

## THE IMPACT OF WORLD WAR II ON GAS PRODUCTION IN LATIN EUROPE<sup>1</sup>

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### Abstract

The gas industry has faced different crises throughout its history, the most severe occurring during the two world wars, and the current one as a result of the War in Ukraine, when large-scale difficulties became widespread. During World War II, the problems that the gas sector faced were the lack and the increased cost of coal, the raw material with which most of the gas was manufactured, but it also had difficulties to obtain materials and equipment to maintain the facilities. Likewise, the mobilization of manpower to the frontlines, particularly skilled workers, who were difficult to replace. And, unquestionably, war operations and total war, which distorted the traffic of goods and people, as well as communications, which affected the capacity to make decisions. It was common for gas companies with head offices in warring countries to have to relocate them. In addition, in the United Kingdom, France and Italy the facilities suffered attacks, and, occasionally, in the latter two countries the assets were on both sides as the war progressed. This chapter deals, for the first time, with the challenges faced by the gas industry in Latin Europe, specifically, in Spain, France, Italy and Portugal, but also in the United Kingdom, the leading European gas industry at that time. These all represent warring and neutral countries. To do this, the text will focus on the analysis of gas production, evaluating the aforementioned obstacles that this sector had to cope with. The text is based on the available literature, statistics, business documentation and the reference journal for the sector in continental Europe, the *Journal des usines à gaz*.

Key words: gas, industry, Latin Europe, World War II.

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<sup>1</sup> This research forms part of the results of the R+D+I Research Project «Gas in Latin Europe: a comparative and global perspective (1818-1945)», PID2020-112844GB-I00, financed by the Ministry of Science and Innovation of the Government of Spain and ERDF Funds. Likewise, it has benefited from the research stay that was carried out in 2015 by Mercedes Fernández-Paradas at the Centre for Contemporary Spanish Studies, European Institute, London School of Economics and Political Science, devoted to «The gas industry in Great Britain and Spain: historiography and sources (circa 1800-1950)».

## I. INTRODUCTION

Gas industry has faced crises throughout its history. The most severe distress occurred during the two world wars, when large-scale and widespread difficulties befell it. Among them, the lack and the increased cost of coal (the raw material with which most of the gas was elaborated) stand out, but also access to materials and equipment to maintain the facilities. Likewise, the mobilization of the workforce to the front, particularly skilled staff, who were difficult to replace. And, certainly, military campaigns and war itself (which distorted the movement of goods and people), as well as communications, which affected their capacity to make decisions. It was common for gas companies with headquarters in warring countries to have the need to move them. In addition, in United Kingdom, France and Italy the facilities were damaged from attacks and, occasionally, in the latter two countries the assets were split on both sides as the war progressed.

This chapter addresses, for the first time, the challenges that gas industry in Latin Europe had to meet, specifically in France, Italy, Portugal and Spain, as well as in United Kingdom, which at that time hosted the most powerful European gas industry. Therefore, these are representative of belligerent and neutral countries. To do this, we analyze the evolution of gas production. The text is based on the current literature, statistics, business documentation and the leading journal for the sector in continental Europe, the *Journal des usines à gaz*.

## II. GAS PRODUCTION

Table 1 shows the evolution of piped gas production, most of it through distillation in coal furnaces, in the Latin European countries that are considered in the paper, and in United Kingdom. The data does not include the gas that was generated in the coke ovens.<sup>2</sup> Gas production was affected by the lack, higher prices and worse quality of coal, by war campaigns which damaged the gas infrastructure, by the mobilization of the workforce and the staff and by complications in the management of the companies as a result of the state of war. It is worth noting the disproportion in supply levels among countries.

At the top, by far, was United Kingdom, with more than 9,043 million cubic meters in 1938, followed far away by France, Italy and Spain. From Portugal we only have figures for the entire series for Lisbon, the most outstanding gas consuming centre in that country. Table 1 and the remaining tables for which we have data, cover from 1935 to 1947, that is, from the year before the start of the Spanish Civil War up until two years after the end of World War II. Between 1935 and 1947, gas production increased by 3.1% in Spain, 180.3% in Portugal, and 24% in United Kingdom. For Italy, this calculation is not appealing, as the available data is more inconsistent.

In Spain,<sup>3</sup> compared to 1935, gas generation in 1938 and 1939 was 24.8% and 11% lower, respectively. In 1940 it exceeded pre-war levels by 8.9%. Since then, it fell, chiefly in 1941, being 16.5% less than in 1938, due to the fact that the national

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<sup>2</sup> In the interwar period, the gas that was generated in coke ovens as a by-product of coke manufacturing began to develop more intensely.

<sup>3</sup> The Spanish Civil War began on July 18, 1936 and ended on April 1, 1939.

government did not include the gas sector among the preferential activities for the distribution of coal consumption. The following years were of ups and downs, since 1944 it was above the level of 1935, and in 1946 it was 6.2% higher.

Years/Countries	Spain	France* <sup>1</sup>	Italy* <sup>2</sup>	Portugal* <sup>3</sup>	United Kingdom
1935	189,047	1,754,211	543,000	11,646	7,372,301
1938	142,183	1,722,867	675,924	12,961	9,043,265
1939	168,196	1,532,753	691,433	13,613	9,029,455
1940	205,926	1,405,779	737,677	14,471	8,675,563
1941	118,742	1,821,052	880,610	15,647	9,324,170
1942	157,226	1,957,260	850,000	17,598	9,708,655
1943	179,589	1,999,127	601,213	20,924	9,851,343
1944	198,199	1,483,109	524,700	25,000	10,337,990
1945	189,322	1,965,726	294,164	27,521	10,651,837
1946	200,751	2,466,658	581,526	29,242	11,853,595
1947	194,860	2,508,800	854,510	32,645	9,137,227

**Table 1.** Gas production in Spain, France, Italy, Portugal and United Kingdom, in thousands of m<sup>3</sup> (1935-1947). Source: Companhias Reunidas Gás e Electricidade (1936, 1939-1948); Sindicato Vertical de Agua, Gas y Electricidad (1948); Union Internationale de l'Industrie du Gaz (1949); Compendio dei dati statistici relative alle officine del gas d'Italia (dall 1938 al 1949). Author's elaboration.

\*<sup>1</sup>. For 1935-1940 these are estimates from sales data, using the three-year average of the difference, in percentage, between production and sales for 1941-1943.

\*<sup>2</sup>. 1935: data from 1936. 1943-1947: estimates from sales data.

\*<sup>3</sup>. It only refers to Lisbon.

The reality of the Spanish gas industry was complicated, due to the rising cost and scarcity of coal, and the government's obstacles to its purchase inside and outside the country; but also the equipment shortages, by not considering the gas sector among the priority activities. Until then, the main foreign coal supplier had been United Kingdom. This changed, as a consequence of an early blockade to Spain as a reaction to the winning side in the civil war and due to the distortion of trade that was caused by World War II. But also because the government prioritized the transport of goods within the country by rail to the detriment of the gas industry, in addition to the restrictions that the government established to the coals imports.

Year/Countries	Spain	France	Italy* <sup>1</sup>	United Kingdom
1935	423,637	3,698,677	1,015,539	
1938	313,338	3,731,217	1,370,362	19,434,050
1939	362,219		1,381,408	19,610,835
1940	404,752		1,370,614	18,270,730
1941	223,335		1,418,833	19,628,105
1942	251,494		1,254,004	20,964,145
1943	283,489			20,071,840
1944	284,289			20,960,080
1945	261,390			21,188,680
1946	280,618			22,899,625

**Table 1.** Coal consumption by the gas industry in Spain, France, Italy and United Kingdom, in tons (1935-1946). Source: Sindicato Vertical de Agua, Gas y Electricidad (1948); Union Internationale de l'Industrie du Gaz (1949). Author's elaboration.

\*<sup>1</sup>. 1935: This data refers to 1936.

This forced to resort to Asturian coal (which was less suitable for producing gas) and to generate gas from water and other fuels, such as wood, etc., so its calorific value dramatically fell. In 1939, coal consumption was 14.5% and 15.6% lower than in 1935 (423,637 tons) and 1938 (313,338 tons) respectively. In 1940 it was 4.5% higher than before the war. The data worsened considerably in the following years until 1946, in none of which did they exceed 284,000 tons (Table 2). The result was twofold. On the one hand, the partial or temporary closure of gas factories. On the other, the calorific value of gas dropped from 4,000-4,500 calories before the Civil War to 3,500 during the war and the postwar period (Barca and Alayo, 2011, p. 77; Fernández-Paradas, 2019a, pp. 261-267; Fernández-Paradas, 2019b, p. 29).

Table 3 talks about gas production per ton of coal that Spanish, French, Italian, and British factories consumed in the years about which we have data. Information will allow us to explore the quality and efficiency of the aforementioned fuel in gas generation. In the years prior to World War II, figures are quite similar in the four countries, which indicates the use of coals of similar quality, too, as well as the standardization of productive processes in western Europe. Surprisingly, during the conflict gas production per tone of coal will increase progressively. The reason, according to the data analyzed, was the use of other raw materials for generating gas, given the scarcity of coal, mainly in countries that did not produce it, like for example the Mediterranean nations. In fact, the much higher increase in gas production in Spain and Italy points in that direction.

Year/Countries	Spain	France	Italy	United Kingdom
1935	0,45	0,47	0,53	
1938	0,45	0,46	0,49	0,47
1939	0,46		0,50	0,46
1940	0,51		0,54	0,47
1941	0,53		0,62	0,48
1942	0,63		0,68	0,46
1943	0,63			0,49
1944	0,70			0,49
1945	0,72			0,50
1946	0,72			0,52

**Table 2.** Production of gas by tone of coal in Spain, France, Italy and United Kingdom in thousands of m<sup>3</sup> (1935-1946). Source: Tables 2-3. Author's elaboration.

The lower quality and quantity of coal resulted in a significant reduction in the coke generation,<sup>4</sup> which was the main by-product manufactured during the distillation of coal to fabricate gas. Throughout the whole series, it never recovered the pre-Civil War level and from 1941 (which was the worst year) it added up to only two thirds (4).

Year/Countries	Spain	Italy	United Kingdom
1935	274,566		
1938	192,352	624,598	12,841,210
1939	227,986	819,054	12,552,680
1940	259,932	812,615	12,081,260
1941	130,344	835,920	12,967,240
1942	147,723	946,277	13,941,555

<sup>4</sup> Coke and other by-products that were manufactured in gas factories were essential to the arms industry, becoming strategic products during World War II. *Journal des usines à gaz*, January 5, 1940.

1943	170,015	805,008	14,267,690
1944	171,859		14,180,315
1945	143,968		11,771,380
1946	173,723		12,558,780

**Table 3.** Coke production of the gas industry in Spain, Italy and United Kingdom, in tons (1935-1946). Source: Union Internationale de l'Industrie du Gaz (1949). Author's elaboration.

Year/Countries	Spain	Italy	United Kingdom
1935	0.65		
1938	0.61	0.46	0.66
1939	0.63	0.59	0.64
1940	0.64	0.59	0.66
1941	0.58	0.59	0.66
1942	0.59	0.75	0.67
1943	0.60		0.71
1944	0.60		0.68
1945	0.55		0.56
1946	0.62		0.55

**Table 4.** Coke production by tone of coal that was consumed by the gas industry in Spain, Italy and United Kingdom, in tons (1935-1946). Source: Tables 2 y 4. Author's elaboration.

Data included in Table 5, which tells about the efficiency in getting coke, suggests that the British gas industry was more efficient and/or used coal of higher quality than the rest of Mediterranean Europe, especially Italy, though before the war there were almost no differences with Spain. If we consider the Italian figures as right, World War II might have affected Spain significantly, as it diffculted the country's access to British coal.

In France, the law of January 15, 1941 of the Vichy government,<sup>5</sup> established the administrative regime for the gas industry. The gas was taken under the control of the Ministry of Industrial Production, which included the production, transportation and distribution of fuel gases of all kinds. By the decree of April 21, 1941, the Organizing Committee of the Gas Industry was created (Williot, 2006, p. 50). For France we have data on gas production between 1941 and 1946. Between 1941 and 1945 it remained on average around 1,900,000,000 m<sup>3</sup>, with the exception of 1944, a year in which it fell back to 1,483,109,000 m<sup>3</sup>, probably (at least partly) as a consequence of the war operations after the Normandy landings.

This path is in line with the drop in the manufacture of tar in 1944, a by-product of the distillation of coal in the gas production process, which fell by more than half in 1944 compared to 1939. It grew again in 1945-1946, although in the latter year it still had not recovered the level of 1938 (Table 6).

Year/Countries	Spain	France	Italy	United Kingdom
1938	12,789	193,415	43,840* <sup>1</sup>	1,076,525
1939	14,732	189,879		1,068,007

<sup>5</sup> In June 1940, Germany and France signed the armistice that sanctioned the defeat of the French. The Vichy government, led by Philippe Pétain, became the continuation of the French Third Republic. Germany seized the west coast and north of France, also the interior of those regions. Italy occupied a small border area in the south. The Vichy regime kept the rest of the unoccupied territory, although it was *de facto* controlled by Germany. In June 1944 the situation changed after the Normandy landings, which ended the occupation at the end of that year.

1940	18,332	156,940	43.885	1,013,115
1941	8,577	152,891	46.593	1,063,068
1942	8,777	156,872	42.844	1,134,328
1943	10,495	157,274		1,136,044
1944	10,105	93,316		1,120,195
1945	9,314	123,528		1,175,842
1946	9,711	184,393		1,304,710

**Table 5.** Tar production of the gas industry in Spain, France, Italy and United Kingdom, in tons (1938-1946). Source: Union Internationale de l'Industrie du Gaz (1949). Author's elaboration.

\*1. This data refers to 1937.

In September 1941, the French gas factories received 85.9% of the coal they needed. The cost of coal in the mines became more expensive, and also maritime transport costs.<sup>6</sup> In 1938, France extracted 47.5 million tons.<sup>7</sup> After the beginning of the war, the production was affected by the division of the country and the overlapping of several authorities (in the occupied land and the territory controlled by the Vichy government): military, civilian, German, and French. The Moselle mines, which were located in the northwest of the country, were closed. The Nord-Pas-de-Calais mining region was assigned to the German administration in Brussels, whose decisions sometimes disagreed with the German military authority in Paris. The coal-rich regions of Alsace and Lorraine became part of Germany. In addition, the traffic of this fuel was disrupted by the existence of different authorities. The French production was insufficient. The mines of Nord-Pas-de-Calais had stopped extracting it as a result of the German invasion. The output reached a peak in April 1940 of 4,400,000 tons. Subsequently, activity in the Nord-Pas-de-Calais basin restarted in June. In October, the coal extracted had not recovered the level of six months earlier, and the monthly average of all the basins was 3.6 million tons. In 1942 production reached 42.8 million tons, 47.5 million in 1943 -similar to the pre-war levels- while consumption was 68 million tons, which forced to import almost 23 million tons from United Kingdom, Germany, Netherlands, Belgium and Poland. The Vichy government was not free to decide on the distribution of coal. In that territory, the purchase of this raw material was commissioned by Groupement charbonnier gazier, which was dependent on the Direction des Mines (Chélini, 2009, p. 118).

In 1944, France produced 26.5 million tons of coal, an amount that steadily declined since the beginning of that year, collapsing in most basins due to mining strikes. At the end of that year the monthly national production was less than 2 million tons. Nord-Pas-de-Calais was by then liberated. The Petite-Rosselle mining area, located in the Moselle department, did not recover production until March 1945. In addition, the Germans sabotaged mines, which contributed to the drop in output during the spring. Both in Vichy territory and in the zone occupied by Germany, a Committee was in charge of the distribution of coal. This way of proceeding did not change after the liberation of the country because there was still a deficit of that product. The needs of the war took priority until Germany capitulated in May 1945. Then France became the territorial base of the allies. The lack of coal was widespread at the end of 1944 as well as in 1945, affecting countries like Great Britain, Belgium,<sup>8</sup> and Poland, which had traditionally

<sup>6</sup> *Journal des usines à gaz*, April 5, 1940.

<sup>7</sup> *Journal des usines à gaz*, February 20, 1940.

<sup>8</sup> In Belgium, in 1944, the volume of the extracted coal was 45% of the coal obtained in 1938 (Varon, 1947, p. 68).

supplied the French, whereas the United States did extract more than before the war. In 1945, France extracted 32 million tons. After the end of the war, United Kingdom drastically reduced shipments to France, and the consignments from Belgium and Poland were interrupted (Varon, 1947, p. 68; Trempé, 1989, pp. 15-28).

The source consulted for Italy,<sup>9</sup> the *Annuario di Statistiche Industriali*, raises doubts about the representativeness of the gas generation figures, as it acknowledges that the data for 1939-1941 only include gas factories, and also suggests that for the years 1943-1946 the data are merely approximate. For this reason, for 1935 these are estimates from sales data, using the three-year average of the difference, in percentage, between 1938-1940 production and sales. The same procedure has been applied for 1947 with respect to 1941-1943.

Italian coal production was, according to various sources, between 882,259 and 949,053 tons in 1938, figures that remained at or even exceeded 1 million tons until 1942. Unfortunately, we do not have data for the following years. However, this growth was not enough to offset the smaller imports from abroad. Italy consumed 9.8 million tons in 1938, 9.5 million in 1939, 11.7 million in 1940, 10.2 million in 1941, 9.7 million in 1942, and since then consumption fell drastically, reaching the minimum in 1945, with 2.5 million tons.<sup>10</sup>

We do not have data on gas generation in Portugal,<sup>11</sup> but we do have for Lisbon, the main consumer centre in the country, which was supplied by the company *Companhias Reunidas Gás e Electricidade*. The gas that was produced grew steadily since 1938, and in 1945 it was 112.3% higher.<sup>12</sup> Lisbon was a unique case in the Portuguese context since the gas market for households maintained a strong presence, unlike what happened in other Portuguese cities.<sup>13</sup> With this exception, of all the countries considered, it was the one that apparently had the most positive behaviour. Nevertheless, it also underwent difficulties in coal supplies and transportation. From the second half of 1941 the firm had to use alternative fuels such as firewood and olive pomace. This negatively affected the quality of the gas, since these raw materials, also national coal, had a lower volatile proportion than foreign ones. It also suffered from the rising price of all raw materials.<sup>14</sup>

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<sup>9</sup> In Italy's participation in World War II, two periods can be distinguished. The first, from June 1940, which was governed by Benito Mussolini, being on the side of Germany. The second, after the fall of the dictator in the summer of 1943, King Victor Emmanuel III and his new government signed an armistice with the allies. However, Germany took the control of most of the territory, creating a republic with Mussolini commanding. Since then, a civil war was triggered in the country between supporters of both sides.

<sup>10</sup> Online. URL: [https://www.wiki.it-it.nina.az/Azienda\\_Carboni\\_Italiani.html](https://www.wiki.it-it.nina.az/Azienda_Carboni_Italiani.html) (Malanima, 2006, p. 21; last access on 11-04-2023).

<sup>11</sup> Portugal stated to be neutral in World War II, but since August 1943 it became non-belligerent in favour of the allies.

<sup>12</sup> A new gas factory started operating in 1944 (Cardoso de Matos, 2018, pp. 21-22).

<sup>13</sup> The Lisbon gas concession company managed to build a gas factory between 1939 and 1942 or 1943. However, it did not start operating until 1944 due to a lack of pipelines supply (Cardoso de Matos, 2018, pp. 21-22).

<sup>14</sup> The British coal that arrived at the Lisbon company in 1940 was 10% more expensive than it was in August 1939; the US one, 200%. The British increased 55% between February and December 1942, 40% between January and December 1943, and the US 11%. Of the national coals, in this last period anthracite increased 27% and firewood 30% (*Companhias Reunidas Gás e Electricidade*, 1941-1944).

Gas production in the United Kingdom, the country that led the war against Germany, was slightly lower in 1939-1940 than it was before the war. In the years thereafter it exceeded it and grew uninterruptedly until 1946, a year in which it was 31.1% higher than in 1938. This was possible thanks to the fact that the gas industry maintained similar levels of coal consumption, around 19.4 and 22.9 million tons (Table 2). Conversely, gas production in the country fell, in 1938 it was 226 million tons, in 1939 it increased slightly, but from then on it decreased nonstop until it reached 20.3% less in 1945 than before the war (Varon, 1947, p. 680). This means that the gas sector managed to hold its supply of coal in an unfavourable context. It did so despite its increased cost, and the difficulties of rail transport, since the functioning of maritime transport was surprisingly efficient. Besides, the coal was not usually of good quality. From 1942, these problems were mitigated when The Board of Trade appointed the Public Utilities Coal Committee, which worked effectively so that each gas company had enough coal (Williams, 1981, p. 84).

### **III. THE CONSEQUENCES OF THE MOBILIZATION OF THE STAFF AND THE DAMAGES OF GAS INFRASTRUCTURES**

The performance of the gas industry was also seriously distorted as a result of the war development and, linked to this, by the mobilization of its staff to the front. In this regard, we have information from two major French gas companies. Lebon et Cie, founded in 1847 by Charles Lebon, with branches in France, Algeria and Egypt. And the Société d'éclairage, chauffage et force motrice, which was constituted in 1903 to supply gas to the Paris suburbs.

The day after the war broke out, Lebon et Cie, following the instructions of the French government, moved its headquarters, including non-mobilized workers, from the capital to Saint-Malo, a port city in Brittany, in the northwest of the country. In the new headquarters, out of 22 people, only 1 remained. On June 23, 1940, the day after the signing of the armistice between Germany and France, 344 'agents' of the company were taken prisoners. At the beginning of 1942, 90 of them were released, due to several family and health circumstance and for they were necessary (because of their capacity as technicians) for the operation of the factories. It should be noted here that the mobilization affected five directors in France, three in Algeria, and in Egypt the director and deputy director of Alexandria factory and the deputy director of Cairo factory. In 1943, company managers were recruited to fight against the German army, in Italy, France, Germany and Tunisia. During the conflict, 17 employees died (Lebon et Cie, 1947, pp. 37, 79, 182).

Workers from various professional categories of the Société d'éclairage, chauffage et force motrice, including the division deputy director of the factories, were involved in combat, especially in the municipality of Gennevilliers (near Paris) in August 1944, where the main Parisian gas factory was located. Alexandre Jouanest stood out particularly for his participation as a sub-sergeant of shooters, in Belgium, Great Britain and France. Later, he was in the Resistance from May 1941, and was deported to the Mauthausen camp from which he survived. He received the Legion d'Honneur, grade Chevalier, from the French government.<sup>15</sup>

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<sup>15</sup> *Journal des usines à gaz*, May 15, 1946, and March 15, 1947.



On the other hand, the damages caused to the facilities were severe. In this regard, we have a document from 1939, entitled *Instruction provisoire sur la défense passive des usines à gaz*, from the Ministère de Defense National et de la Guerre de France, which informs about the measures to be taken to preserve the gas factories. The decree-law of November 12, 1938 obliged the gas companies to ensure protection measures against air raids. They were obliged to designate and instruct the staff, prepare how to ensure and with what characteristics (including warning lights) the lighting during an armed conflict, the camouflage of the equipment, as well as protect the employees and guarantee the smooth running of the factories, also how to respond in case of fire and breakdown in pipes and gas holders. Likewise, the decree defined the tasks to be carried out in the gas distribution networks. To do this, they were under the authority of the Préfets and the Généraux of each region. The gas companies had to draw up a 'Plan de Défense passive' for each factory which should detail the planned measures and the personnel responsible for implementing them.

Some examples might be explanatory of the destruction. In Paris and Île-de-France, at least 18 factories were damaged, among them, the ones of Landy, Villette, Clichy, Cornillan, Gennevilliers, etc.<sup>16</sup> As for the damages suffered by Lebon et Cie, these were valued at 100 million francs. The damages due to the German invasion of 1940 were not considerable, but those caused in 1944 were. For instance, the gas factory and supply networks in the municipality of Fécamp, located in Haute-Normandie, in north-western France, were damaged by Allied air raids from 1941 to 1943. On the night of June 6-7, 1942, the Saint-Lô gasworks, also in the Normandy region, was bombed by the Americans, with a gas holder, furnace rooms and warehouses badly affected. During the night of June 6-7, 1942, the Saint-Lô gasworks, also in the Normandy region, was bombed by the Americans, with a gasholder, furnace rooms and warehouses being heavily affected (Lebon et Cie, 1947, pp. 80, 172). In Italy, due to its magnitude, the allied bombing of the gas factory of Naples with 63 bombs stood out.<sup>17</sup> In the UK, the Gas Light and Coke Company alone had to deal with 20,500 incidents involving gas pipelines. Although, in most cases, gas production could be restarted promptly, the repair of the gasholders required time. One of them, located in Liverpool, which was bombed in 1940, could not work until September 1944 (Williams, 1981, pp. 83-84).

#### IV. CONCLUSION

Gas industry in Latin Europe presented in the 1930s a sharp difference in the levels of implementation and development among France (and the United Kingdom) and the rest of the countries in this area, above all Portugal. On this basis, the war had also a differential impact, depending on its aftereffects on the physical and human capital of this industry, access to coal, and national regulations on this activity (coal quotas, tariffs, rationing, etc.).

In principle, it would be possible to distinguish between the situation of the countries at war (France, Italy, United Kingdom) and the neutral nations (Spain and Portugal). The former reasonably would have faced greater difficulties, although the neutrals too, as

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<sup>16</sup> Archives Nationales (1977).

<sup>17</sup> *Journal des usines à gaz*, May 15, 1946. In the United Kingdom, only Gas Light and Coke Co. faced 20,500 incidents related to gas pipes. In most cases gas production could restart soon, but repairing the gasometers took time. For instance, one of such facilities was bombed in Liverpool in 1940, and could not start operating until 1944 (Williams, 1981, pp. 83-84).

they depended on the external supply of coal, which was now more difficult to get. The situation in reality was complex and nuanced.

In general terms, the results in production were less negative than expected, although the reliability or scope of the statistics, especially for some countries such as Italy or Portugal, is limited. In fact, in all of them, except for Italy, the data for 1945 exceeded those for 1939. However, it is true that throughout this period there were relatively important decreases in the most critical moments of the war for each country: 1940 and 1944 in France, 1944-1945 in Italy or 1940 in the United Kingdom.

Government intervention and regulation of a sector that was then considered strategic meant a break with the previous liberal or municipalist tradition, and laid the foundations for the nationalization of gas industry that took place immediately after the war in some of these countries.

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