish energy market was limited until the early 20th century, and the appearance and diffusion of electricity also came later, compared to the other two countries. Also, the study starts in the second half of the 19th century, when the European bourgeoisie had become the new ruling class, and it extends up to the 1920s, when mass production had consolidated in the European economy, as Fernández-Paradas and Rodríguez-Martín (2022) argued. From a methodological scope, ours is a research of social history, focused on marketing and publicity campaigns in the Western European energy market. We consider the social groups they regarded as their target, and the resources they used to get the latter's attention. Likewise, it is a study of cultural history, which explores the spread to other social groups of a bourgeois ideal of comfort at home.

Our article insists on a topic that other scholars have previously analysed. For instance, Fernández Paradas and Rodríguez Martín (2022) have addressed the marketing strategies that gas companies developed in France, Portugal, and Spain during the 1930s, emphasizing the use of gas for cooking. Luque García and Pinto Tortosa (2023) have already addressed the subject, focusing on a smaller corpus of sources and original documents, mainly written publicity. In their work, they provide a general description of the elements considered. Therefore, the current research aims to achieve broader results, including more elements of analysis. Moreover, the latter authors make some inaccurate historical and economic assumptions that we will discuss in the following pages.

HISTORICAL AND THEORETICAL FRAMEWORK

Birth of the gas industry

The exploration of new energy sources for industrial uses happened at the same time as the European industrial take-off, at the turn of the 18th century. Great Britain, the heart of industrialisation, led the process: initially, it produced gas by burning coal. William Murdoch pioneered the use of gas lighting in 1792; seven years later, French entrepreneur Philippe Lebon followed his example in Paris. The first cases of gas lighting were experimental, limited to small buildings and homes, and they generated it in very conventional ways. Thus, results were limited in scale, too. A relevant change, in quantitative and qualitative terms, happened thanks to German-born Albrecht Winzer, later Frederick Winsor. Observing Lebon's designs, Winsor decided to build larger gasworks. His aim was to generate bigger amounts of good-quality gas, to supply larger areas and more clients. Murdoch, on the one hand, remained loyal to his small-scale production model, so his reach was much smaller. Winsor, on the other hand, evidenced a more competitive business perspective, and he soon demanded a patent for coal gas production in the United Kingdom. His business grew in the first decade of the 19th century, and consequently, in 1812, he founded *Gas Light and Coke Co.*, the first big-scale European gas company (Thomas, 2014, pp. 4-6; Fernández-Paradas and Pinto Tortosa, 2021a). By 1846, all British villages over 2,000 inhabitants had gas lighting (Sudrià, 1983, pp. 97-102; Fernández Paradas, 2009).

Soon, gas technology turned oil lighting obsolete, so European main cities, and those in the United States, had gas lighting, regarded as a symbol of modernity. In Europe, France followed the steps of Great Britain: Paris authorities inaugurated the city's gas lighting in 1818, and the new lighting system spread to other French cities in the 1820s and 1830s. Urban reconfiguration and renewal during the Second French Empire (1852-1870) brought a second golden age for gas lighting, which by 1891 had reached all municipalities over 20,000 inhabitants (Williot, 2005; Martínez-López and Mirás Araujo, 2021). Unlike France, Spain saw a slower, more difficult, and more limited implementation of gas lighting. The first experiences of the kind date from the 1820s, but gas production for industrial uses did not happen until 1841, when they inaugurated Barcelona's public gas lighting. Late development of the industry in this country was due to a combination of difficult circumstances: Spain lacked a modern communication network, to enable coal transportation from mines and from ports to factories; linked to that, it was very complicated to supply with gas lighting municipalities and villages far from train stations and/or railway facilities; finally, average per capita income was low, compared to that of other Western European countries.

Therefore, industrial take off in the gas sector occurred later than in the rest of the region, and the energy source could neither compete with electricity, which appeared in the Spanish context in the 1880s, nor with traditional heating sources, namely firewood and coal. Taking firewood first, in 1860, it is estimated that total firewood consumption per capita, and per day, in Spain rose to 3.10 kilograms. In fact, by that year, only 13% of the Spanish people had access to new energies (gas), and in 1910 figures rose to only 43.70% of the Spanish people. More than half the citizens were still using firewood for lighting, cooking, and heating. Firewood consumption grew even more between the 1910s and the 1950s, probably due to the problems associated with coal supply in the Spanish energy market, in the context of the First World War, the Interwar Years, and the Second World War (Infante-Amate and Iriarte-Goñi, 2017; Iriarte-Goñi and Infante-Amate, 2019; Muñoz-Delgado and Rubio-Varas, 2024). Spanish per capita income was also low, contributing to the explanation of the phenomenon. In the case of gas, taking Sudrià's figures (Sudrià, 1983, pp. 108-109), the number of Spanish gasworks in 1901, 81, was more than three times the amount in 1861, 25. By the early 20th century, the Spanish gas sector produced 105.8 million cubic meters.

The numbers are rather humble, compared to Great Britain and France, which were producing 4,000 million, and 900 million cubic meters, respectively. Sudrià explains the Spanish situation underlining the lower income rate in the country: though gas prices were not much higher than in other European states, most homes could not afford them. Coll Martín and Sudrià i Triay (1987, pp. 14-71, 303-332, 358-370) previously focused on sectoral distribution of coal consumption, between 1861 and 1935 (Coll and Sudrià, 1987, p. 359). In this case, we must pay attention to domestic consumption, as it implies the use of coal for lighting, heating, and cooking, as shown in Table 1.

In 1861, gas factories consumed around 100 thousand tons of coal. Domestic consumption is included in "other uses", among them mining, sugar production, or making cement, glass, paper, or ceramics. It amounts to 76.8 thousand tons (out of 950 thousand tons consumed in the country). In 1870, domestic consumption represented 50 thousand tons, compared to the 100 thousand tons devoted to gas factories (out of 1,228.9 thousand tons consumed in the country). In the following years, domestic consumption would always be over the amount of coal consumed by gas factories; for example, in 1924, Spanish homes used 1,400 thousand tons, versus 400 tons employed at gas factories (out of 7,500 thousand tons consumed in the country). According to these figures, coal gas production would stay stable in the first quarter of the 20th century, while electric production increased, at least for public lighting. By 1901, only 72 cities had gas lighting, compared to 571 with electric lighting (Sudrià, 1983; Martínez López and Mirás Araujo, 2018; Fernández-Paradas and Rodríguez Martín, 2022). Meanwhile, Spanish homes still used coal for lighting, alongside firewood.

TABLE 1. Distribution of coal consumption in different industrial sectors (in thousand tons). Source: built from Coll Martín and Sudrià i Triay (1987, p. 359).

Sectors	1862	1870	1890	1894	1924	
Railway	163.2	173.0	230.0		1,600.0	
Sailing	100.0	125.0	285.0	200.0	830.0	
Gas	100.0	100.0	400.0	240.0	400.0	
Electricity	-	-	50.0		350.0	
Building (metallic)	360.0	450.0	1,100.0		1,500.0	
Iron and still industry				592.0		
Metallurgy (not iron)				357.0		
Mining	76.8	210.4	915.4		250.0	
Sugar					450.0	
Cement						
Glass					300.0	
Ceramic						
Paper						
Others						220.0
Chemistry				150.0		
Textile		120.5				
Domestic use	(Included in "others")	50.0	250.0		1,400.0	
OVERALL	950.0	1,228.9	3,320.4		7,500.0	

Gas companies and producers started to develop alternative uses of that energy source even before alternative sources appeared. In fact, as early as 28 September 1799, Philippe Lebon himself had patented the thermo-lamp. In 1805, Frederick Winsor tried to implement domestic gas heating, and also in the British context, Richard Barnes (1833) and Hadden & Johnson (1838) worked in the same direction (National Commercial Association, 1914). Nevertheless, technical innovations in gas heating would have to wait until the 1850s, when they developed significantly. They still presented relevant technical handicaps, though, that were only overcome in the last thirty years of the 19th century. Central heating would play a secondary role in the following decades, as consumers preferred coal or coke as fuel, and firewood, until the 1920s (Alayo Manubens and Barca Salom, 2011). In that sense, the behaviour of British and French domestic consumers did not differ much from the Spanish ones.

Moreover, in order to be integrated into economies of scale, coal gas heating had to struggle against a major enemy: popular distrust. People believed that the risk of gas leaks was so high, and that accidents and explosions were so likely to happen, that coal gas heating was not worth it. Engineers, technicians, and company owners tried to fight these views by publishing instructions, pamphlets, catalogues, and brief essays where they summed up the advantages of gas, proving wrong all prejudices against it. This is what happened, for example, in Spain: in 1849, when gas lighting started to be produced in different gas works, engineer Melitón Martín Arranz, in charge of the Madrid factory, published *Cuatro palabras a los consumidores de gas* (Martín Arranz, 1849; Fernández-Paradas and Pinto Tortosa, 2021b).¹ That was also the intention of J.O.N. Rutter, author, in the previous decade, of *Advantages of Gas in Private Cases*, in which he addressed the pros and cons of gas lighting, heating, and cooking (1836).

Up until the 1870s and 1880s, mainly in France and Spain, gas companies enjoyed a market monopoly. The circumstances, together with the lack of powerful competition from other companies, discouraged investment and technical innovation, leading to the sector's stagnation. The rise of electricity in the energy market transformed the situation: the former was cheaper and could supply larger regions. Gas companies felt the urge to implement technical innovations, developing marketing strategies to appeal to potential new consumers. Luque García and Martínez López (2025) studied the slow energy transition in the European market, focusing on the impact that competition between gas and electricity had on *Le Gaz Journal* in the last decade of the 19th century. Leaving the first experiments to produce electric lighting, by mid-19th century, aside, the 1870s marked a step forward in the new energy source. In 1876, Yablochkov invented the electric candle, which, combined with the Gramme dynamo, made possible the creation of the *Société Générale d'Électricité*, whose head office was in Paris, just before the opening of the Universal Exhibition in 1878.

Electric light was much brighter, so gas's smaller lighting power was clear from the start. Moreover, the urban changes that Napoleon III promoted in Paris, enabling larger public spaces, made gas lighting inefficient, in terms of consumption and cost. In less than two decades, gas companies had to struggle to confront the advance of electricity, developing innovations, in public areas, and at home. The process was slow, but thanks to these initiatives, domestic gas consumption

¹ *Four words to gas consumers* (translated by the authors).

grew significantly: in Paris, for instance, only 5% homes used gas as the main energy source in 1888; in 1905, figures rose to 66% (Chatzis and Coutard, 2005). Companies even offered clients the installation of gas pipes in their houses for free, and the *Parisienne*² organised workshops for clients, builders, and architects, to explain how gas appliances were operated (Williot and Paquier, 2005b, p. 59; Fernández-Paradas and Rodríguez-Martín, 2022). All the process must be framed within the aforementioned second golden age of gas energy in France. Potential consumers belonged to the urban bourgeoisie, but company owners intended to persuade the working class that it could also access the products they offered.

Reality differed from business interest, and the only social groups that incorporated gas at home were the aristocracy, the upper-class bourgeoisie, and the urban middle class (Fernández-Paradas and Rodríguez-Martín, 2022). However, the rise in domestic consumption was not due to the triumph of gas heating at home. The actual reason for the increase in subscribers might have been the diffusion of private gas lighting, thanks to the development of modern burners, with bigger lighting power, and lower energy consumption. Likewise, the spread of supply networks to urban peripheries contributed to the transformation. It is very difficult to determine the uses of gas at home until the second half of the 20th century, as we do not have detailed statistical analysis that distinguishes between gas lighting, gas cooking, and gas heating, as seen in the Spanish case (Tab. 1). In addition, though the competition of electricity pushed gas companies to develop gas heating, both technically and commercially, it had difficulties in dethroning solid fuels, such as coal and firewood, much more demanded by the people. In 1906, for example, a statistical study on domestic equipment in France, carried out on fifty towns and villages, concluded that 76% French homes still had a chimney. Half a century later, in 1954, another study pointed out that only 37 homes out of 1,000 had gas heating, whereas 700 used coal and firewood for that purpose (Viguié, 2024, pp. 38-39).

That is why the first gas heaters imitated the design of conventional chimneys and heaters, so they could be put in the fireplace, and contribute to the aesthetic decoration of the house. They were functional, handy, and they did not take up that much space, but they created two problems: firstly, coal gas generated fumes that had to be evacuated, as they were harmful to human health; secondly, the heat they generated could only be felt in the room where they were placed. The first problem was solved easily, as the chimney fireplace was used to evacuate the gases. The second one was more complex. Since the 1850s, while gas companies were developing heaters and stoves, they also started working on central heating. There was a wide range of prototypes: some distributed warm air, steam, and hot water through pipes. The fuel used could be gas, coal, or firewood. Public buildings and luxury hotels welcomed that kind of central heating, but it could not be easily applied to blocks of flats and apartments, as the system was expensive, and therefore not accessible to the people who lived there. Besides, the installation of boilers in building basements was not popular. Thus, central heating did not develop until the 1920s (Alayo Manubens and Barca Salom, 2011), as we have previously argued.

State of the art

In the last two decades, several research works have appeared in the field of energy history, in general, and of the gas sector, in particular. Up until the 2000s, most books, journal articles, and/or chapters showed either a national, a regional, or a local perspective. Yet, there are some relevant works written from a transnational scope in those years, among them *L'industrie du gaz en Europe aux XIX^e et XX^e siècles*, by Serge Paquier and Jean-Pierre Williot (2005). Previous research had paid attention to electricity mainly, regarded as a key sector in the Second Industrial Revolution. In 2018, a more recent book emphasized the role of petrol in European industry, from the 17th century till the present: *The history of European oil and gas industry (1600s-2000s)* (Craig *et al.*, 2018). Within it, Russell Thomas (2018) explored the evolution of the gas sector in Western Europe, and Franco Cazzini (2018) devoted a chapter to petrol and gas in Italy.

Southern European, and Spanish, historiography has produced relevant works on this topic, too. In the 1980s, Antonio González García (1981) approached the case of Seville, and Dionisio García de la Fuente (1986) studied CEGAS, later “Lebon et Cie.,” the most relevant foreign gas company in Spain (Fernández Paradas, 2020). In the late 1990s, García de la Fuente (1996, 1998) himself analysed the implementation of gas in Granada and Castellon, while Mercedes Arroyo (2003) focused on Barcelona, and Pere Fàbregas (2003) turned to the gas sector in Malaga. Since 2000, scholars have paid special attention to it in Latin Europe (Matos *et al.*, 2023): this region includes Spain, Portugal, France, and Italy, from a globalising and comparative perspective, far from previous local studies.

For instance, Ana Cardoso (2017) has discussed the implementation and development of the gas industry in Spain and Portugal, between the mid-19th century and the 1950s. Alongside Mercedes Fernández Paradas and Nuria Rodríguez Martín, she has explored the negative impact of the Great War on gas supply in Lisbon and Madrid (Cardoso *et al.*, 2020). The Second World War also had dramatic effects on the industry, as Fernández Paradas and Martykánová (2017) underlined, in the French, the Italian, and the Spanish market. The works listed focus on the start of the gas sector in Southern Europe, from an economic perspective, following its evolution since early industrialisation until the mid-20th century. Other elements linked to the use of gas have deserved the historian’s attention in recent times. For example, the political impact of the use of gas lighting, as a way to promote the city’s (and the country’s) modernisation, as well as to celebrate relevant political events, has been addressed by Antonio R. Fernández Paradas and Nuria Rodríguez Martín (2023).

The latter includes cultural implications of the use of gas energy in urban society, a topic on which Rodríguez Martín has published other relevant papers. In a recent article, Rodríguez Martín and Mirás Araujo (2024) emphasised the need to focus on new aspects related to gas energy, among them the use of marketing tools by gas companies to compete with

² Short version for *Compagnie parisienne d'éclairage et de chauffage par le gaz*. It was the main gas supplier in Paris at the time.

electricity. Publicity campaigns by gas companies have also focused Rodríguez Martín's attention on a comparative study between France and Spain, carried out alongside A. R. Fernández Paradas and F. Moyano. They address the 1890-1918 period (Fernández Paradas *et al.*, 2024b). The relevance of these studies is undeniable, and is linked to the interest of the present research: on the one hand, they emphasise the social and cultural reverberance of publicity at the time. In that regard, they describe the elements included in brochures, advertisements, posters, etc. Their goal is to appeal to the interests and the potential needs of the urban bourgeoisie, the main social target of gas companies. For later periods, namely the First World War and the Second World War, we can also count on the works by Fernández-Paradas, Martínez López, and Mirás Araujo (2023, 2025).

On the other hand, they often undertake a comparative analysis of national scenarios different from each other, with varying historical rhythms in the incorporation of new energy sources, too, as in the case of France and Spain. When it comes to studying the alternative uses of gas that companies were promoting, in order to confront the competition of electricity, the scope of most research is reduced to the use of cooking gas appliances. Likewise, they analyse the publicity campaigns aimed at promoting the use of such appliances (Fernández Paradas *et al.*, 2024a). These are the reasons why we have chosen, as our research topic in the current paper, the design of marketing campaigns for encouraging the use of gas heating appliances at home, in the United Kingdom, France, and Spain. Firstly, the countries included represent different development levels in the industrial world, as a whole, and particularly in the energy sector. That explains the different time periods considered for the study of each one of them.

Despite the aforementioned differences that the three states showed at the time, we are persuaded that the elements included in our research will contribute to a better knowledge of the evolution of their gas market. We will determine whether they were totally different from each other, or if it is possible to identify some common trends between them. Secondly, a former interest in gas cooking appliances leaves an open field for future approaches to the gas sector: gas heating. In our case, turning the researcher's attention to the latter, we will have a more accurate perspective of the different, alternative uses of gas at home, and of the success achieved in each case. Therefore, our article continues the historiographic trend that research on the gas sector has followed in the last twenty years, and adds new elements for discussion. At the same time, it profits from previous findings, and aims at filling the vacuum in the exploration of marketing strategies to promote domestic gas heating. It also evaluates the global impact of gas heating, and of publicity linked to it, on bourgeois circles, and beyond.

HEATING... FOR EVERYONE? CASE STUDY OF MARKETING STRATEGIES FOR COAL GAS HEATING IN THE UNITED KINGDOM, FRANCE, AND SPAIN

Competition tools within the energy market

In the first half of the 19th century, the gas energy market was practically limited to public lighting (Arroyo, 2003). Private consumption grew slowly, and it even had a marginal role in energy production and consumption at home, in the first stage of implementation of this energy source. Business people linked to the sector, like George Barlow, editor at the *Gaz Gazette*, lamented the circumstance.³ Work centres, factories, coffee houses, shops, casinos, hotels, and theatres were the first places to incorporate gas for lighting, heating, and cooking. Work sites, for example, used gas lighting in order to enlarge the working day, increasing production. As for hotels, coffee houses, casinos, shops, etc., they used it as a symbol of modernity and of high social status. People who belonged to the middle and high classes attended them (Williot and Paquier, 2005a). On the one hand, the monopoly that gas companies enjoyed discouraged technical innovation, as well as lowering prices to make the service more competitive. Actually, we know that companies prioritised high benefits to a service of better quality, in Great Britain and in France (Goodall, 2002; Williot and Paquier, 2005b).⁴ On the other hand, prejudices against gas survived: potential consumers were afraid of leaks, of toxic substances in the air they breathed, and of the risk of explosion. Moreover, from an aesthetic perspective, they sustained that the gas blackened the house ceiling (Arroyo, 2003).

Nevertheless, its depiction as a luxury persuaded aristocratic and bourgeois families to use it at home, for lighting, heating, and cooking, at the ground floor initially. Technology to supply upper floors with gas, too, would not develop until the end of the century (Williot and Paquier, 2005c). In spite of the companies' efforts, private gas consumption almost did not grow: in 1880, Paris had 2 million inhabitants, but only 50,000 were domestic gas consumers (Beltran and Williot, 2009, p. 64). Therefore, the gas sector had to work hard to confront electricity, which appeared in the energy market in the 1870s and 1880s: first in lighting, thanks to the invention and spread of the Yablochkov candle, and of the incandescent light bulb, respectively, as we have previously mentioned. Technology linked to electricity progressed slowly initially, but its development accelerated, benefiting from common regard to electricity as a modern energy source, which was meant to substitute gas soon (Durand, 1859, pp. 1 and 31). In addition to the rise of electric companies, gas suffered from a decay in its prestige, as a consequence of several accidents, fires, and explosions that occurred in the same years, known to the public thanks to the press. Such accidents in European big theatres, concert rooms... particularly shook the elites' opinion and positioned them against gas.⁵

³ *Gaz Gazette* [GG], 10 May 1847.

⁴ In France, *Le Gaz Journal* reported the consumers' dissatisfaction with the services of the *Compagnie Parisienne*, whose service had clearly decayed.

⁵ *Le Gaz* [LG], 15 March 1879.

Given the circumstances, in material terms, gas could not compete with electricity, which was cheaper and more accessible to the general public, at least in lighting. It would overthrow gas at the head of the energy market by the First World War. Hence, gas companies chose to apply technological innovations, together with marketing strategies, to get more clients (Fernández-Paradas and Rodríguez-Martín, 2022). The implementation of prepaid gas counters also attracted middle-class consumers (Wilson, 1993). In this context, marketing campaigns were crucial: at the same time that they tried to teach people the new uses of gas, fighting prejudices, they intended to create the necessity in potential consumers to buy and install gas appliances at home. They linked those appliances to the acquisition of certain values and social status. Home warmth in winter was depicted as a typical bourgeois element, and gas appliances were described as a clean and fast tool for producing heat, compared to solid fuels that took a long time to heat up rooms. Likewise, they stained the walls, ceilings, and furniture.


The effort that companies made contributed to the perfection and professionalisation of publicity and marketing (Beltran and Williot, 1993, p. 64; Chessel, 1998). In 1908, British engineer T. E. Pye, chair of the Chichester gas company, gave a talk to the members of the Southern Association of Gas Managers and Engineers, insisting on the industrial sector's need to use publicity for its own benefit. He distinguished between written and non-written publicity: the first one, he argued, summed up the material and technical features of gas appliances, in different types of press ads, pamphlets, and catalogues; the second one used mainly images to appeal to the observer's senses, and was therefore the field where gas companies unfolded a broad range of commercial strategies.⁶

We start our analysis with written publicity, focusing on brief essays and informational treatises. Among them, we highlight: *Advantages of Gas Light in Private Houses*, by J. O. N. Rutter (1836), and *The Domestic Uses of Coal Gas*, by William T. Sugg (1884), in Great Britain; *Guide de l'abonné au gaz d'éclairage*, by Émile Durand (1859), and *Guide du consommateur de gaz*, by the Marseille gas company (1891), in France; and finally, *El gas aplicado a la calefacción y a la cocina. Perfección, rapidez, limpieza y economía* (1893), in Spain. Alongside the mentioned essays and treatises, we also pay attention to the materials published in the British journal *The Gas Engineer* between 1878 and 1879. In general, potential recipients of these works were well-off urban consumers.

This kind of publicity uses an educated language, and it usually mentions historical factors, as well as technical and scientific facts, including almost no images at all. In this case, instead of looking for “converting” non-consumers of gas, it seems like their message is intended to provide information to an already informed public, fighting back prejudices and distrust towards gas. Among the most repeated messages, there was the insistence on the fact that gas was indeed more expensive, but consumers could regulate it. It turned off instantaneously; its use allowed house servants to make the best of their work time; it did not produce harmful fumes; and it avoided the inconvenience associated to conventional ways of heating and cooking (noises, dirt, etc.), among them transportation, storage, and burning of coal and/or firewood. Besides, in damp weather regions, gas-heated rooms were more comfortable, and contributed to the house's modernity (Luque García and Pinto Tortosa, 2023).

Rutter (1836, p. 8) identified the social groups that could use gas in their kitchens, reading rooms, etc.: “nobles, judges, magistrates, bankers, merchants, physicians, surgeons, and the members of all the other learned professions...” The same idea appeared in the *Gaz Gazette* in 1847.⁷ Yet, such essays and treatises had a limited reach, and company managers tried to diversify their commercial strategy. In 1878, editors of *The Gas Engineer* published some articles where they warned about how much common citizens still ignored about gas's heating power and uses. So, they concluded, addressing publicity and didactic pieces to a broader public was required.⁸ This was the departure point of the appearance of gas publicity in the mainstream press. It usually consisted of short pieces, which summed up as much information as possible about certain products. At first, these pieces had only text, but in the 1880s, they included images, too, though they would still play a secondary role for some years, as can be observed in Fig. 1.

IMITATION WOOD FIRE.



The above drawing represents a new Gas Fire, composed of Imitation Logs of Wood, made of Fire-clay. The Gas burns from small perforations in the Logs, and has, when alight, all the appearance of burning logs. They may be used in any fire-place, or can be supplied fitted to Stoves.

No. 750	...	...	8 inch	...	...	30/-
,, 751	...	...	10 inch	...	...	33/9
,, 754	...	...	12 inch	...	...	37/9
,, 756	...	...	15 inch	...	...	45/-

JOHN WRIGHT & Co., ESSEX WORKS, BIRMINGHAM.

FIGURE 1. Publicity in mainstream press. Source: TGE, January 1, 1877.

⁶ *Journal of Gas Lighting [JoGL]*, 10 November 1908.

⁷ *GG*, 10 July 1847. The journal mentioned Queen Victoria among the users of domestic gas.

⁸ *The Gas Engineer [TGE]*, 1 August 1879.

The most relevant element of this Illustration is the text. Editors of *The Gas Engineer* included this advert by John Wright & Co., Essex Works, Birmingham. It highlights the main advantages that the heating device, “Imitation Wood Fire,” offered to the public. The reader needs to pay attention to the description to find out what the new heating stove is about: a design that imitates traditional fireplaces, with firewood made of fire-clay. On the fire-clay-made logs, perforations can be found to allow gas flow. Once the device alights, the effect and the appearance are those of traditional firewood fireplaces, fed with logs. Different designs, with different proportions, are sold, to fit all fireplaces in almost every wealthy home. The announcer admits that the image is a drawing, in which it is very difficult to realise the details of the design of the heating device. This shows how, as we have argued, initially images were not the key element in publicity campaigns. It also evidences the kind of public at whom these campaigns were aimed: the well-off, educated urban bourgeoisie, interested in technical information, and also in aesthetic aspects, though the latter were secondary, for the time being. Hence, Figure 1 is an example of gas publicity halfway between written and non-written advertisements, considering Pye’s aforementioned categorisation.⁹

We can find similar examples that stay in the same intermediate position. Drawings and illustrations would become much more important in pamphlets, brochures, posters, and elements of this kind (postcards, calendars, etc.). Unlike essays and treaties, the latter examples of publicity have barely survived the pass of time, as they can be preserved only with difficulty, given their ephemeral nature in most cases. Brochures were very popular: they were regarded as simple publications, with a direct message, that combined text and images. Concerning domestic stamps, they described home scenes, in which conventional, middle-class families were depicted, in different situations: sitting around a gas light, chatting; using their gas cookers; or sitting next to a gas heater or chimney. Figure 2 shows a woman, apparently a family mother, turning on a gas heater to welcome a girlfriend visitor. At the foot of the image, the text warns that gas is not only useful for lighting the house: it also warms the rooms, in a way that the announcer defines as “intelligent.” Compared to firewood, which produces disgusting fumes and alights when it pleases, producing more heat than clients may wish, gas heating stoves are much better. They can be activated by opening a key on the wall, they can be regulated “at will” when visitors come, and they can be put down when they leave. The latter is relevant, as it fosters energy saving, and allows the family to cut down energy expenses:



FIGURE 2. Brochure highlighting the advantages of gas heating. Source: “Le gaz chez soi,” Imagerie Pellerin. Undated. Quoted in Mustar (1984, p. 101).

⁹ *Journal of Gas Lighting [JoGL]*, 10 November 1908.

As for the image, apart from the brief description already provided, two more things must be said. First, observing the furniture of the room depicted it is easy to realise how gas companies, regardless of their wish to spread the use of gas domestic devices to everyone, always recreated bourgeois and/or aristocratic houses. Therefore, their “globalising” view of consumer society did not go hand in hand with the language and the symbols they used, far from the working class, and close to the ruling elites. Second, the two characters included in the image are women, which suggests a special attention to the female public. Women were seen as “demons of domesticity” (Clendinning, 2016), so many of these messages were addressed to them, as they could persuade their husbands, companies thought, to acquire gas domestic appliances.

In Spain, in 1927, they celebrated the 1st Exhibition of Hotel and Food Industry, organised by Catalana de Gas y Electricidad. To commemorate the occasion, they published a 32-page brochure. The document insisted on the economic advantages of domestic gas, compared to conventional lighting, cooking, and heating procedures, in terms of expenses and energy efficiency. It went on to promote the use of gas cookers, and gas heaters were only mentioned shortly. The images exaggerated the inconvenience of using solid fuels at home, such as coal and firewood, for cooking and heating. We can observe all these elements in Figure 3.

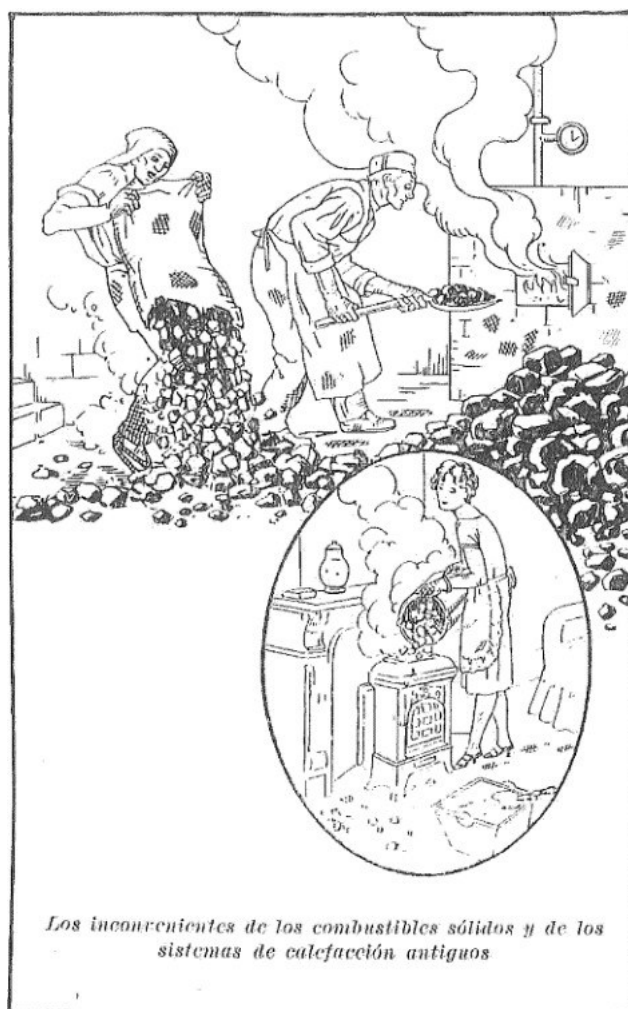


FIGURE 3. Inconvenience of conventional heating devices (coal). Catalana de Gas y Electricidad (1929).

In this case, we find ourselves confronted with a more sophisticated type of illustration, which might fit into the category of “non-written publicity.” It represents two complementary realities, in two overlapping images. In the background, we find a picture that the reader must regard negatively at first glance: a compendium of the disadvantages of solid, fossil fuels at home. Two workers are depicted at the house’s basement, where the coal boiler is. One of them throws the content of a coal bag on the ground, where coal falls in a chaotic way, taking (and dirtying) the whole floor. The other man feeds the boiler with coal, using a spade. Both men have hard faces, and they are sweaty and dirty. The message is clear: solid fuels require large storage rooms, produce disgusting odours, generate dangerous fumes, and take a big effort to be transported and stored. The latter elements go together with the supposedly anti-aesthetic impact of such dirty, unpleasant workers at home.

In the foreground, a woman feeds a stove with coal. The domestic atmosphere seems more peaceful, but once more the fumes leaving the stove, together with the bucket containing the coal, and the stains on the carpet, lead the reader to judge this heating procedure as negative. The former image represented a cellar of a big, aristocratic house. The latter illustrates a humbler home, but is also related to Spanish bourgeois, middle-class groups. Both cases are, again, far from working-class houses, and workers' acquisitive power. In the same way observed in French advertising, we insist on the distance between the companies' wish to include workers in the group of future gas consumers, on the one hand; and, on the other hand, the cultural symbols used, which do not connect with them at all. As can be observed, by 1920, Spanish gas publicity did not refer to domestic servants anymore, but to middle-class wives, in charge of household chores, according to the dominating, masculine mentality. Therefore, publicity insisted on the fact that gas appliances made it possible for Spanish women to be more efficient, enjoying more leisure time (Clendinning, 2016).¹⁰ Women were guardians of home intimacy and comfort. Apparently meant to spend more time at home, they had to create the perfect domestic atmosphere, and publicity would repeat this social cliché in the following decades.

Posters became very popular by the late 19th century, and are the perfect example of non-written publicity: everyone could see them, and companies used them as a tool for fictional social levelling, trying to convince everyone that they could buy the appliances and products announced. Persuaded of their relevance, entrepreneurs and business people looked for the collaboration of well-known artists, in order to create nice posters, aesthetically attractive, which called for the public's attention because of their beauty (Rodríguez Martín, 2016). The leading role corresponds to images, meant to act as transmission cables of the message. The text only clarifies and completes the graphic messages. Figure 4 shows an example of poster, which insists on the happiness that comes from using gas heating at home.



FIGURE 4. Mother and daughter warming themselves with a heating salamander. Source: Jules Chéret (1889) "La Salamandre, cheminée roulante à feu visible & continu. Magasin d'exposition et de vente 77bis rue Richelieu..." [Poster]. Bibliothèque nationale de France, département Estampes et photographie, ENT DN-1 (CHAIX)-GRAND ROUL.

¹⁰ Anne Clendinning underlines the paradox implied by this type of message, that promises more free time for wives, though the total amount of work they had to perform at home actually increased.

In this case, two female characters appear in the image: a mother and a daughter. Dressed up in clothes that suggest middle class, and even high class, they put their hands in front of a gas salamander, in the living room of their comfortable house. Their smile transmits happiness, associated with the comfort they enjoy at home. The text simply describes the device, a burning chimney with continuous fire; it tells the price, 100 francs; and it gives the address where such devices can be seen operating: the exhibition store in number 77 bis, Rue Richelieu (Paris). It is clear that images have the lead, and text plays only a secondary role (Rodríguez-Martín and Mirás Araujo, 2021).

We conclude this sub-section by analysing another kind of fully non-written publicity, according to Pye's categorisation.¹¹ Leaving political publicity aside, which would make us carry out a deep analysis of political connections of the gas industry, we must mention didactic publicity, aimed at teaching clients the advantages of gas, and the solutions to future problems provoked by it. In this field, exhibits and public demonstrations were very relevant, and they aimed at getting new clients, and preserving the ones that companies already had. We highlight the exhibit that the *Compagnie Parisienne* organised in the *Hôtel du Louvre*, in the winter of 1856. The French press described it, emphasising the positive impact that gas heaters had on the exhibit's attendants, who did not know about that appliance, yet (Mustar, 1984).¹² The press, as well as illustrated brochures, like the one edited by the *Compagnie Parisienne* in 1900, echoed the repercussions of such events. Apart from mentions to comfort, hygiene, and energetic efficiency, companies looked for direct contact with potential clients, in order to transmit a close-to-the-public image of themselves.

Did the marketing campaigns succeed? A (peculiar) perspective from abroad

It is very difficult to state if the marketing strategies that have been presented in the previous section succeeded, or not. We can only count on general statistics about coal consumption, and about gas subscribers, in the three countries. Works on the evolution of these indicators have already been mentioned in the second section of the present paper, in the case of the United Kingdom (Thomas, 2014, pp. 4-6; Fernández Paradas, 2009; Fernández-Paradas and Pinto Tortosa, 2021a), France (Williot, 2005; Martínez-López and Mirás Araujo, 2021), and Spain (Martínez López and Mirás Araujo, 2018; Fernández-Paradas and Rodríguez Martín, 2022). The problem is that, more often than not, they do not always provide full information for the use of energy in all sectors. For the interest of the current research, statistics are usually not detailed, so we lack basic information about the uses of coal and gas. For instance, when we address domestic consumption of gas, they do not specify whether it refers to lighting, heating, cooking, or all of them.

Therefore, the evolution in the number of clients that gas companies got in the period addressed in this text could be due to a combination of factors; among them, but not only, marketing and publicity by gas companies. Together with them, we must consider the evolution of per capita income in the three countries, fluctuations in energy prices, global economic circumstances, etc. Nevertheless, we think it is interesting to study a peculiar contemporary testimony of the situation of the European energy market, which includes a full description of consumer behaviour in Great Britain, France, and Spain. It is important, though, to remember that the testimony corresponds to observers who were alien to the European scenario, and judged the situation from an external perspective, so the reports studied must be seen with caution. We refer to *Cooking and Heating Stoves in Foreign Countries* (1914), a collection of reports by United States consuls in Europe, which talk about the chances to selling North American cooking and heating stoves in the Old Continent.

In Great Britain, the United States consul in London, John L. Griffiths, talked about a crisis in the gas industry. The situation was worrying for gas companies, he said, because the British people bought gas stoves and heaters, as well as electric ones, but they still used coal to warm their houses. Hence, gas consumption was decreasing (*Cooking*, 1914, pp. 36-44). Companies, Griffith went on, were lowering prices, with some positive impact on their clients. For instance, they installed gas heating at homes for a subscription of 36 pens a month, except for the summer (June-September). As far as he knew, the strategy worked in London, but not in Manchester, where most people still used coal fire, and electricity was gaining more and more subscribers. Finally, he added, some counties, like Yorkshire, had municipalised the service. Thus, he concluded that the impact of marketing strategies by British gas companies was limited.

In Northern France, the United States consul in Le Havre, John B. Osborne, said that demand for heaters and stoves was high. British coal could be found easily at low prices, as British ports were at the other side of the Canal, and there was also plenty of French coal (*Cooking*, 1914, p. 10). On the other hand, there was no way that Southern France consumed stoves and heaters, warned Osborne. Coal, either from the United Kingdom or from France, was more expensive, due to transportation costs. Besides, the mild weather made such heating devices unnecessary: when people in that region felt cold, he observed, they warmed themselves with firewood. Even so, another United States consul in France, Erwin W. Thompson, thought that a stronger marketing campaign in the Southern regions of the country, based on more competitive prices for heaters and stoves, would encourage the demand. Thompson found it more difficult to persuade the inhabitants of Paris, whom he described as inclined to save their money, to use salamanders, which were more efficient and consumed less energy. His conclusions were the same as Griffith's in Great Britain: the impact of gas publicity on the French market was limited (*Cooking*, 1914, p. 13).

Energy consumption in Spain, according to the same source, was much lower than in the previous two cases. In this country, the United States consul in Madrid, F.T.F. Dumont, went as far as to say that in 1914, three-quarters of the Spanish people used no stove or heater to warm themselves, nor did they use gas cooks. The well-off families consumed around one-

¹¹ *JoGL*, 10 November 1908.

¹² *Journal d'Éclairage au Gaz [JEG]*, 5 November 1856.

half ton of coal to warm their homes and to cook, but only between November and April, he went on. Heaters and stoves could not raise the temperature over 15°C, as they did not work well. Dumont also regretted that wealthy families were not ready to spend more money on coal, which was very expensive. According to him, the Spanish people were used to fighting the cold in winter by wearing thicker clothes. Not even Madrid was an exception, despite the fact that it had 600,000 inhabitants, five high-class hotels, and three famous restaurants (*Cooking*, 1914, p. 24). Dumont, like Osborne in France, did not surrender, and suggested the start of a campaign to get more consumers, and to teach the people the advantages of gas at home. So, he stated that the reach of the marketing campaigns by gas companies was much more limited in Spain than in Great Britain and France.

As we warned at the beginning of this sub-section, the circumstances described in this document must be addressed from a critical perspective. On the one hand, United States consuls in Great Britain, France, and Spain were privileged observers of the behaviour of their new fellow citizens. Used to live in the country, among its people, they were supposed to be familiar with cultural and consumer trends. On the other hand, as reporters to North American companies interested in selling cooking and heating stoves in the European market, they were acting as commercial agents. Hence, the image they describe in the three countries may be biased, due to two complementary reasons: firstly, they needed to promote the use of (the United States') gas cooking and heating stoves. Though in some cases the description they provide is pessimistic, they are always persuaded that a stronger campaign can get more subscribers. Secondly, as happens with gas companies and their marketing strategies, they want to persuade everyone, even workers, that they can access such cooking and heating devices. But the circumstances of the working class made it impossible.

The context that they described worsened as a consequence of the First World War, during which coal prices rose, provoking a deep crisis in the gas sector. The effects of the Great War crisis, combined with the Great Depression, and the Second World War, would last long. In the United Kingdom, they soon reached the pre-war coal and gas production levels. Domestic consumption of coal gas increased, in a trend that continued until the 1960s, when natural gas substituted it. Democratization of gas heating in French homes did not happen until the end of the Second World War, thanks to the improvement in the people's acquisitive power, and to the discovery of natural gas (Viguié, 2024). Finally, Spanish gas production did not reach the figures of the first years of the 20th century until 1928 (Sudrià, 1983, p. 115). In fact, the use of gas for domestic heating was very limited in the country in the first half of the century.¹³ Gas heating did not spread to Spanish homes until the 1960s and 1970s, thanks to the production of petrol-liquefied gases (GLP) and natural gas. The first ones allowed the Spanish people to use low-cost stoves, fuelled by butane bottles. Natural gas made it possible for blocks of flats and apartments to incorporate central heating, which could also be fueled by gas-oil and petrol (Mera Vázquez *et al.*, 2024, pp. 29-31).

CONCLUSIONS

The gas sector was essential in the European industrial take-off, at the turn of the 19th century. Not only did gas provide potential consumers with a new, more powerful energy source, but it also contributed to deep transformations in European society and economics. For example, leisure activities could take place even after sunset, thanks to gas lighting, in streets, in restaurants and cafes, and at home. Likewise, factory owners could make their workers stay longer on their posts, in order to increase production. Besides, gas was essential for activating other industrial sectors, whose awakening was possible thanks to the needs of the gas industry: new railway lines connected coal mines to main cities, and to ports. And new, more modern infrastructure was required for gasworks to operate, motivating innovation in engineering and building, too.

As the only modern energy source, gas dominated the European market, imposing its monopoly over energy supply to the people. It is true that homes, especially those of workers, still use conventional lighting, heating, and cooking procedures. Among them, firewood and coal were the main fuels that common people used. But public lighting saw the uncontested dominion of gas companies for more than half a century. As time went by, middle-class and high-class homes incorporated gas lighting, together with gas cooking and heating, so gas's monopoly over the energy market strengthened. Such circumstances did not push companies to improve their service, as no one could compete with them. Nor did they consider the possibility of lowering prices, for the same reason: cities and families who wished for a modern way to lighten and to heat their homes, and to cook, could only think of gas. The only alternative possible was to go back to using firewood, coal, etc. Yet, social elites were not ready to do so, as the implementation of "modern" devices at home meant social distinction, whereas more conventional ways to produce energy were associated with the poor.

Trouble started when electricity appeared as a terrible competitor to gas, in the 1870s and 1880s. The new energy source was much cheaper, it could supply areas that gas had never reached. Very soon the authorities realised that, if they trusted electricity, they would not depend on monopolistic abuses by gas companies anymore. Even municipal, regional, and national legislation, as well as judicial sentences, started to favour electricity, ending the gas monopoly. In that context, the only way that the gas sector found to confront its main competitor was to insist on alternative uses of the energy source, which had been developing since the beginning of industrialisation. The innovation now lay in the use of marketing strategies, mainly publicity campaigns, to persuade the public to buy gas cookers and gas heaters, and to install gas lighting at home. In an attempt to reach a broader group of consumers, they even tried to depict gas domestic devices as accessible to the working class.

¹³ In 1947, only 40 gas factories operated in the country (Sudrià, 1983, p. 115).

Publicity linked to gas heating, which we have analysed and described broadly in the third section of the article, evolved and became more sophisticated as time went by. Initially, it consisted only of brief paragraphs describing the advantages of the heating devices, together with small, very schematic illustrations. In the following decades, images became the main element in advertisements, showing domestic ideal atmospheres, where the people represented, mostly women, enjoyed the benefits of gas heaters and stoves. Text was limited to short, direct messages that were aimed at calling for consumers' attention. The revolution that marketing and publicity meant in the European energy market is undeniable, and in the first decades of the 20th century, gas companies would insist on the same tools to get more consumers. Nevertheless, we must be critical of the results of such campaigns.

First, it is very difficult to guess whether the fluctuation in the gas market, if any, was due to the impact of publicity. Statistics often talk about gas domestic consumption as a whole, making it impossible to guess whether gas was consumed in lighting, heating, cooking, or all of them. Second, the analysis of the examples of publicity mentioned in the text leads us to conclude that, though companies tried to address everyone, the working class included, the symbols, language, and cultural elements they used appealed only to the European middle and high classes. Third and foremost, even if gas companies had actually worried about using communication codes, and distribution channels, that were familiar to the working class, it seems that they would not have succeeded, anyway. The reason is that workers' per capita income remained low in the period that we have studied, and that most citizens still used firewood and coal for heating, even up until the 1950s.

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Jose Joaquín Luque García: conceptualization, formal Analysis, resources, writing – original draft, writing – review and editing of “Theoretical and conceptual framework”, “Heating... for everyone? Case study of marketing strategies for coal gas heating in the United Kingdom, France, and Spain – Competition tools within the energy market”, and “Conclusions”.

Antonio Jesús Pinto Tortosa: conceptualization, data curation, methodology, writing – original draft, writing – review and editing of “Introduction”, “Heating... for everyone? Case study of marketing strategies for coal gas heating in the United Kingdom, France, and Spain – Did the economic context favor the success of marketing campaigns?”, and “Conclusions”.

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