

Biography of Werner von Siemens

Werner Siemens – the “von” was added in 1888 – lived in an age characterized by major changes in all areas of life. In his youth, a process of industrialization began that would accelerate at the end of the 19th century and make Germany a world-leading industrial nation within only a few decades. On the one hand, this development provided the right conditions for the growth of Siemens & Halske. On the other, it was decisively influenced by Siemens himself and by the business activities of the company he founded.

Werner von Siemens was born near Hanover, Germany, on December 13, 1816, the fourth of 14 children. His father was a tenant farmer from a family with a long middle-class tradition. Due to the family’s reduced circumstances, it was difficult for the children to obtain an education in line with their parents’ ambitions. As a result, Werner von Siemens left secondary school without a degree in 1834. In the same year he joined the Prussian army, where he studied science and technology. A three-year training program at the Artillerie- und Ingenieurschule (army’s artillery and engineering school) in Berlin provided a solid foundation for his future work in what was then the new field of electrical engineering.

The Prussian army was particularly interested in rapid, dependable communications. In 1847, Werner von Siemens built a pointer telegraph that was completely reliable and far superior to all previous systems of its type. This innovation laid the basis for the Telegraphen-Bauanstalt von Siemens & Halske, the telegraph construction company that Werner von Siemens and precision mechanic Johann Georg Halske founded in Berlin on October 1, 1847. In 1849, Werner von Siemens left the army to devote himself fully to the new electrical enterprise.

Within a few decades, Siemens & Halske advanced from a small precision engineering workshop – which made not only electric telegraphs and telegraph systems (its main products) but also electrically triggered railroad warning bells,

water meters and seamless gutta-percha insulation – to become a leading manufacturer of electrical equipment. A few years after its establishment, the company was also operating internationally. And in the summer of 1848, Siemens & Halske landed its first large-scale, highly prestigious government commission: the order to build a telegraph line from Berlin to Frankfurt am Main, a distance of over 650 kilometers. However, good relations with the Prussian Telegraph Administration did not last long. There were no further contracts, and the young company was plunged into a crisis that was only mastered by rigorously tapping markets outside Germany. Orders from Russia in particular triggered an upturn in business at the beginning of the 1850s. In 1851, the Russian Telegraph Administration commissioned Siemens & Halske to build and maintain the country's telegraph network, which extended some 9,000 kilometers from the Baltic to the Black Sea. Implemented under the management of Werner von Siemens' younger brother, Carl von Siemens, the project was completed in the mid-1850s. The company's cable business, which was managed from England, became a second key pillar of the enterprise. Wilhelm Siemens, another of the founder's brothers, achieved a breakthrough in this field by producing and laying submarine telegraph cables. The laying of a transatlantic cable from Ireland to the U.S. in the years 1874 to 1875 was a much-heralded success.

Few entrepreneurs were as intensively committed to international business projects as were Werner von Siemens and his brothers. With their inventions and enterprises, they sought global success from the very beginning. This ambition was driven above all by the company's founder, who, looking back in later years, acknowledged that his aim had been to create "an enterprise of world standing comparable of that of Fugger" – and that he had always considered the company to be his family's main sphere of activity. Writing to his brother Carl at the end of 1887, he stated: "I see the business only secondarily as a financial asset. For me, what I've founded is more an empire and something I'd like to leave undiminished to my descendants so that they can continue to work within it." As his words reveal, the key motivations behind Werner von Siemens' entrepreneurial activity were an orientation toward his family and a strongly felt duty to provide for his immediate relations – first for his siblings and later for his children. By involving family members in his business operations, he also assured himself of a group of loyal and capable employees whom he could also deploy abroad.

In addition to his business activities, Werner von Siemens was intensively devoted to scientific research. In 1866, he made what was probably his most significant contribution to electrical engineering when, building on the work of Michael Faraday, he discovered the dynamo-electric principle and thus laid the basis for the use of electrical energy as a source of power. A report that Werner von Siemens submitted to the Berlin Academy of Sciences at the beginning of 1867 showed him to be not only a scientist intent on finding the causes of observed phenomena but also an engineer and far-sighted entrepreneur, who, on the basis of his experience with the experimental device that he had constructed, dared to state: "Technology has been given the means at present to generate electric power of unlimited strength inexpensively and easily wherever labor is available. The fact will be of essential importance [...]."

Heavy-current technology, as power engineering was then called, developed at a relentless pace. By constantly expanding the technology's fields of application, Siemens' inventions played a decisive role in its further development. In 1879, Siemens & Halske demonstrated the world's first electric railway with external power source at the Berlin Commercial Exposition. Newly developed differential arc lamps from Siemens & Halske were installed for the fair in Berlin's Kaisergalerie, a shopping arcade built on the Paris and Brussels model in one of Berlin's central quarters. Three years later, the company installed Berlin's first permanent electric street lights on Potsdamer Platz and Leipzig Straße. Electric lighting systems for train stations, office buildings, factories and harbor facilities soon followed. In 1880, Werner von Siemens constructed the world's first electric passenger elevator. The next year, Siemens & Halske put into operation the world's first electric streetcar in the Berlin suburb of Groß-Lichterfelde. By the time of Werner von Siemens' death in 1892, Siemens & Halske alone was producing 1,000 dynamo machines a year and generating annual revenue of nearly 20 million marks. The name Siemens had become synonymous with power engineering – a term coined by Werner von Siemens himself.

Werner von Siemens' reputation for progressive entrepreneurship is due not only to his technological innovations and daring business undertakings but also to his numerous social initiatives. In 1866, Siemens & Halske issued its first so-called inventory premium, the forerunner of today's employee profit sharing plans. Already in 1872, Siemens set up a Pension, Widows and Orphans' Fund – a pension

scheme that anticipated the creation of Germany's national pension system by more than a decade. Not only did the fund serve a humanitarian purpose; it also supported the company's personnel policies. In the face of acute shortages of qualified employees and high rates of fluctuation, Werner von Siemens was eager to build up and retain a permanent workforce of loyal, highly qualified experts at his ever-expanding company. In retrospect, he noted that the motives behind these voluntary benefits had been "not just humanity, but rather healthy egoism".

Werner von Siemens was a political leader as well as a scientist and entrepreneur. From 1862 to 1866, he represented the liberal Deutsche Fortschrittspartei in the Prussian state assembly. He was an enthusiastic supporter of patent protection in Germany. In 1877, he joined the newly established Kaiserliches Patentamt (Imperial Patent Office, today's German Patent and Trade Mark Office). In 1879, he was involved in setting up the Elektrotechnischer Verein, the German engineering society, which encouraged the introduction of electrical engineering departments at technical universities. When the Physikalisch-Technische Reichsanstalt (today's Physikalisch-Technische Bundesanstalt, PTB) was established, Werner von Siemens confirmed his dedication to the sciences by donating funds and land in the mid-1880s for the institute's construction in Berlin's Charlottenburg district. Werner von Siemens not only formulated fundamental technological principles but – as a scientist and entrepreneur – always focused on the marketability of the products and systems solutions that he discovered. During his lifetime, the pioneering electrical engineer received numerous honors in recognition of his services to both science and society. These honors included an honorary doctorate from the philosophy department of the University of Berlin (1860), an appointment to the Royal Prussian Academy of Sciences in Berlin (1873) and investiture as a member of the Prussian Order Pour le Mérite for Science and the Arts (1886). In 1888, he was raised to the nobility by German Emperor Friedrich III. Werner von Siemens officially retired in 1890 but continued to exercise an important influence on the business of Siemens & Halske until his death on December 6, 1892.

For press pictures and further information on Werner von Siemens, please see www.siemens.com/press/200years-WvS

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