

light and power



chapter 1

origins of the gas industry

city gas

Light and energy have played a fundamental role in the history of mankind, to a large extent determining the progress of civilisation. First, man learnt how to use fire started by lightning and lighted bonfires to illuminate the immediate surroundings. Soon man realised that a bonfire as a source of light was inconvenient for performing precision works or for moving.

With time people learnt how to carry light using a torch. An improved form of a torch had one end lined with flax or cotton fibres saturated with wood tar, wax, oil or other flammable substance. A torch was carried in the hand or in special holders made of bronze, copper or iron. Such primitive forms of lighting were still in use in the 19th century. At the same time man learnt how to use one of the oldest known fuels, that is, animal fat, and vegetable fats, including olive oil, for lighting. Thus, oil lamps were invented. In 1773 a Frenchman named Leger devised a wick made of plaited cotton. Over several centuries candles were used in parallel as an alternative to oil lamps.

Great economic and social transformations in the 18th/19th century resulting from the industrial revolution increased the demand for stronger lighting that was also easier to use. Such light was needed for illuminating factories, railway stations and city streets. At the end of the 18th century attempts were made at using gas produced by dry distillation of hard coal for lighting. This invention quickly gained recognition and was put into common use for lighting purposes. ■





Origins of the world's gas industry

The first step towards popularizing the use of gas was John Clayton's chemical experiments in 1684 connected with the carbonization of coal and production of combustible gas. He managed to collect gas in a specially prepared container – an animal bladder.

Photo: A gasholder in Berlin at Prinzenstraße – 1900

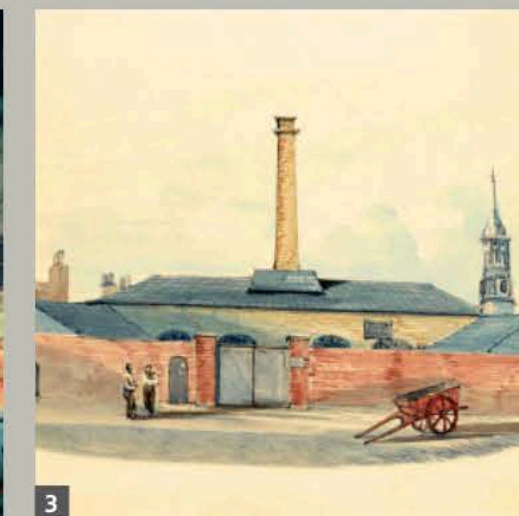
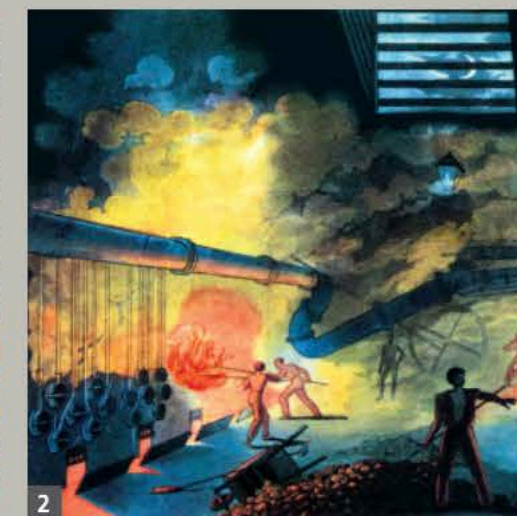
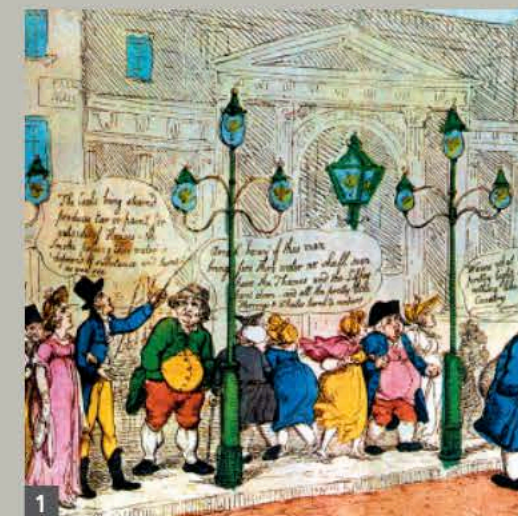


Photo 1: Onlookers at the gas lamps at Pall Mall – Londoners react to the new lighting system – 1809

Photo 2: Emptying retorts in the Great Gas Works at Brick Lane in London – 1821

Photo 3: The old London gasworks at East Norway Street – 1841

However, the real revolution in the production and practical use of manufactured gas took place at the end of the 18th century. In 1776 a French chemist, Philippe Lebon, successfully experimented with the use of gas for lighting and built a so-called Thermolamp. But his invention was underestimated and his efforts at setting up a "society" to support the production of thermolamps, which was a combination of lamp and a heater, fell through.

Considerable changes in the applications of manufactured gas are owed to William Murdoch, who was the first to use coal gas for lighting. In 1792 he aroused common interest and caused a sensation using a unique portable gas lantern during his evening horse ride in the streets of Birmingham. The strange lamp held by the noble citizen was made from a pig's bladder filled with gas terminated with a copper tube with a bright gas flame flickering at the outlet. After numerous experiments Murdoch in the same year built a small gas plant to light his house in Redruth. A brightly lit residence was an excellent showcase and an advertisement for his

invention. In 1795 the first gas factory was built and coal gas, then called illuminating gas, produced on an industrial scale, was used for lighting households and the factories of Boulton and Watt in Birmingham, and later other industrial plants in England.

Thus, Philippe Lebon and William Murdoch, working independently, set the foundations for the gas industry. A long-lasting age of manufactured gas commenced. Gas was produced in classic gasworks by hard coal coking at a temperature 900-1300°C, with no air involved. The manufactured gas was only used for lighting: factory floors, city streets and rooms, thus it was given the historically justified name of "illuminating gas". Later, depending on the period of use, it was referred to as coal gas or eventually – city gas.

In 1812 the Gas Light and Coke Company was officially authorised to run commercial activities in the United Kingdom. It was a joint stock gas company which built the first industrial gasworks in history. It was the actual origins of the gas industry. Within

the next twenty five years it spread throughout Europe and the United States of America where its development was particularly boosted.

Samuel Clegg, an English designer and an associate of Murdoch, made a significant contribution to the new fast developing branch of industry with the introduction of new inventions and technical and process solutions. He designed retorts and gasholders. He was also the originator of the new method for removing hydrogen sulphide from gas using iron compounds.

The gas industry progressed very quickly. Old, uncomfortable and unprofitable street lighting methods were replaced with oil lamp posts.

Normally lamps were extinguished after midnight and when the weather was freezing the oil would often freeze and the lamps went off. Thus, groups of gas lamps were used for illuminating the streets of large European cities. The first city where gas lamps were incorporated into the street setting was London in 1810.

A need arose to use gas lighting not only in city streets but also in public utility buildings such as railway stations, theatres and official buildings. Soon illuminating gas was used to light the first stage – at the opera house in London.

In a short time gaslight conquered the European continent. In 1815-1824 gas lamps appeared in Paris (1818), Vienna and Hannover (1824). In 1825-1830 classic gasworks were built in the main cities of the central and eastern part of the then Germany: in Berlin (1826), Essen and Dresden (1828). In the 1930s subsequent gasworks were built in St. Petersburg (1835) and Moscow and in the cities of the Kingdom of Prussia where gas, apart from street lighting, was used to illuminate buildings in order to raise their prestige.

The most important company in Europe at that time dealing with the building of gasworks and gas systems, including street lighting, was the Imperial Continental Gas Association in England. At the same time competitive gas companies appeared in Germany. One of them was the dynamically developing Blochmann's plant in Dresden which supplied gas to Prussian cities. This was the company which introduced gas in Szczecin

in 1849. The task of constructing the first gas factory in the territory under Russian rule was assigned to the German Continental Gas Society of Dessau which, licensed by the municipal authorities of Warsaw, in 1856 built the Warsaw Gasworks and erected gas lamps in the streets of Warsaw.

After 1850 the gas industry was thriving. Technologies aiming at increasing productivity through more appropriate varieties of coal continued to evolve dynamically. However, the most important element of a gas factory was a gas retort in which hard coal was subject to dry distillation. The history of the gas industry saw several dozen types of gas furnaces differing in the number of chambers – retorts, their arrangement and method of heating and carbonization of hard coal.

Many innovations were introduced to support the operation of equipment and for producing and storing gas under constant pressure. Gas was manufactured in a low-pressure process and was transmitted to consumers by means of the driving pressure of the gasworks' internal gasholder. The gasholder stored the manufactured gas and maintained constant service pressure in the gas system.

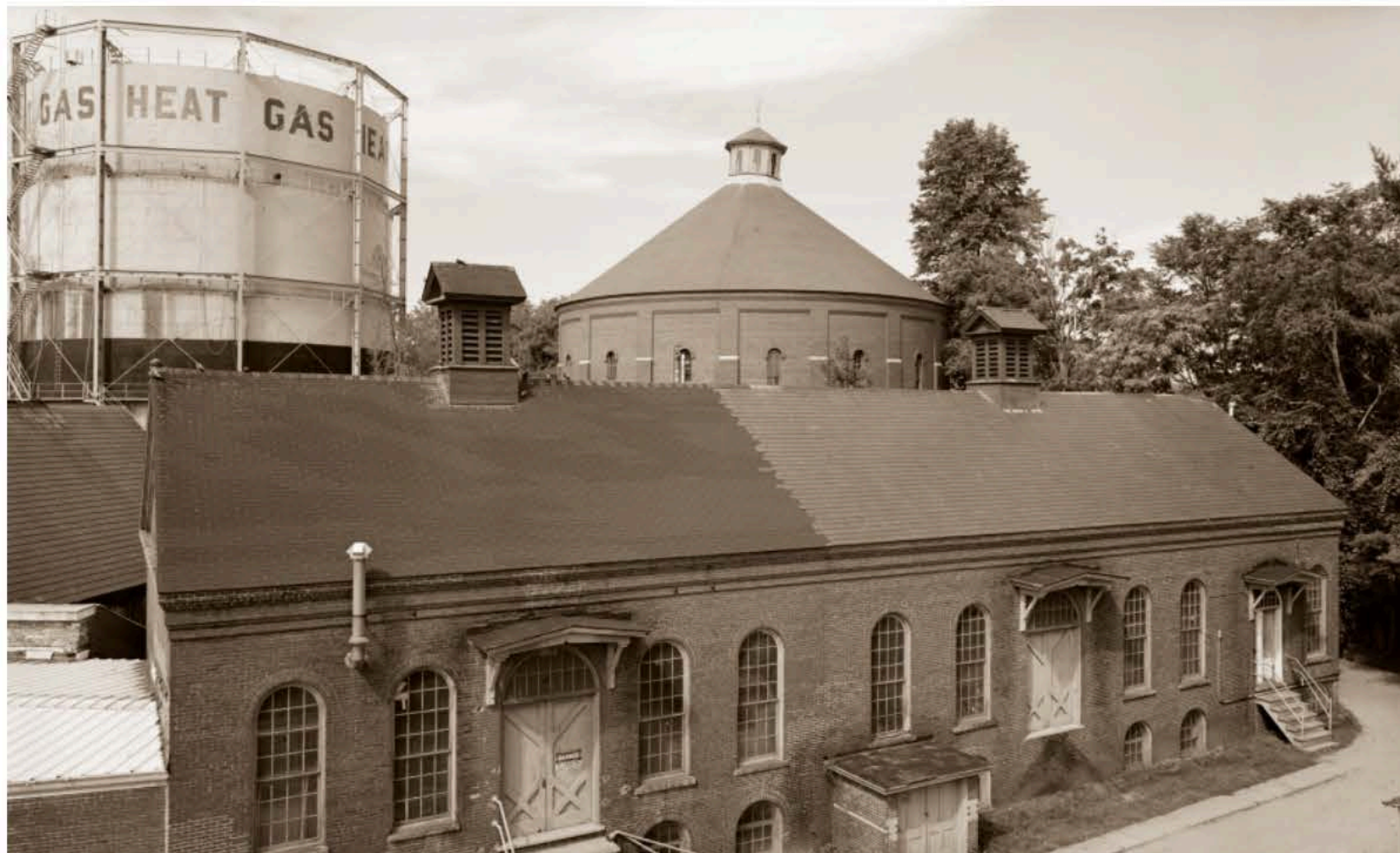


Photo: Concord gasworks in New Hampshire, USA, with gasholders from 1888 (on the right) and 1922 (on the left)



Photo 1:
A French advertisement of Auer's burners – early 20th century



Photo 2:
An advertisement of gaslight – early 20th century



Photo 3:
An advertisement of a gas fireplace by Askania – early 20th century



Photo 4:
An advertisement of a gas fireplace by Vaillant – 1908/09 season

In 1855 Robert Bunsen, a professor of the Heidelberg University, invented a gas burner. The use of a gas and air mixture prior to lighting increased the brightness and temperature of the flame. A gas flame became a versatile light and heat source.

Next, subsequent inventions were made in lighting technology: a gas lamp burner was modified. The metal tube was replaced with a specially adapted Argand burner with a so-called Welsbach mantle designed in 1885 by an Austrian chemist, Baron Carl Auer von Welsbach. The mantle was a cotton net bag soaked in non-flammable compounds of thorium and cerium. It was mounted on the outlet of a ceramic burner with illuminating gas premixed with air burning inside. The incandescent mantle emitted warm white light.

At the same time in England Petit and Smith started using gas not only for lighting but also for heating. They adapted the Bunsen burner for household heating and launched the production of the first gas heaters. The use of gas was popularised not only for household appliances such as various gas stoves – it was also used in gas fireplaces, water heaters and many new models of household appliances burning gas and recovering heat such as refrigerators, coolers, and irons. It was also used for specialist service equipment such as: hair curlers, hot presses, coffee burners and various heaters and



Photo: Auer Burner – the so-called “Welsbach mantle” – commonly used in street gas lamps

boiling pots. Design solutions related to gas appliances passed from one country to another. Thus, different models were often identified by identical names although their construction differed from the prototype.

New forms of gas receivers required good quality gas so new gas cleaning methods and techniques were introduced. The initial primitive flushing with water was substituted by a series of physical and chemical processes aimed at removing all undesirable impurities and extracting gas components affecting the process of combustion. Simultaneously with technical progress the production capacity of local gasworks increased along with the range of the gas system and the number of gas consumers.

At that time gas pipelines were built from flanged cast iron pipes with diameters decreasing at farther distances from the gasworks. To secure better gas delivery separate distribution branches were joined by crosswise connectors.

Although the gas industry based on “individual gasworks” was seriously developing, it could not be deemed a widely interpreted gasification and was only of local significance. The grounds were laid only by high-pressure pipelines transmitting significant amounts of gas from gasworks and coking plants at long distances. ■



Photo: Carl Auer von Welsbach (1858-1929)

Technology

The main gas manufacturing equipment in classic gasworks comprised gas retorts and producers. The most important process – carbonization, that is, dry distillation of coal (airless coking) – took place in the retorts. Gas, via the tubes from the top part of the retort setting, would enter a hydraulic main where it was pre-cooled. Also, about 80% of gas pitch was removed there, thus isolating gas and preventing it from being mixed with air in case the retort opened.

Gas was subject to further processing in the machine room:

- cooling – gas coolers were mounted next to retorts. Here, the gas temperature dropped to about 30°C; then, exhaust fans pushed the gas further from the retort house to other processing machinery;
- tar separation – in Pelouze's mechanical tar separators and then in electrostatic devices the content of coal-tar in gas was reduced from about 0.2 g/m³ to 0.05 g/m³;

- ammonia removal – in ammonia rinsers (standard revolving or scrubbers) ammonia was rinsed out of gas by water spraying;
- naphthalene and benzene extraction – all impurities were washed out with oil in scrubber type machines;
- desulphurization – hydrogen sulphide and organic compounds of sulphur were removed in sulphur-removal box devices in which gas was filtered through the absorbent containing iron ores that reacted with sulphur.

Purified gas was pumped into gasholders from which it was distributed to the gas network. The most common gasholders were those with water tanks. The tank, shaped like an upside-down bell, was immersed in water. When filled with gas (lighter than water), the tank would move upwards. When it was being emptied – it moved downwards. This allowed maintaining constant pressure in the gas system even if different amounts of gas were received throughout the day.

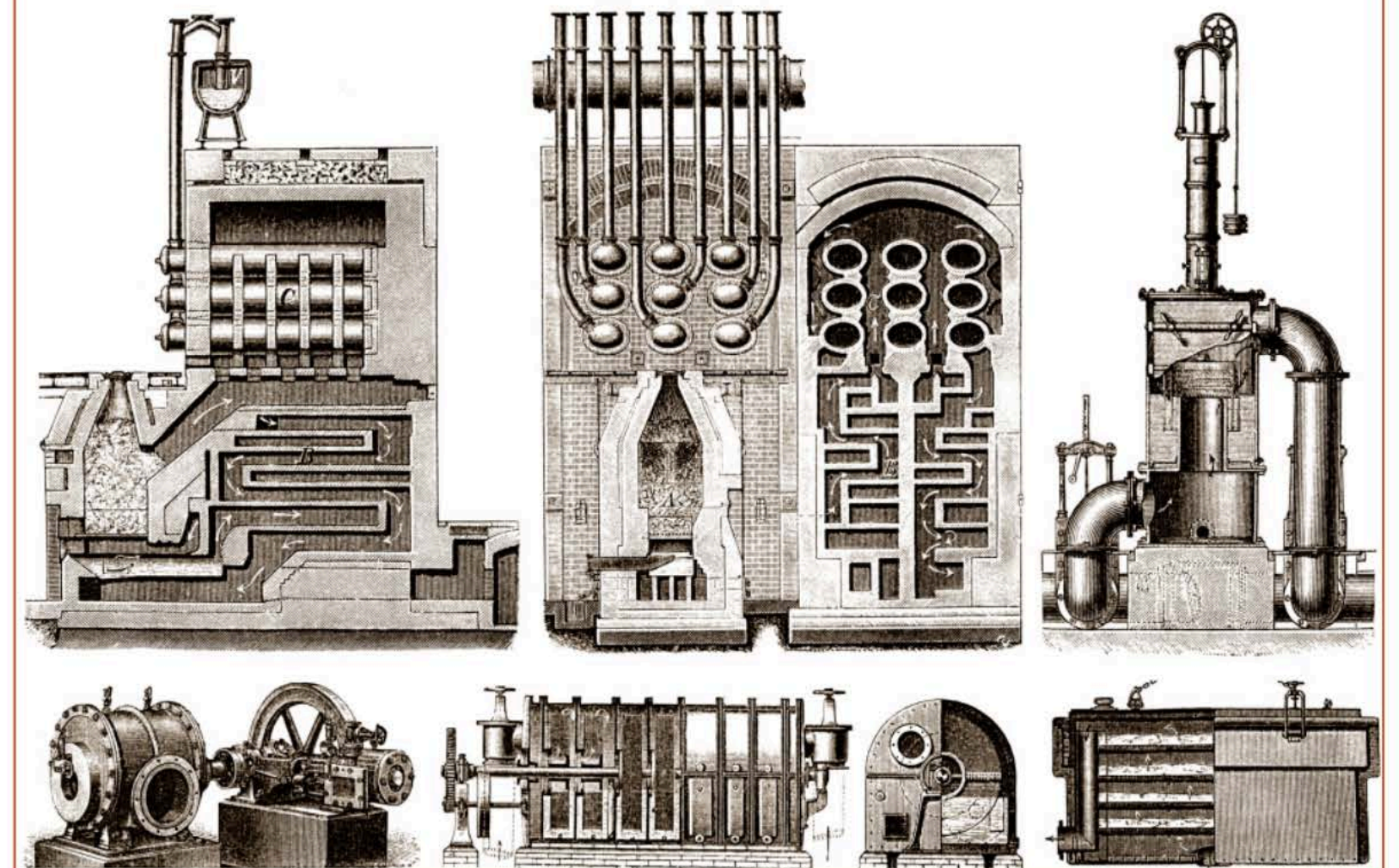


Photo: Schemes of retorts for gas production in Brockhaus Konversation-Lexikon – 19th century



Gas industry in Polish cities

The history of the Polish gas industry as well as its development directions and trends are not very different from those present in the European gas industry – both in terms of technical standards and applications of gas. When Europe and the world were establishing the foundations for the future gas industry, Poland was partitioned and ruled by three countries: Russia, Prussia and Austria.

Photo: A gas compressor against a background of gasworks buildings in Zgorzelec

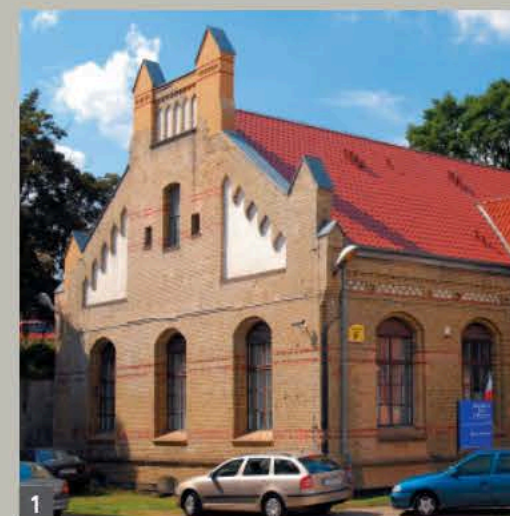


Photo 1: Gas Compressor Station No. 1 – Szczecin Gasworks

Photo 2: The historic premises of the Zgorzelec Gasworks

Photo 3: Wrocław, former gasworks premises in Tarnogaj

For obvious reasons all scientific initiatives related to the development of the gas industry were determined by the general technical condition of the country administering the specific area of Poland and by development programmes imposed by them.

A professor of the Institute of Technology in Kraków, Karol Mohr, is considered the pioneer of the gas industry in the partitioned Poland. In 1830 he designed a small experimental gas plant and as a part of a teaching experiment involving his students lit a few gas lamps in Gołębia Street. However, the project of using gaslight in the city was perceived too audacious at that time. Moreover, financing the construction of gasworks in the political and economic situation of the country at that time was not an easy task. Engineer Nehrebecki made similar attempts in Poznań in 1845. Nevertheless, Polish scientists lacked funds to continue such works.

The gas industry in the western parts of the then Poland (at that time under Prussian rule) developed in more favourable conditions since the German gas industry

was a global leader. It was where the first gas associations were established to build gasworks on an industrial scale and offer street lighting to cities. Gas plants were mainly built by German companies from Berlin, Bremen, Dessau, Dortmund, Dresden, Hamburg and Hannover.

Wrocław

The origins of the gas industry in Wrocław date back to 1843 when Heinrich Mainicke installed gas lighting in his house and workshop and afterwards at the "Złota Gęś" (Golden Goose) restaurant. In 1847 the first gasworks at Tęczowa Street was put into service and the city was lit by 857 gas lamps. Later, three more gasworks were built in Wrocław: the second in 1864, the third in 1881 and the fourth (largest) was erected in 1906. The latter plant was located at Gazowa Street in Tarnogaj and finally became the only producer of gas in Wrocław. Following its modernisation and restructuring in 1927 it became the most modern gasworks in Europe. Initially, the gasworks was the property of the Gas Lighting Society in Wrocław. Then, in about 1857 the ownership was transferred to the local municipal

authorities. The Wrocław Gas Plant ceased to produce coal gas in 1990, after 147 years of the "classic" gasworks' operation.

Szczecin

The municipal authorities of Szczecin initially negotiated with a British company, the Imperial Continental Gas Association. These negotiations, however, were suspended at the end of 1837 and were later resumed but this time with Blochmann's company. Blochmann was tasked with preparing a construction design for the Szczecin gasworks and the necessary system of gas pipes. When the municipal authorities collected the required amount (250,000 thalers) the company from Dresden was ordered to construct the gasworks. Works were commenced in 1846 with the construction of a building with four box-type furnaces each equipped with 10 retorts situated on three levels. Next to the retort house another building was erected where gas was cooled in cooling chambers and then cleared of post-production impurities using filters. The treatment plant was accompanied by two gasholders of 800 m³ and 1600 m³ and office, workshop and warehouse buildings.

The construction of the gasworks was completed in 1848 and on 23 April the first gas lamps were lit in the streets of Szczecin. In 1849 gas was supplied to 1643 consumers, and city streets were lit by 593 gas lamps. The gasworks, situated in an industrial district of Pomorzany, was a municipal investment owned by the city hall of Szczecin. In 1985, after 138 years of operation, the last gas furnaces of the Szczecin gasworks were decommissioned.

Gdańsk

In Gdańsk illuminating gas was demonstrated for the first time in December 1853, after the gas plant on the left bank of the Motława was put into service. Due to the dynamic development of the city the need for gas also increased. In 1870, 2 million m³ of gas were sold. Since it was impossible to expand the plant, another one had to be built. It was put into operation in 1904. The new gasworks was located at Wałowa Street. In 1991 the gasworks stopped producing coal gas; however, for some time the gas system of Gdańsk was supplied with gas from the decomposition of methane-rich natural gas. The production facilities of the Gdańsk gasworks were shut down after 138 years of operation.



Photo: Gdańsk Gasworks – a view from the late 1950s

Poznań

The gasworks in Poznań was launched on 14 November 1856. Located at Grobla Street it was the first large industrial facility in Poznań employing innovative architectural solutions, with numerous process equipment and plants distributed in multiple buildings.

On the day the gasworks was opened the streets and squares of Poznań on the left bank of the river were lit by 414 gas lamps. At the end of 1856, Poznań was lit by 1500 gas lamps. The end of the 19th and beginning of the 20th century was for the gasworks a difficult time of competing with electricity, which necessitated modernisations and ensuring gas quality. On 18 July 1966 the second gas factory was put into service in Poznań – a modern, automated Carburetted Water Gas Plant at Gdynska Street, built on an Austrian licence. This investment doubled the production capacity of gasworks in Poznań. The gasworks at Grobla Street became the headquarters of the Greater Poland District Gas Plant (WOZG) associating 50 gasworks in the region of Greater Poland and Lubusz. In 1973, after 116 years of work for Poznań, the gasworks at Grobla Street was shut down. Two years later WOZG was transformed into the Greater Poland Gas

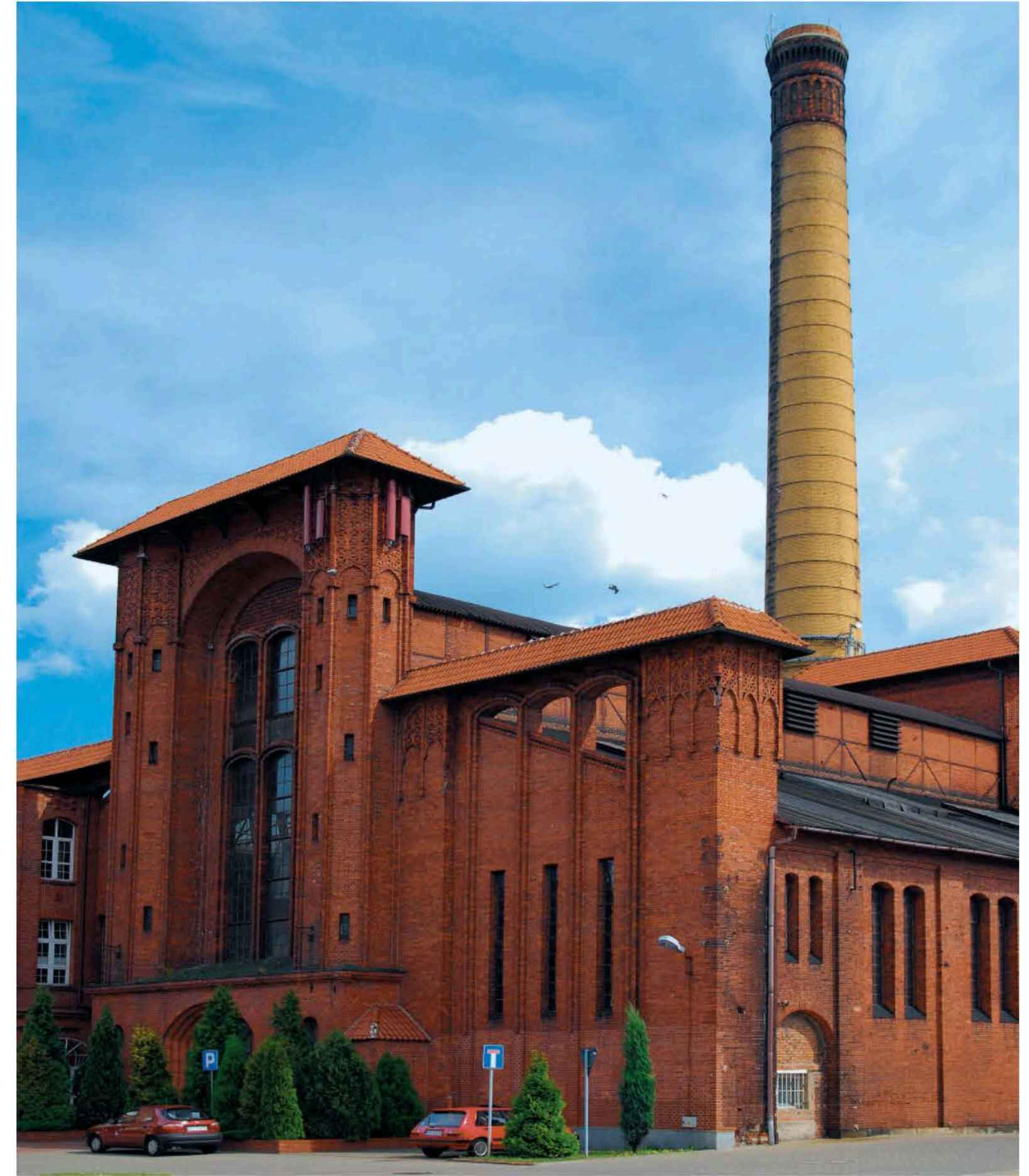


Photo: Poznań Gasworks – an example of a magnificent, monumental industrial edifice resembling a palace

Industry and Oil and Gas Mining Plant. In the 1980s natural gas was supplied to all consumers in Poznań and the Carburetted Water Gas Plant at Gdyńska Street ceased to produce gas.

Silesia

The oldest gasworks in Silesia is the gasworks in Racibórz dating back to 1852. The gasworks in Bielsko-Biała was established in 1861, and a year later Opole had its own gasworks commissioned. On 6 December 1868 the gasworks in Mała Zabrze was put into service and in 1871 gaslight was used, e.g. at the railway station in Zabrze. Following the Silesian Uprisings and the partitioning of Upper Silesia Gazownia Górnośląskie S.A. (Gasworks of Upper Silesia, a joint stock company) was established. The objective was to create an enterprise, independent of Germany, which ultimately was to supply gas to the entire Silesian Region. The assets of the company comprised: the Gasworks in Hajduki Wielkie (later Świętochłowice, built in 1909), a small gasworks in Katowice (1884) and local distribution systems, holder stations, substations and sales outlets. In 1947 the Gasworks in Chorzów became a part of the Gasworks of Upper Silesia (1912). In 1948, following reorganisation, the Gasworks of Upper Silesia merged with other gas plants, thus forming the Upper Silesian Gas Manufacturing Plant No. 1 in Świętochłowice.

In 1928, the Upper Silesian Long-Distance Gas Lines (Ferngas Schlesien) was established. The plant dealt with treating and distributing coke-oven gas, initially from the Makoszowy Coke Plant and Bobrek Coke Plant, followed by Gliwice Coke Plant, Zaborze Coke Plant and Jadwiga Coke Plant.

In 1929, the Gasworks in Zabrze became a part of Verbandsgaswerk Oberschlesien GmbH – the Association of Gas Plants formed as a result of a merger of the Gasworks in Mała Zabrze (1868), Bytom (1880) and Gliwice (1880). After World War II the plants were acquired by the state administration.

On 1 September 1948 the Association of Coke-Oven Gas Plants was formed in Zabrze. It consisted of: the Gasworks of Upper Silesia, the Association of Gas Plants, Upper Silesian Long-Distance Gas Lines, Lower Silesian Long-Distance Gas Lines and the plant in liquidation located in Muchobór. In 1950, it was renamed the Zabrze District Gas Plant and in 1966 became a multi-plant enterprise, taking the name of the Upper Silesian District Gas Plant. In 1982 the entity became a part of the nationwide public utility the Polish Oil and Gas Company (PGNiG). The underlying technical facilities of the plant were compressor stations mostly located where coke-oven gas was manufactured – at the coke plants: Walenty, Zaborze, Jadwiga, Makoszowy,



Photo: The office of the manager of the gas distribution plant in Zabrze – 1920s

Gliwice, Dąbieńsko and Knurów. Dalgaz was a station connecting all other compressor stations. When in the early 1970s natural gas was put into use compressor stations gradually lost their significance and were liquidated. The last compressor station was shut down in Makoszowy in 1998.

Kraków

Kraków was the first city in Poland where gas lighting was demonstrated (in 1830 at Gołębia Street). A 25-year contract concerning city lighting was signed in 1855 with the German Continental Gas Society of Dessau. Gas lamps supplied with gas from gasworks in the district of Kazimierz, built in 1856-1857, lit the city on 22 December 1857. In the first year of its operation the annual gas output was 371,000 m³. On 1 March 1886 the City Gasworks in Kraków became the first municipal enterprise in Kraków, following the termination of the contract with the Society of Dessau which had not invested in the development of the gas system. In 1910 the city limits were extended and a decision was made to build a new gas plant but the plans were blighted by the outbreak of World War I. After the war a decision was made to reconstruct the existing gasworks. In the 1920s and 30s gas was intensively advertised; however, the concurrently developing electricity gradually superseded gas in the field of lighting applications. Gaslight was to be a reserve for the city. 1927 marks the start of modernisation of city gas lighting.

After World War II, when the destroyed gas transmission and distribution enterprise. In 1973 a decision was made to completely shift from coke-oven gas to natural gas. The related works ended in 1982. At present, following the split in the gas trading and distribution functions in Kraków, the Gas Plant in Kraków forming a part Polska Spółka Gazownictwa Sp. z o.o. and the Gasworks in Kraków, reporting to the Carpathian Gas Trading Division of PGNiG S.A. in Tarnów, are in operation.



Photo:
Gas lighting of the arcades at the Cloth Hall
in the Old Market in Kraków

Warsaw

In 1856, upon the approval of the Tsar's governor, Ivan Paskevich, the Administrative Council of the Kingdom of Poland authorised the Warsaw city authorities to conclude a contract and grant a licence to build the Gas Plant to the German Continental Gas Society of Dessau. The contract was concluded on 1 May 1856 as a notarial deed and granted the licensee the exclusive right to illuminate the streets of Warsaw with gaslight for 25 years. The Gas Society of Dessau built a gas factory at Ludna Street (No. 10/16). The plant was called the Powiśle Gasworks and Warsaw saw gaslight for the first time on 27 December 1856 when 92 gas lamps supplied with illuminating gas were lit along Ludna, Książęca, Nowy Świat and Krakowskie Przedmieście Streets and in the Castle Square. Initially, gas was mainly used to illuminate streets. With time, it was commonly used for heating of premises, heating of water, in gas cookers, irons etc. Due to the continuously increasing requirement for gas, in 1888 in the district of Wola at Dworska (now Kasprzaka) Street (No. 25) Gas Plant No. 2 was opened. At the end of the 19th century the Chemical Factory of the City Gasworks of the Capital City of Warsaw was established to process the products of the gasworks (e.g. pitch). During World War I the gasworks was intact. In 1925-1930 the ownership of the gas plant was transferred to the municipality. It was renamed the Warsaw City Gasworks and modernised. On 19 December 1930, after 74 years of operation, the gas factory in Ludna Street was closed down.

When war broke out, the severely damaged City Gasworks operated under the control of the Germans. The plant, partly expanded, continued its production activity until 22 September 1944. The Germans took away nearly all movable assets and prepared the buildings for demolition but they only managed to destroy the oldest retort house. Gas flow in the system was restored on 25 June 1945, and the opening of the gas plant was celebrated on 3 July 1945.

Other investments included a natural gas pipeline and a producer gas station built in 1950. In the same year the city handed the gasworks over to the state (Central Gas Board) as the Warsaw District Gas Plant. In the 1950s the requirement for gas continuously and dynamically increased. In March 1959 a new Carburetted Water Gas "VIAG" generating station was put into service. In November 1961 deliveries of coke-oven gas from Upper Silesia started.

From 1966 the gas system was adapted to the transmission of natural gas; a high-pressure gas pipeline on the Puławy-Warsaw route and a natural gas rotting plant were built. Gas from the rotting plant, mixed with natural gas, was distributed as city gas until April 1978. The production of coal gas was discontinued in 1970 and city gas generation eight years later. Since that time the inhabitants of Warsaw have been supplied with natural gas.



Photo: Warsaw Gasworks at former Dworska Street – machine room from 1888 – now the seat of the Museum of Gas Industry at Kasprzaka Street No. 25

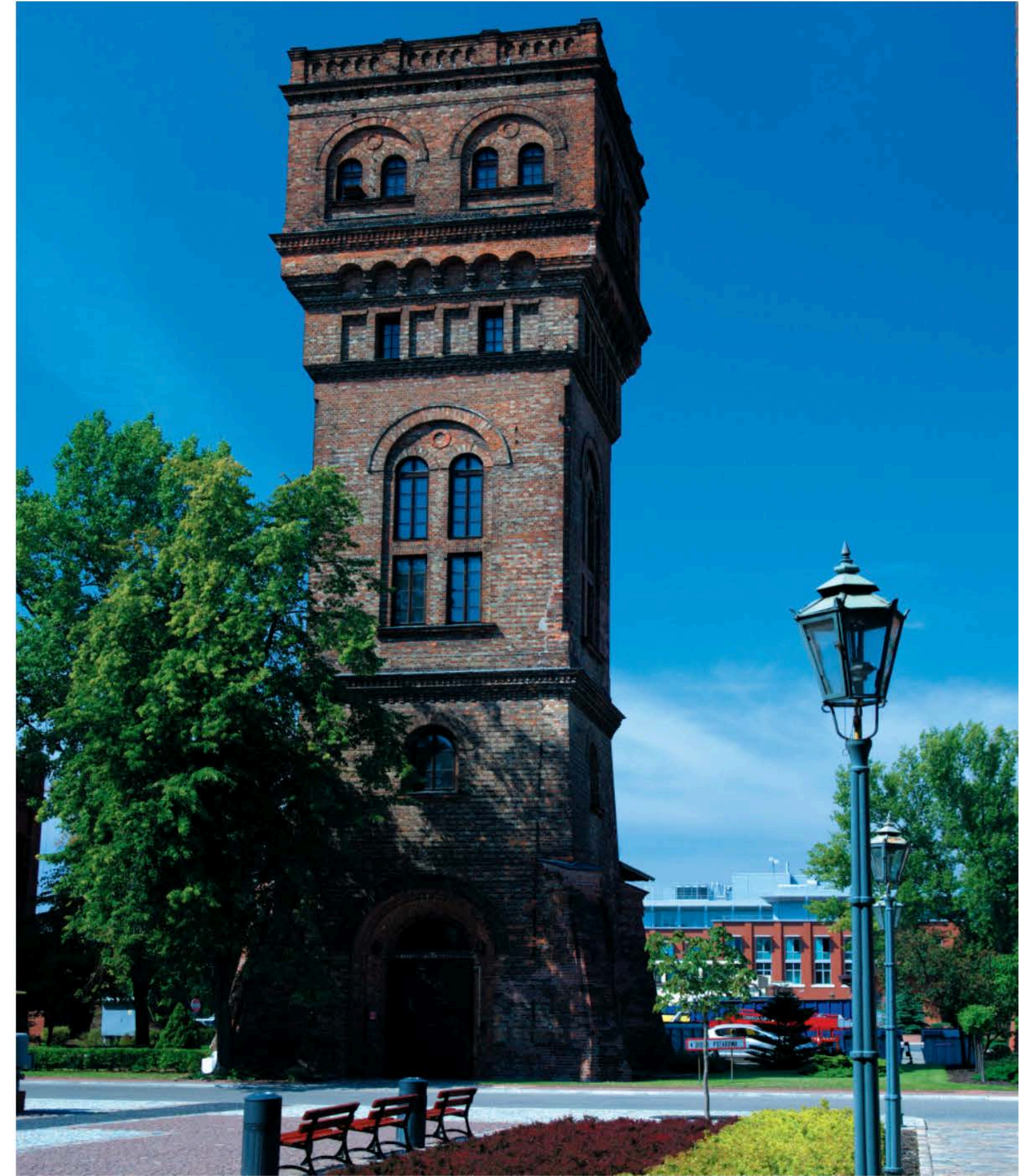


Photo: Water tower from 1887 – Warsaw Gasworks

Summary

The start of the development of the gas industry in the present-day territory of Poland in the mid 19th century coincided with the construction (1847-1857) of the largest gas plants in Wrocław, Szczecin, Gdańsk, Poznań, Warsaw and Kraków. Also, medium-size cities and smaller towns built their own gasworks.

In the second half of the 19th century the following gasworks were constructed in Poland: Racibórz (built in 1852), Rawicz (built in 1857, shut down in 1975), Elbląg (1859-1976), Toruń (1859-1979), Bydgoszcz (1860-1972), Gorzów (1860-1979), Nysa (1860-1983), Bielsko (1861-1967), Opole (1862-1967), Katowice (1863-1976), Kołobrzeg (1864-1980), Grudziądz (1865-1974), Leszno (1864-1975), Krotoszyn (1865-1986), Tczew (1866-1974), Łódź (1867-1979), Chełmno (1867-1971), Stargard (1868-1979), Kalisz (1871-1973), Gniezno (1872-1978), Lublin (1881-1970), Sopot (1885-1953), Nakło (1886-1989), Olsztyn (1890-1974), Paczków (1896-1977), Bartoszyce (1897-1988), and Łębork (1898-1987).

The number of gasworks built in the “territory of Poland” was connected with the general level of technology represented by respective partitioners and their characteristic management system. The highest number of gasworks was built in the area under Prussian rule, considerably less under Austrian rule and the least in the territory controlled by the Russians. After World War I Poland had 136 gasworks, of which 105 were in the area under Prussian rule, 19 under Austrian rule and 12 in the territory controlled by the Russians, not to mention cities in oil fields which were supplied with natural gas.

The number of gasworks in the “territory of Poland” grew until the end of World War I. When Poland regained independence in 1918 the classic gas industry was in serious trouble – mainly due to the lack of good quality coal, problems with selling the by-products, in particular coke, and as a result of increasing competitive advantage of electricity and natural gas. At that time a dozen or so small gasworks were wound up in the territory formerly under Prussian rule. On the other hand, in 1926-1932 only two new gasworks (in Radom and Gdynia) were built. The general level of coal gas production in Polish gasworks was a fixed figure totalling ca. 170 million m³ of gas a year.

In terms of technology Polish gasworks went through the full stage of development: from primitive grate furnaces with brick retorts to modern continuous operation chambers fired with gas supplied from central producers. The legacy gasworks, following multiple alterations and modernisations, were adapted to the needs of modern technology.

In a relatively short time furnaces with horizontal and vertical chambers both in periodic and continuous operation were put into use. At the end of 1925 in Poland there were 252,876 gas meters with a total of 1,527,922 “metered flames” and a gas system of 2077.3 kilometres. The gas system was mostly constructed from cast iron pipes.

It must be emphasized that Poland was not a power in terms of the number of gasworks and quantity of gas produced from coal, but it was one of the first territories in Europe, and perhaps in the world, where natural gas was extracted and used in the 19th/20th century. And in the interwar period the natural gas transmission system in the Subcarpathian region started developing along with the use of this gas as fuel.

Meanwhile in the early 1930s in Polish oil fields of that time (south of Lviv) natural gas was already used as fuel for gas boilers, forges, internal combustion engines, and for the heating and lighting of households. At that time an outline of a great plan for national gasification emerged. It was based on the use of natural gas, coke-oven gas and coal gas produced by local city gasworks.

World War II devastated Polish gas plants but in 1945, after liberation, the assets of the Polish gas industry were considerably improved: the number of local gasworks increased to 263, half of which operated from the beginning and the remaining plants were gradually put into service. The year 1950 marked another stage in the development of the Polish gas industry; at that time the Central Gas Board was established as a body in charge of district gasworks. Simultaneously, after the local government's association was disestablished, control over local gasworks was transferred to the uniform state administration.

The gas industry continued to develop in the second half of the 20th century when the requirement for gas fuels dynamically increased and progress in national gasification was only possible if natural gas was used in industry and in households. Transmission networks were built, consumers of coal gas were shifted to natural gas and classic gasworks producing coal gas were gradually wound up.

The history of the use of natural gas is as absorbing as the production of illuminating and coal gas. Natural gas extracted from soil by its own pressure was known already in ancient times. The first records of natural gas being distributed via bamboo tubes come from China and date back to the 9th century BC. But that is another story... ■



Photo 1: The workers of the City Gasworks in Łódź in a laboratory; the interwar period

Photo 2: The lamplighters of the City Gasworks in Łódź getting ready for work – ca. 1914

Photo 3: A general view of the City Gasworks in Łódź – ca. 1914

