

SIEMENS - ZGODBA O PREVODNOSTI MOČ NAPREDKA V EVROPI IN NA SLOVENSKEM

SIEMENS - A STORY OF CONDUCTIVITY THE POWER OF PROGRESS IN EUROPE AND IN SLOVENIA

Slikovno gradivo / Pictorial material: **Dolenjski muzej Novo mesto**
Mestni muzej Ljubljana
Muzej novejše zgodovine Slovenije
Narodna in univerzitetna knjižnica
SiemensForum, München
Tehniški muzej Slovenije
Zgodovinski arhiv Ljubljana
Zgodovinski arhiv Ljubljana, Enota v Škofji Loki
Tadej Brate

Fotografije / Photography: **Metevž Paternoster**
Marjan Ciglič
SiemensForum
Nada Žgank in Domen Pal,
dokumentacija Tehniškega muzeja Slovenije
Aleksandra Vajd

Razstava je nastala v sodelovanju /
The exhibition was created in collaboration



SIEMENS

Ustanovitev podjetja in prvi dosežki

The Company's Founding and First Achievements

SIEMENS - ZGODBA O PREVODNOSTI
MOČ NAPREDKA V EVROPI
IN NA SLOVENSKEM
SIEMENS - A STORY OF CONDUCTIVITY
THE POWER OF PROGRESS
IN EUROPE AND IN SLOVENIA



Ernst Werner von Siemens
(1816-1892)

Leta 1816 rojeni Ernst Werner Siemens je prve izkušnje na področju tehničnih inovacij pridobil v pruski vojski. Kot inženirski kadet je imel možnost raziskovanja in eksperimentiranja. Kasneje je svoje življenjsko poslanstvo našel v podjetništvu in inovatorstvu; slednje mu je prineslo svetovno slavo in nemški plemički naziv. Werner von Siemens, Johann Georg Halske in Wernerjev bratranec Johann Georg Siemens (ta je pri zagonu podjetja izdatno finančno pomagal) so leta 1847 v Berlinu ustanovili podjetje za izdelavo telegrafov (Telegraphen-Bauanstalt von Siemens & Halske). Večji del inovacij in proizvodnega programa te družbe je bil v naslednjih desetletjih povezan s tehnologijo komunikacij.

Ernst Werner Siemens (born in 1816) gained his initial experience in the field of technical innovations in the Prussian army. As an engineering cadet, he had the possibility of conducting research and experiments. Later on, he found his true calling in entrepreneurship and innovations. These brought him worldwide fame and earned him his title of nobility (the addition of von to his name). In 1847, Werner von Siemens, Johann Georg Halske and Werner's cousin Johann Georg Siemens (who provided substantial financial assistance to start up the company) founded a company in Berlin to manufacture telegraphs (Telegraphen – Bauanstalt von Siemens & Halske). Over the next decades, a large part of this company's innovations and production programme was connected with communication technology.



Johann Georg Halske
(1814-1890)

Werner von Siemens in Johann Georg Halske sta se kasneje zaradi različnih pogledov na skupno podjetje razšla, a sta ostala prijatelja. Halske je kariero nadaljeval v politiki – kot mestni svetnik.

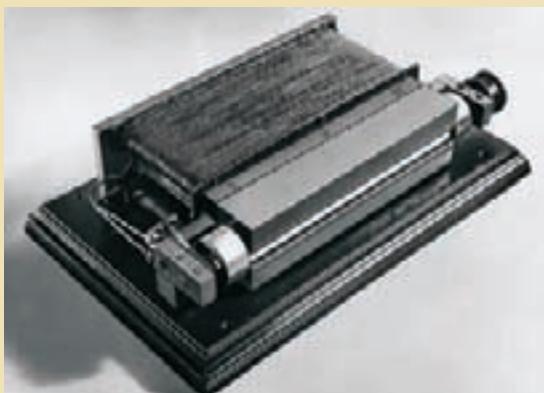
Due to different views regarding the joint venture, Werner von Siemens and Johann Georg Halske later agreed to go their separate ways, but they remained friends. Halske decided to pursue a career in politics – as a town councillor.



Telegraf s kazalcem, 1847. / A pointer telegraph.

Telegraf je naprava, ki s pomočjo električnih signalov oddaja ali sprejema sporočila. Werner von Siemens se je z njo prvič srečal v vojski. Električni telegraf je bil v začetku štiridesetih let 19. stoletja pretežno nov izum, ki je doživil neprestane izboljšave. Tudi Siemens je izboljšal delovanje telegraфа – izdelal je lastno napravo iz preprostih elementov: pločevinaste škatlice za cigare, pločevinaste ploščice, koščkov železa in izolirane bakrene žice. Izboljšava je bila v razdalji, ki jo je lahko premagalo sporočilo. Prvi Siemensov telegraf je oddajal do razdalje 50 km.

The Telegraph is a device that uses electrical signals to transmit or receive messages. Werner von Siemens first came across this device while in the army. In the early 1840's, the electric telegraph was a fairly new invention, which was undergoing continuous improvement. Siemens also contributed to improving the telegraph's operation by building its own device from simple elements: tin cigar boxes, tin panels and pieces of iron and insulated copper wire. Improvement represented the distance you can beat message. The first telegraph Siemens made was able to transmit messages over a distance of 50 km.



Dinamo / Dynamo

Leta 1866 se je na področju proizvodnje in uporabe električne energije začela nova doba. Takrat je Siemens odkril t. i. elektrodinamični princip, ki je omogočil komercialno uporabo že znanega dinama (generatorja enosmerne napetosti). Dynamo s pomočjo elektromagneta pretvarja mehanično energijo v električno. Proizvodnja električne energije je postala hitrejša in varnejša, predvsem pa je bilo mogoče s tehnologijo, ki jo je razvijal Siemens, ekonomično proizvajati večje količine električne energije. Ta inovacija je odprla vrata obsežni elektrifikaciji, ki je v mnogočem spremenila industrijsko podobo sveta. V prihodnosti naj bi se po predvidevanjih poznavalcev prevlada električne energije kot vsespolno uporabnega energenta še okreplila.

In 1866, a completely new era emerged in the field of electricity generation and use. It was then that Siemens discovered the dynamo-electric principle which enabled the already known dynamo (a generator that produces direct current) to be put to practical use. The dynamo converts mechanical energy into electricity with the help of an electromagnet. As a result, electricity production became faster and safer – and, through the technology that Siemens developed, it also became possible to economically produce large quantities of electricity. This innovation opened the door to large-scale electrification, which in many ways brought industrial change around the world. According to expert predictions, the dominant position of electrical energy as a universally usable energy source will become even stronger in the future.

$\mu\text{S cm}^{-1}$

Ime Wernerja von Siemensa je eno od imen zgodnjih raziskovalcev in inovatorjev iz časa industrijske revolucije, ki se je uvrstilo tudi v mednarodni sistem enot (SI – Système International d'Unités). Siemens oziroma »s« predvsem v elektrotehniki pomeni električno prevodnost.

The name Werner von Siemens is one of the names of early researchers and innovators from the Industrial Revolution period that are listed in the International System of Units (SI - Système International d'Unités). In the International System of Units, the Siemens (abbreviated as S) is the standard unit of electrical conductance.



Werner von Siemens
na bankovcu za
20 mark, 1929.
Werner von Siemens
on a 20 Deutsche
Mark banknote, 1929.

Električna razsvetjava – znanilec napredka

Electric Lighting – an Indicator of Progress

SIEMENS - ZGODBA O PREVODNOSTI
MOČ NAPREDKA V EVROPI IN NA SLOVENSKEM
SIEMENS - A STORY OF CONDUCTIVITY
THE POWER OF PROGRESS IN EUROPE AND IN SLOVENIA

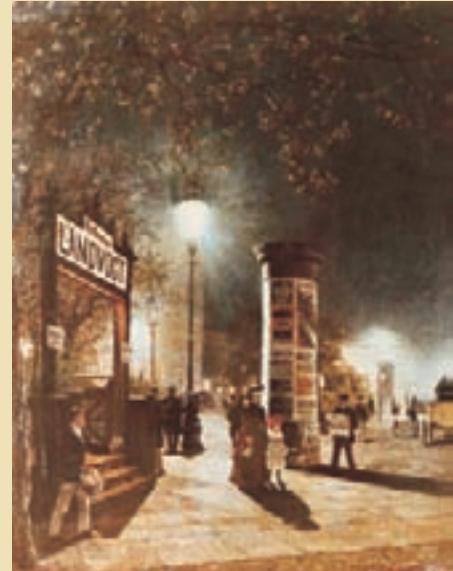
Žaloma se vse razstavila in še niti potrebovala, da se iznajdita, da električna lampa zamenjuje množino plinov, pa deljajoči skupaj tako potrdi, kakor je to znalo na koncu v Londonu. Da je temparaturni žarnik znamenit, ki ga električna lampa namerjava, in kateri vodi najboljši, katerih prizki so bili včasih razpoložni, da bi po 10 minutah več bili v napovedani vremeni. Tako skupaj je bila razstava podružna, tisto, kolikor želimo, kolikor želimo in kolikor želimo. Konec v tem razstavljajočem je iznajdil v dnevi, kar je postavil v pogostno tempo, druge nočne urabljive, trdja električnični lenti in zadrži takratni žarnik, ostarej po električni vrednosti. In tako je, da se razstava v prvih dneh, kar je potrebovala, včasih v drugeh ne lečigri podala karlo znamenit, in nac v včasih dobro bolj od zna. — Ite in da se ne more aličati, da bi z posredom električnih svetilki razstavljenih množičnih mogli hujanje rasti, in ne manjše prejstvo atingirajoče žarnice je odzadnjevalec nujno. Mi se nego in predstavljajo. All včasih zaznali, da posredom razstavljajočih žarnic, kar pripravijo, da res stekanina, kar znamenitosti podala. Kaj da je stekanina kot, se množice včasih zastopajo, in to povevno, da je razstavljajoča žarna, ki je nato takrat občutljivih žarnicih, včasih spusti.

Kaj vse je v domišljiji ljudi pomenila električna luč, nam sporoča pisec članka v Kmetijskih in rokodelskih novicah 27. marca 1880.

All the things electric lights represented in people's imagination according to an article in the Slovenian newspaper Kmetijske in rokodelske novice, published on 27 March 1880.

Uporabnost električne razsvetljave je postala najbolj vidna ob uvajanju električne razsvetljave. Prvo javno električno razsvetljavo je podjetje Siemens & Halske postavilo na Leipziški ulici in Potsdamskem trgu v Berlinu. Žarnice so zasvetile 20. septembra 1882 zvečer; dva dni zatem je o dogodku poročal tudi Laibacher Zeitung.

The usefulness of electricity became most apparent with the introduction of electric lighting. The first public electric lighting was installed by Siemens & Halske in Berlin on the Leipzig street and Potsdam market. The light bulbs first started glowing in the evening of 20 September 1882. Two days later, even the Laibacher Zeitung newspaper reported this event.

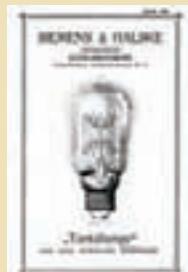


Ena od ključnih komponent razvoja električne razsvetljave je bil razvoj žarnic. Prve uporabne žarnice so imele številne pomanjkljivosti. Moč njihove svetilnosti je nihala, včasih so le brlele, pogosto so pregorevale, predvsem pa so bile drage. Prve žarnice (t. i. diferencialne obločnice) so v Siemensovi tovarni izdelali leta 1878.

The development of bulbs was one of the key components in the development of electric lighting. The first usable light bulbs had many shortcomings; there were fluctuations in their light output, sometimes they only flickered, they would often burn out and, mainly, they were quite expensive. The first light bulbs (the differential arc lamps) were made by the Siemens factory in 1878.

Leta 1882 je Siemens v Nemčiji ustanovil prvo tovarno žarnic. V žarnici je bistveni element material, ki pod vplivom električnega toka žari (kasneje tudi plin v žarnici). V prvih Siemensovih žarnicah so žarela ogljikova vlakna. Številni raziskovalci so iskali alternativo: od ogljika, bambusovih vlaken (Thomas Alva Edison) do različnih kovin. Od leta 1905 so izdelovali žarnice z gorilno nitko iz tantala, ki so bile prava prodajna uspešnica, saj so jih samo v Nemčiji do leta 1914 prodali okoli 50 milijonov.

In 1882, Siemens established the first light bulb factory in Germany. An essential element in the light bulb is the material that glows under the influence of electric current (and later on, also the gas inside the light bulb). The first Siemens light bulbs were carbon filament light bulbs. Many researchers were looking for an alternative: from carbon to bamboo fibre (Thomas Alva Edison) and various metals. From 1905 onwards, tantalum wire was used as the material for filaments in light bulbs. These light bulbs sold very successfully; in fact, by the year 1914, around 50 million had been sold in Germany alone.



Iz delavnic tovarne Siemens Schuckert Werke je okoli leta 1910 na trg prišla nova žarnica Wotan, ki je porabila manj električne energije in je imela boljšo svetilnost.

The new Wotan light bulb, which consumed less energy and gave brighter light, came to the market from the Siemens-Schuckert-Werke factory's workshops sometime around 1910.



Reklame za žarnice v slovenskem časopisu, 1912, 1915.
Advertisements for light bulbs in Slovenian newspapers.

Zgodnje obdobje Siemensove prisotnosti na Slovenskem

The Early Period of Siemens' Presence in Slovenia

SIEMENS - ZGODBA
O PREVODNOSTI
MOČ NAPREDKA V EVROPI
IN NA SLOVENSKEM
SIEMENS - A STORY
OF CONDUCTIVITY
THE POWER OF PROGRESS
IN EUROPE AND IN SLOVENIA



Fužine v Radovni, okoli 1910.
The ironworks in Radovna, around 1910.



Litija, 1900.

Leta 1894 se je škofjeloški tovarnar Alois Krenner odločil zgraditi vodno elektrarno, v kateri bi proizvajal energijo za razsvetljavo svoje tovarne. S Škofjo Loko se je dogovoril, da bo v mestu na lastne stroške postavil električne luči, mesto pa se je obvezalo plačevati stroške žarnic in električne energije. To je bila prva javna razsvetljava na Slovenskem. Vse naprave je dobavilo in namestilo podjetje Siemens & Halske.

In 1894, Alois Krenner, a factory owner from Škofja Loka, decided to build a hydroelectric power station in order to generate energy for the lights in his factory. He made an agreement with the town of Škofja Loka to install electric lights in the city at his own expense, while the city committed itself to pay for the costs of light bulbs and electricity.

This was the first public lighting in Slovenia. All the equipment was supplied and installed by the company Siemens & Halske.

Na Slovenskem so o uporabi električne energije za razsvetljavo nemških mest brali v časopisih, kmalu zatem pa so tudi pri nas zasvetile žarnice v tovarnah in delavnicih, nato pa še na mestnih ulicah.

In Slovenia, people read in the newspapers that electricity was being used to light up cities in Germany and, soon afterwards, light bulbs were also being used in our country to light up factories and workshops, and later also on the city streets.

Filozofija delovanja Siemensovega podjetja je bila povezovanje inovacij, produkcije in trženja. V slednje je Siemens vključeval tudi svoje brate, ki so po različnih koncih Evrope pridobivali naročila. Prvo Siemensovo dokumentirano poslovno sodelovanje na Slovenskem je njegov dogovor s Kranjsko investicijsko družbo pri proizvodnji jekla v Zoisovih fužinah na Radovni leta 1869. Pri tem je bila uporabljena Siemensova tehnologija, ki je v svoji končni obliki znana kot Siemens-Martinova peč.

The operational philosophy of the Siemens company was to combine innovation, production and marketing. In his operations, Siemens also included his brothers, who were getting orders from customers in different parts of Europe. Siemens' first documented business collaboration in Slovenia was a project in the field of iron production with an investment company from Kranj at the Zois ironworks in 1869. For this project, they used Siemens' technology, which in its final form became known as the Siemens-Martin furnace.

Na Slovenskem je prvo razsvetljavo v prostoru namestil ljubljanski podjetnik Gustav Tönnies maja 1881. Njegovo razsvetljavo, za katero je elektriko proizvajal manjši parni stroj, so preizkusili tudi na Kongresnem trgu in v parku Zvezda. Nato se je električna luč začela nezadržno širiti. Mariborski podjetnik Karel Scherbaum je v svojem parnem mlinu umetno luč vzpostavil leta 1883, torej le leta zatem, ko so pričeli električne luči v Berlinu. Leta 1885 je bila elektrificirana razsvetljava zdravilišča v Laškem, leta 1888 pa v topilnici svinca in srebra v Litiji. Leta 1890 so z elektriko razsvetlili delavnice Južne železnice v Mariboru in vodarno v Klečah pri Ljubljani.

The first electric lighting in Slovenia was installed in May 1881 by Gustav Tönnies, an entrepreneur from Ljubljana. His lighting, for which electricity was generated by a small steam engine, was tested in Ljubljana at the Congress Square and the Zvezda Park. The electric light then began to spread in an unstoppable way. Charles Scherbaum, an entrepreneur from Maribor, installed artificial lighting in his steam mill in 1883, only a year after the electric lights turned on in Berlin. Electric lighting was installed at the health resort in Laško in 1885 and at the lead/silver smelter in Litija in 1888. In 1890, electricity lit up the Southern railway workshop in Maribor and the water treatment plant in Kleče, Ljubljana.



Škofja Loka, okoli 1890 / around 1890.

Električna razsvetljava je bila bistvena tudi za razvoj turizma v Postojnski jami; gre za enega prvih električno razsvetljenih objektov pri nas, jama je bila tudi ena prvih z lastno železnicijo za prevoz turistov. Tako železnicijo kot razsvetljavo je priskrbel Siemens.

Electric lighting was also a significant factor for the development of tourism in the Postojna cave. The cave was one of the first places in our country that had electric lighting installed and also one of the first places that had its own railway to transport tourists inside the cave. Siemens took care of installing the lights and constructing the railway.

V Ljubljani so električno razsvetljavo najprej doobile javne zgradbe in tovarne; leta 1885 na primer deželna bolnišnica, ki je sama proizvajala tudi električno energijo, prav tako pivovarna Union in Tobačna tovarna Ljubljana. Leta 1896 je podjetje Siemens & Halske na lastne stroške postavilo malo parno elektrarno na današnji Prešernovi cesti in z njo razsvetljevalo Narodni dom.



Mobilna »elektrarna« z žarometom, s kakršnim so najverjetne osvetlili Narodni dom, okoli 1873. A mobile power station with a headlamp such as the one that was most probably used to light up the National Centre, around 1873.

Deželna bolnica na Zaloški cesti v Ljubljani, okoli 1905.

The provincial hospital in Ljubljana on the road named "Zaloška cesta", around 1905.



Proizvodni prostori Tobačne tovarne Ljubljana, okoli 1910.

The manufacturing facilities of the tobacco factory in Ljubljana, around 1910.



Narodni dom v Ljubljani, okoli 1905.

The National Centre in Ljubljana, around 1905.



In Ljubljana public buildings and factories were the first to have electric lighting installed. The provincial hospital, which also produced its own electricity, and also the Union Brewery (pivovarna Union) and the Tobacco Factory in Ljubljana had lights installed in 1885. In 1896, the company Siemens & Halske constructed a small steam power station (at its own expense) on the road which is now named "Prešernova cesta" and used it to light up the National Centre (Slovene: Narodni dom).

Ljubljanska mestna elektrarna

The Ljubljana City Power Station

SIEMENS - ZGODBA O PREVODNOSTI
MOČ NAPREDKA V EVROPI IN NA SLOVENSKEM
SIEMENS - A STORY OF CONDUCTIVITY
THE POWER OF PROGRESS IN EUROPE AND IN SLOVENIA



Ivan Hribar
(1851-1941)



Od leta 1861 je ljubljanske ulice osvetljevala plinska razsvetjava. Novosti in iznajdbe na področju električne energije so tudi ljubljanske mestne oblasti spodbudile, da so že 1889 začele razmišljati o postavitvi mestne elektrarne. Poleg župana Ivana Hribarja je bil gonilna sila teh prizadovanj šolski ravnatelj in občinski svetnik Andrej Senekovič.

From 1861 onwards, the streets of Ljubljana were illuminated by gas lighting. But the city authorities encouraged the development of innovations and inventions in the field of electricity and, by the year 1889, they were already thinking about constructing a city power station. Two people that represented a driving force in this endeavour were Ivan Hribar (the Mayor of Ljubljana), and Andrej Senekovič (the school principal and a municipal councillor).

Andrej Senekovič
(1848-1926)



Objekt stare mestne elektrarne danes služi kulturi in umetnosti. V dvorani stavbe, ki predstavlja tehniški in zgodovinski spomenik, se odvijajo sodobne plesne in gledališke predstave, koncerti in performansi. Stara elektrarna nudi oder predvsem mladim in inovativnim umetnikom, ki se predstavljajo v okviru festivala Mladi levi.

Today, the old city power station serves a cultural and art related purpose. The hall, which is also a technical and historical monument, is used for contemporary dance performances, theatrical performances, concerts and other performances. The old power station provides a stage which is mainly intended for young and innovative artists who present themselves within the context of the "Young Lions" festival (Slovene: festival Mladi levi).



Hitra zgodba / A Quick Story,
Sanja Nešković Peršin, Branko Potočan, 2006.

Na razpis mestne občine za postavitev elektrarne se je prijavilo več podjetij, ki so za postavitev predlagala različne lokacije na Savi in Ljubljanici. Izbrano je bilo podjetje Siemens & Halske, ki je predlagalo postavitev parne elektrarne v mestu. Tako je na Slomškovi ulici nastala elektrarna, ki je začela proizvajati elektriko 1. januarja 1898. Odločitev za elektrarno kaže na usmerjenost tedanje mestne uprave v prihodnost, vendar je z današnjega zornega kota vprašljiva tehnična odločitev za enosmerni tok, ki ga je takrat ponekod po svetu že izpodival dvosmerni.

A number of companies responded to the municipal office's tender for the construction of the power station and proposed various locations for its construction along the Sava River and Ljubljanica River. The company Siemens & Halske, which proposed constructing a steam power station in the city, was selected to carry out this task. So, the power station was constructed on the street named "Slomškova ulica" and it began producing electricity on 1 January 1898. The decision to construct this power station shows that the city administration of that time was oriented towards the future, however, the technical decision to use direct current, which in some places around the world already was already being replaced by alternating current, may be considered questionable from today's point of view.



Začetna pogonska moč elektrarne je komaj zadoščala za razsvetljavo mestnih ulic in za razsvetljavo po nekaterih domovih. Že dve leti po odprtju je bilo potrebno vanjo namestiti dodatni stroj, saj je naraščalo število odjemalcev in zmogljivosti niso več zadoščale. Ko so leta 1905 gradili Hotel Union, se je ponovno pojavila potreba po večanju zmogljivosti elektrarne, saj je bilo predvideno, da bo samo v hotelu žarello več kot 600 žarnic po 16 sveč.

The power station's initial driving power was barely sufficient to power the lights on the city streets and in a number of homes. Only two years after it had opened, it was already necessary to install an additional machine into it as its capacities were no longer sufficient for the growing number of consumers. When Hotel Union was built in 1905, it was once again necessary to increase the power station's capacity as it was expected that the hotel alone would have more than 600 light bulbs, each using 16 watts of power.



Podjetje Siemens & Halske je bilo nadvse zadovoljno s sodelovanjem pri zgraditvi mestne elektrarne in se je zato mestu zahvalilo z darilom – velikim plinskim lestencem za dvorano na magistratu, ki je bil kasneje predelan za električno razsvetljavo in še danes služi svojemu namenu.

The company Siemens & Halske was very pleased to take part in the construction of the city power station and decided to thank the city by giving it a gift - a large gas chandelier for the town hall. The chandelier was later modified to run on electricity and it is still serving its purpose today.



Hitrejši pretok informacij povezuje svet

Faster Flow of Information Connecting the World

SIEMENS - ZGODBA O PREVODNOSTI
MOČ NAPREDKA V EVROPI IN NA SLOVENSKEM
SIEMENS - A STORY OF CONDUCTIVITY
THE POWER OF PROGRESS IN EUROPE AND IN SLOVENIA



Karl Siemens
(1829–1906)

Zgodnje obdobje Siemensovega raziskovanja in poslovnega udejstvovanja je bilo povezano s telegrafijo. Z večanjem doseg, v katerem so naprave zmogle prenašati signal, se je večala tudi razdalja in krajšal čas posredovanja sporočil. Prvo večje naročilo za postavitev telegrafske linije je Siemens opravil leta 1848, ko je povezal 500 kilometrov oddaljeni mesti Berlin in Frankfurt. Za prenos sporočila med mestoma je bila potrebna le še ena ura.

The early period of Siemens' research and business engagement activities was linked to telegraphy. By increasing the range in which the device could transmit a signal, it lengthened the distance over which messages could be carried and shortened the transmission time. Siemens carried out its first larger order for the installation of telegraph lines in 1848, connecting Berlin and Frankfurt, which were 500 kilometres apart. It took only one hour for a message to be transmitted from one city to the other.

Delovanje podjetja Siemens & Halske je pritegnilo pozornost v Rusiji, državi velikih razdalj. Prvo naročilo Siemensa v Rusiji je bila dobava 75 telegrafov za povezavo med Moskvo in St. Peterburgom leta 1851. Tako zatem so sledila naročila, iz katerih je nastalo rusko telegrafsko omrežje od Finske do Krima, dolgo okoli 10.000 km. Uspeh s telegrafijo v Rusiji je povzročil, da je družba Siemens & Halske v St. Peterburgu ustanovila svojo podružnico, ki jo je vodil Wernerjev brat Karl Siemens.



Tovarna Siemens & Halske v St. Peterburgu.
The Siemens & Halske factory in Petrograd.

The Siemens & Halske company's operations attracted much attention in Russia - a country that stretches over long distances. The first order Siemens got in Russia was to supply 75 telegraphs to establish connection between Moscow and St. Petersburg in 1851. Immediately after this, a number of orders followed, giving rise to the Russian telegraphy network. The network was approximately 10,000km in length and extended from Finland to the Crimea. Due to the success of telegraphy in Russia, the company Siemens & Halske established a branch office in St. Petersburg, which was headed by Werner's brother Karl Siemens.



Sir William Siemens
(1823–1883)

Širitev na tuje trge je bila ena od pomembnih strategij podjetja Siemens & Halske. Podružnico so ustanovili tudi v Londonu; vodil jo je Wernerjev brat William, ki je 1863. leta postavil tovarno za izdelavo kablov v bližini Londona.

The company's expansion into foreign markets was one of the most important strategies that Siemens & Halske implemented. It established a branch office in London, which was headed by Werner's brother William, who built a cable factory near London in 1863.



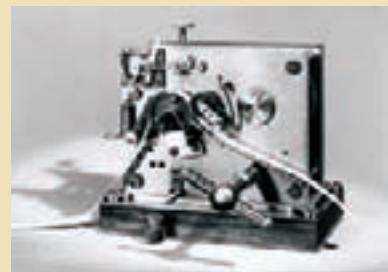
Siemensova tovarna kablov v Angliji.
The Siemens cable factory in England.

Med letoma 1867 in 1870 je podjetje Siemens & Halske gradilo telegrafsko zvezo med Londonom in Kalkuto, t. i. Indoevropsko telegrafsko linijo. Mesti sta bili sicer že povezani, a je imela ta telegrafska povezava precej pomanjkljivosti, povezanih predvsem z vmesnimi telegrafske postajami, kjer so ljudje, nevešči angleščine, posredovali telegramne naprej. Siemensova linija je vključevala določeno stopnjo avtomatizacije, kar je izboljšalo kakovost in hitrost prenosa sporočil. Čas dostave telegrama iz Londona v Kalkuto je bil takrat le še pol ure. Pomemben uspeh je bila tudi položitev telegrafskega kabla med Evropo in Severno Ameriko leta 1874.

The Indo-European telegraph line was built by Siemens & Halske. The project lasted from 1867 to 1870 and the line extended from London to Calcutta. The cities were previously already connected, but the telegraph line had many deficiencies, mainly related to the intermediate telegraph station, where the telegrams were forwarded by people who were deficient in English. This telegraph line included a certain degree of automation, which improved the quality and speed of message transmission. It took just half an hour for a telegram to go from London to Calcutta. Another major achievement was when Siemens & Halske laid a telegraph cable between Europe and North America in 1874.



Hughesov telegraf, izdelan v Siemensovi tovarni,
1. polovica 20. stoletja.
The Hughes' telegraph, made in the Siemens Factory during the first half of the 20th century.



Aparat za luknjanje telegrafskega papirja na Indoevropski telegrafske liniji, 1867.

A paper-punching device, used for the Indo-European telegraph line, 1867.

Javni transport v mestih poganja elektrika

Public Transportation Powered by Electricity

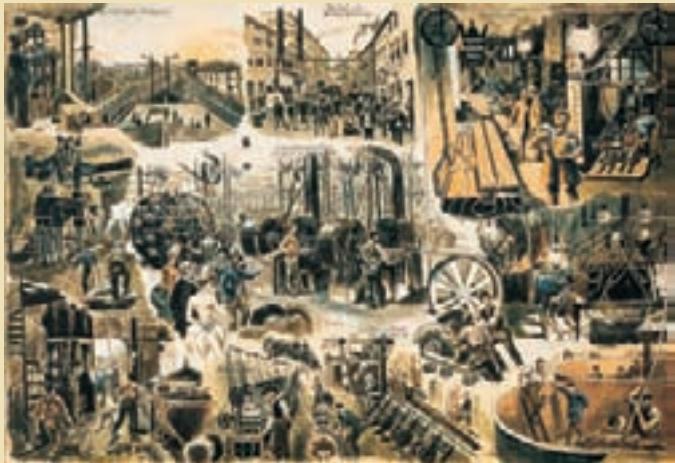
SIEMENS - ZGODBA O PREVODNOSTI
MOČ NAPREDKA V EVROPI IN NA SLOVENSKEM
SIEMENS - A STORY OF CONDUCTIVITY
THE POWER OF PROGRESS IN EUROPE AND IN SLOVENIA

Javni transport s konjsko vprego v Novem mestu, okoli 1900.
Public transportation pulled by horses in Novo mesto, around 1900.



Z rastjo mest in večanjem števila prebivalstva v njih je postajalo vedno pomembnejše vprašanje javnega transporta. Poskusi s parnimi lokomotivami se v mestih zaradi dima niso obnesli, prav tako so se za nezadostne izkazali tramvaji in »avtobusi«, ki so jih vlekli konji.

Due to the fact that cities and their populations were growing, public transport was becoming a more and more important issue. Steam locomotives didn't work out well in the cities because they produced too much smoke; and the trams and "horse buses" also turned out to be insufficient.



Siemensova proizvodnja v Berlinu leta 1886.
The Siemens factory in Berlin, 1886.

V tovarni Siemens & Halske v Berlinu so proizvajali najrazličnejše izdelke, ki so bili rezultat tedanjih odkritij. Siemens je bil eden tistih redkih inovatorjev, ki so rezultate svojih poskusov nemudoma pretvorili v proizvodnjo uporabnih reči. Tako po izumu elektrodinamičnega principa je že razmišljal tudi o električnem transportu.

The Siemens & Halske factory in Berlin manufactured a wide variety of products which were the result of discoveries from that time. Siemens was one of the few innovators who immediately converted the results of his tests into useful products. Immediately after the invention of the electrodynamic principle, he already began thinking about electric transportation.



Na berlinskem sejmu leta 1879 je Werner Siemens predstavil prvo električno železnico. Majhna električna lokomotiva je vlekla vagone, na katerih je bilo skupaj okoli 20 sedežev. Zanimanje na sejmu je bilo veliko, vendar je bila uporabnost te prve električne lokomotive omejena. Lokomotiva se je napajala iz tretjega tira, ki je bil neprestano pod napetostjo in je pomenil nevarnost za ljudi, ki so prečkali progo.

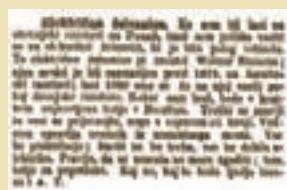
Werner Siemens introduced the first electric railway at the Berlin Trade Fair in 1879. A small electric locomotive pulled wagons, on which there was a total of about 20 seats. This aroused a great deal of interest at the fair, but the first electric locomotive's usefulness was limited. The locomotive was powered from a third-rail track, which was constantly under tension and posed a risk for people crossing the tracks.

Vozni red tramvaja v Berlinu leta 1881.
A timetable for trams in Berlin, 1881.



Nenavadna električna železnica na berlinskem sejmu je bila zadostno »čudo«, da so o njej poročali tudi v slovenskih časnikih.

The unusual electric railway presented at the Berlin Fair was such a "wonder" that even the Slovenian newspapers reported about it.



Soča, 28. januar 1881.
Soča, 28 January 1881.

Prva električna cestna železnica je prišla v uporabo v Berlinu leta 1881. Siemens jo je zgradil na lastne stroške, kar je bila pogosta poslovna poteza podjetja. Lastni vložek v večje infrastrukturne projekte je podjetje Siemens & Halske kompenziralo z lastništvom in trženjem električnih železnic, telegrafskih linij in elektrarn.

The first electric trams began running in Berlin in 1881. Siemens built the tramway at his own expense - a business strategy frequently used by the company. Siemens & Halske received compensation for its investment into major infrastructure projects through its ownership and marketing of electric railways, telegraph lines and power stations.



Podjetje Siemens & Halske je izvedlo tudi zgraditev prve podzemne železnice na evropskem kontinentu, in sicer v Budimpešti leta 1896.

In 1896, Siemens & Halske also carried out the construction of the Budapest subway - the first underground railroad in continental Europe.

Prvi električni javni transportni sistemi na Slovenskem

The first electric public transport system in Slovenia

SIEMENS - ZGODBA O PREVODNOSTI MOČ NAPREDKA V EVROPI IN NA SLOVENSKEM
SIEMENS - A STORY OF CONDUCTIVITY THE POWER OF PROGRESS IN EUROPE AND IN SLOVENIA

Slovenska mesta niso dosegala dimenzij velikih evropskih mest, vendar pa so se večala, s čimer se je krepila tudi potreba po ureditvi javnega transporta. V Ljubljani, ki je leta 1898 dobila elektrarno, so bili s tem dani pogoji za gradnjo tramvajskega omrežja.

Compared to Europe's large cities, Slovenian cities were smaller in terms of size and population density; however, they were growing and so was the need to improve public transport. Consequently, Ljubljana, which got its first power plant in 1898, achieved the conditions for the construction of a tram network.

Fantazijski motiv Ljubljane na razglednici, okoli 1900.

A fantasy motif of Ljubljana on a postcard, from around 1900.



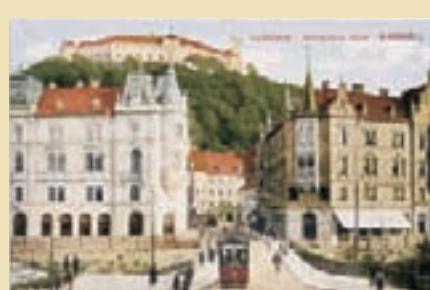
Že leta 1896 je Ljubljana dobila dovoljenje za zgraditev cestne železnice. Poleti 1899 se je ljubljanski občinski svet odločil, da pogodbo za gradnjo električne cestne železnice sklene s podjetjem Siemens & Halske. Mesto je obvezalo podjetje k odkupu vseh zemljišč, hiš in adaptacij mostov za železnico. Pogodba je določala, da železnica ostane last podjetja, da se dobiček deli med podjetje in mesto ter da lahko mesto čez 25 let celotno podjetje odkupi. Podobni pogoji še danes veljajo za javno-zasebna partnerstva pri upravljanju javne infrastrukture.

Ljubljana obtained permission to build the tramway in 1896. In the summer of 1899, the Municipal Council of Ljubljana decided to award the contract for the construction of the electric tramway to the company Siemens & Halske. The company was bound by the contract to buy all the land, houses and renovations of bridges for the tramway. The contract stipulated that the tramway would remain the company's property yet the profit would be divided between the company and the city and that, after 25 years, the city could buy the entire company. Similar conditions still apply to public-private partnerships in the management of public infrastructure.



6. septembra 1901 je bil tramvaj predan v promet. 5220 metrov proge je povezovalo glavno mesto železniško postajo in vojaško bolnico na Zaloški cesti ter Mestni trg in dolenjski kolodvor na Dolenjski cesti. Začetne zamisli so bile sicer veliko bolj ambiciozne, vendar predrage in za majhno mesto, kot je bila Ljubljana, tudi ekonomsko nesmiselne. Do resnejše modernizacije prog je prišlo šele po letu 1930, ko sta bili najprej zgrajeni progi v Šiško in na Vič.

The tramway began operating on 6 September 1901. 5,220 metres of track connected the city's main railway station to the military hospital on the road named "Zaloška cesta", to the Town Square and to the railway station named "dolenjski kolodvor" on the road named "Dolenjska cesta". The initial ideas were far more ambitious, yet too expensive (and also economically unwise) for a small city like Ljubljana. More serious modernization of the tramway lines only took place after 1930, when lines were built to the districts of Šiška and Vič.



Prvi električni javni transportni sistemi na Slovenskem

The first electric public transport system in Slovenia

SIEMENS - ZGODBA O PREVODNOSTI MOČ NAPREDKA V EVROPI IN NA SLOVENSKEM
SIEMENS - A STORY OF CONDUCTIVITY THE POWER OF PROGRESS IN EUROPE AND IN SLOVENIA

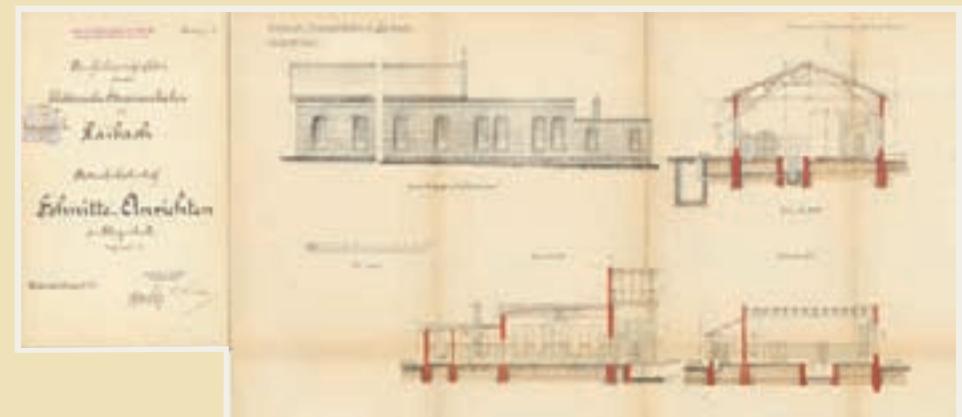
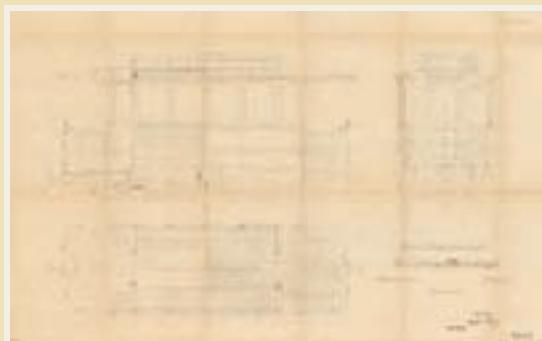


Po prvem navdušenju in prvih vožnjah s tramvajem so ljubljanci ugotovili, da je vožnja, sploh glede na prevoženo razdaljo, razmeroma draga. Števil potnikov se je zmanjšalo. Tramvaj je bil sicer velika tehnična novost za mesto. Nad glavami ljubljancov so se pojavile žice, po mestu so se razlegali novi zvoki koles in opozorilnih zvoncev na tramvajskih vozovih.

After the initial enthusiasm and the first tram rides, the people of Ljubljana found that the tram rides were relatively expensive (especially considering the distance travelled) and so the number of passengers shrank. Nevertheless, the tram was a great technical innovation for the city. The city now had trams powered by overhead cables and new sounds produced by tram wheels and warning bells.

Družba Siemens je ostala prisotna v Ljubljani tudi po odprtju tramvajske proge. Bila je lastnica 1902. leta ustanovljenega podjetja na Dunaju, ki je imelo v lasti (upravljanju) tramvajsko progo v Ljubljani. Leta 1927 je mestna občina odkupila dve tretjini delnic maloželezniške družbe, njen sedež pa se je preselil v Ljubljano. Večino modernizacijskih del so do začetka 2. svetovne vojne izvajale družbe v okviru Siemensa.

The company Siemens remained in Ljubljana after the opening of the tramway lines. It also owned a company in Vienna which had been founded in 1902 and was responsible for (managing) the tramway line in Ljubljana. In 1927, the Municipality of Ljubljana bought two-thirds of the shares of the tramway company and moved the company's head-quarters to Ljubljana. Until the beginning of World War II, most of the modernization works were carried out under the responsibility of Siemens.



Množično slovo od tramvaja 20. decembra 1958.
A crowd gathers to say goodbye to the tramway on 20 December 1958.

Zadnjo vožnjo je ljubljanski tramvaj opravil 20. decembra 1958. Odločitev o ukinitvi te oblike javnega transporta v Ljubljani je bila sprejeta v želji po nenehni modernizaciji in odpovedovanju staremu. Danes velja, da je bila ta odločitev slaba, oživljajo pa se zamisli o ponovni zgraditvi tramvajskih prog v Ljubljani.

The last tram ride in Ljubljana took place on 20 December 1958. The decision to eliminate this form of public transport in Ljubljana was made in the hope of continuous modernization and to get rid of old outdated methods. Today, it is believed that this was a bad decision – and the idea of rebuilding the tramway lines in Ljubljana is being revived.

V Piranu so o električni železnici začeli razmišljati sredi devetdesetih let 19. stoletja, ko se je začela gradnja ozkotirne železnice, ki je Istro povezala s Trstom. Ta je Piran dobesedno izpustila, zato so Pirančani železniško ministrstvo na Dunaju zaprosili za dovoljenje, da zgradijo poseben tir iz Pirana do proge, ki je potekala skozi Lucijo in Portorož. Ker dovoljenja ni bilo, so leta 1909 zgradili trolejbusno progo, ki je povezovala Piran in Portorož. Ko je bilo leta 1911 izdano dovoljenje za gradnjo tramvajskih prog, je Piran pri podjetju Siemens Schuckert naročil izdelavo železnice. Odprta je bila 20. julija 1912 in je obratovala do leta 1953.



Tramvaj na Tartinijevem trgu v Piranu leta 1911.
Tram on Tartini Square in Piran, 1911.

In Piran, they started thinking about building an electric tram system in the mid 1890s, when the construction of the narrow railway line linking Istria and Trieste began. This literally excluded Piran, so Piran sent a request to the railway ministry in Vienna for permission to build a special line from Piran to the line which ran through Lucija and Portorož. Since no permission was granted, in 1909, they built a trolleybus line that connected the towns of Piran and Portorož. When permission to build a tramway line in Piran was finally granted in 1911, the company Siemens Schuckert was assigned the task of constructing the tramway line, which began operating on 20 July 1912 and remained in operation until 1953.

Zgodnje obdobje potrošništva

The Beginning of the Consumer Era

SIEMENS - ZGODBA O PREVODNOSTI
MOČ NAPREDKA V EVROPI IN NA SLOVENSKEM
SIEMENS - A STORY OF CONDUCTIVITY
THE POWER OF PROGRESS IN EUROPE AND IN SLOVENIA



S širjenjem področja delovanja je podjetje, ki ga je vodila druga generacija družine Siemens, odločno zakorakalo tudi v svet izdelkov široke potrošnje. Že takrat so namreč prepoznali ogromen tržni potencial, ki se skriva v delu človekovega življenja, povezanem z gospodinjstvom in prostim časom.

The expansion of the company's operations, led by the second-generation of the Siemens family, stepped straight into the wide realm of consumer products. By this time, they had already recognized the tremendous market potential that lies within a part of life related to both household and leisure time activities.

Prvi Siemensov vakuumski sesalec je bil izdelan leta 1906.

The first Siemens vacuum cleaner was made in 1906.



Ko je leta 1923 v Nemčiji začel oddajati radio, je Siemens na trgu nastopil s svojim prvim radijem Siemens D-Zug.

When Germany began radio broadcasting in 1923, Siemens presented its first radio to the market. This radio was named the Siemens D-Zug.



Sredi dvajsetih let so bili izdelani prvi električni štedilniki Protos EKH.

The first Protos EKH electric cookers were made during the mid-twenties.



Leta 1964 je Siemens izdelal prvi pomivalni stroj.
Siemens made its first dishwasher in 1964.

V Kraljevini Jugoslaviji je imela v Zagrebu sedež družba Jugoslovanska Siemens, d. d. Podružnico je imela tudi v Ljubljani, kjer so predvsem tržili Siemensove izdelke, nastopali pri nekaterih infrastrukturnih projektih ter zagotavljalni montažo in servis.

In the Kingdom of Yugoslavia, the company Jugoslovansko Siemens d.d. had its headquarters in Zagreb, but it also had a branch office in Ljubljana, where they mainly marketed Siemens products, took part in some infrastructure projects and provided installation and repair services.



Siemensove reklame v slovenskem časopisu, trideseta leta 20. stoletja.

Advertisements for Siemens in Slovenian newspapers during the 1930s.

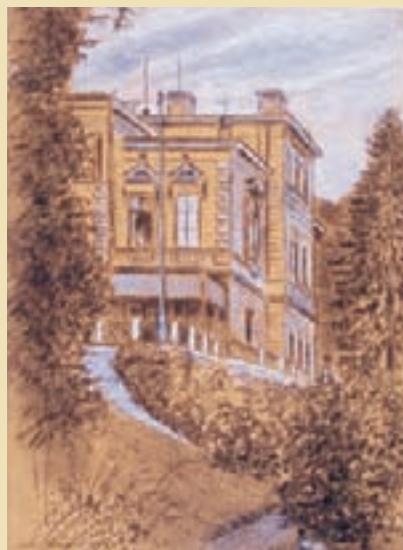
Po drugi svetovni vojni je Siemens v slovensko elektroindustrijo vstopil z dogovorom o sodelovanju s kranjskim podjetjem Iskra leta 1973. Iskra je od Siemensa pridobila polprevodne elemente sistema Simatic, Siemens pa od Iskre tiste proizvode, ki jih v Nemčiji niso izdelovali. Od začetka osemdesetih let je bil Siemens prisoten tudi v Gorenjevi tovarni malih gospodinjskih aparativov v Nazarjah. Konec osemdesetih let prejšnjega stoletja sta Siemens in kranjska Iskra skupaj ustanovila specializirano podjetje za razvoj in proizvodnjo telekomunikacijske opreme z imenom Iskratel.

After World War II, Siemens entered the Slovenian electric industry through a collaboration agreement signed in 1973 with Iskra – a company from Kranj. Iskra obtained the semiconductor elements of the Simatic system from Siemens and Siemens obtained the products that were not manufactured in Germany from Iskra. From the beginning of the eighties, Siemens was also present in the Gorenje factory of small household appliances in Nazarje. At the end of the 1980s, Siemens and Iskra founded a specialized company together for the development and manufacturing of telecommunications equipment named Iskratel.

Razvoj telefonije

The Development of the Telephone

SIEMENS - ZGODBA O PREVODNOSTI
MOČ NAPREDKA V EVROPI IN NA SLOVENSKEM
SIEMENS - A STORY OF CONDUCTIVITY
THE POWER OF PROGRESS IN EUROPE AND IN SLOVENIA



Vila Samassa, Beno Puteani, oglje, pastel, 1931.
The Samassa Villa - a pastel and charcoal drawing by Beno Puteani, 1931.



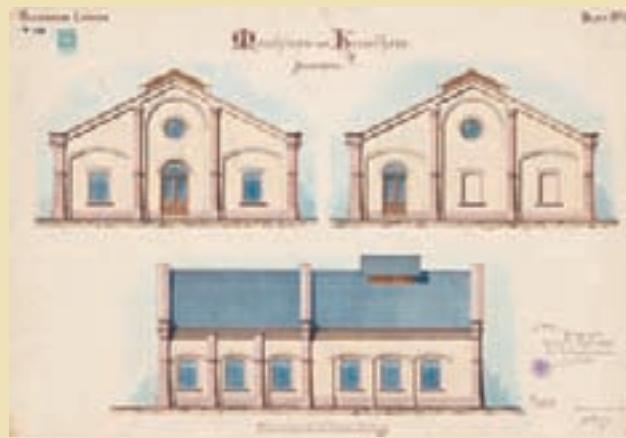
Alexander Graham Bell
(1847–1922)

Siemens & Halske je leta 1890 napeljal telefonsko povezavo med vodovodno postajo v Klečah in pisarno vodovodnega urada v Beethovnovi ulici.

In 1890, Siemens & Halske installed a telephone line which ran from the water supply station in Kleče to the waterworks office on the street named "Beethovnova ulica".

Pod prvi uporabni telefon je podpisana ameriški inovator Alexander Graham Bell, ki je leta 1876 patentiral svoj izum. Že v prihodnjem letu je v Ljubljani tovarnar Albert Samassa s telefonom povezel svojo tovarno in 140 metrov oddaljeno pisarno. Istega leta je Graško telegrafsko ravnateljstvo namestilo dva telefona – enega v Gradcu in drugega v Mariboru. Leta 1881 je poskus s telefonom izvedel ljubljanski urar in elektromehanik Josip Geba, ki je naslednje leto izdelal telefonsko povezavo po telegrafskem kablu med požarno opazovalnico na ljubljanskem gradu in prostori prostovoljnega gasilskega društva. Slovenski inovatorji so uporabljali za tisti čas napredno tehnologijo in so se po svoji tehnični spretnosti brez težav primerjali z bolj industrializiranimi državami na zahodu Evrope. Istega leta je namreč Siemens v Berlinu izdelal telefonsko omrežje za osem naročnikov.

The first usable telephone was made by the American inventor Alexander Graham Bell, who patented his invention in 1876. The following year, Albert Samassa, the owner of a factory in Ljubljana connected his factory by telephone to his office which was 140 metres away. That same year, the telegraph management in Graz installed two telephones - one in Graz and the other in Maribor. In 1882, Josip Geba, a clockmaker and electrician from Ljubljana, installed a telephone line from the fire-observatory in the tower of the Ljubljana Castle to the Volunteer Firefighters Association through the telegraph cable. Slovenian innovators used technology that was considered advanced at the time and their technical skills could be easily compared to those of the more industrialized countries in Western Europe. That same year, Siemens developed a telephone network in Berlin for eight subscribers.



Že leta 1886 je podjetje Siemens & Halske izdelalo načrt vzpostavitve telefonskega omrežja v Ljubljani, vendar ni bil izveden, ker je bilo premalo zanimanja. Svoje telefonsko omrežje je Ljubljana dobila šele leta 1897, naročnikov je bilo 66. Ob koncu prve svetovne vojne je bilo naročnikov še vedno zelo malo – 155. Telefonska omrežja so imeli v tem času še Koper, Piran, Gorica, Tržič in Maribor, še 42 slovenskih mest pa je imelo telefone na poštnih uradih ali žandarmerijskih postajah.

In 1886, the company Siemens & Halske had already made plans to set up a telephone network in Ljubljana; however, due to a lack of interest, this plan was not carried out. It wasn't until 1897 that Ljubljana got its telephone network, with 66 subscribers. At the end of World War I, the number of subscribers was still very low – only 155. Other cities that had telephone networks at that time were Koper, Piran, Gorizia, Monfalcone and Maribor, while 42 Slovenian cities had telephones at post offices or gendarmerie stations.



Telefonska slušalka Siemens & Halske, okoli 1880.

A telephone handset made by Siemens & Halske, around 1880.



Zidna slušalka Siemens & Halske (1880–1890).

A wall mounted telephone made by Siemens & Halske (1880–1890).



Ročna telefonska centrala Siemens & Halske, začetek 20. stoletja.

A hand-operated telephone exchange made by Siemens & Halske (the early 20th century).



Jutro, 27. februar 1927.

Jutro (a leading Slovenian interwar liberal newspaper), 27 February 1927.

Naraščanje potreb po telefonskih priključkih in želja po avtomati-zaciji povezovanja telefonskih naročnikov sta sprožila pobudo, s katero je leta 1927 Ljubljana dobila prvo avtomatsko telefonsko centralo podjetja Siemens & Halske. Centrala še danes deluje v Muzeju pošte in telekomunikacij v Polhovem Gradcu.

The growing demand for telephone connections and the telephone subscribers' desire for an automated interactive telephone communication system launched an initiative in 1927 through which Ljubljana got its first automatic telephone exchange from Siemens & Halske. This telephone exchange is now at the Museum of Post and Telecommunications in Polhov Gradec and is still in working order.

Razvoj telefonije

The Development of the Telephone

SIEMENS - ZGODBA
O PREVODNOSTI
MOČ NAPREDKA V EVROPI
IN NA SLOVENSKEM
SIEMENS - A STORY
OF CONDUCTIVITY
THE POWER OF PROGRESS
IN EUROPE AND IN SLOVENIA



Siemensovi teleprinterji na testiranju, Berlin, okoli 1959.
Siemens teleprinters being tested, Berlin, around 1959.

Čas po drugi svetovni vojni je bil v telekomuni-kacijah tudi čas razvoja in uporabe teleprinterjev.

The post-World War II period was also a time of telecommunications development and increased use of teleprinters.

Pravo malo revolucijo na področju telefonije je prinesel digitalni elektronski stikalni sistem, ki pomeni eno najbolj razširjenih tehnologij telefonskih central na svetu in prvo alternativo analognim telefonskim centralam. Siemens ga je začel izdelovati leta 1976.

The digital electronic switching system, which is one of the most widely-used technologies in telephone exchanges all over the world and the first alternative to analogue phone services, represented a small revolution in the field of telephone. Siemens began manufacturing this system in 1976.



Leta 1984 je Siemens predstavil sistem Hicom: tehnologija je bila skladna s standardom ISDN in je v eni telefonski liniji pod eno telefonsko številko in v enem omrežju združevala različne komunikacijske module.

In 1984, Siemens presented its Hicom system: this technology was made in accordance with the ISDN standard and it merged different communication modules into a single phone line, under one phone number and in one network.

V devetdesetih letih se je Siemens podal tudi v razvoj mobilne tehnologije, ki pa ga je kasneje opustil. Nekatere izmed rešitev v uporabnosti Siemensovih mobilnih telefonov so bile novosti – mobilnik S10 iz leta 1997 je imel barvni zaslon za tisti čas visoke ločljivosti in gumb, ki je uporabniku omogočal dvajsetsekundno funkcijo diktafona.

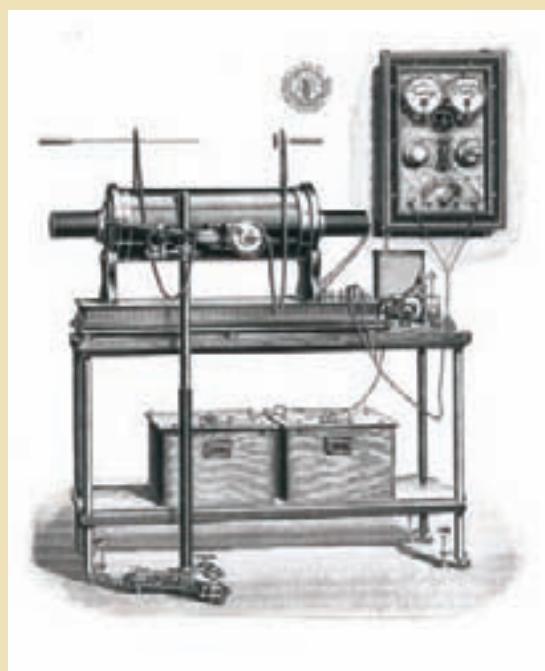


In the nineties, Siemens became involved in the development of mobile technology, which it later abandoned. Some of the usability solutions in Siemens mobile phones were new features – the S10 mobile phone from 1997 had a colour screen (with high-resolution for that time) and a button with a twenty second voice recording function.

Inovacije v medicinski tehnologiji

Innovations in Medical Technology

SIEMENS - ZGODBA O PREVODNOSTI
MOČ NAPREDKA V EVROPI IN NA SLOVENSKEM
SIEMENS - A STORY OF CONDUCTIVITY
THE POWER OF PROGRESS IN EUROPE AND IN SLOVENIA



Rentgenska enota RGS, 1896.
The RGS X-ray unit, 1896.

Od konca 19. stoletja so se Siemensovi razvojnik posvečali tudi razvoju diagnostičnih naprav in medicinskih pripomočkov.

Vrteče se rentgenske anodne cevi, ki jih je Siemens predstavil leta 1933, so lahko zdržale bistveno višje obremenitve kot klasični rentgeni. Krogla je bila priključena neposredno na osvetljevalni tokokrog in je bila po vsem svetu v uporabi vse do osemdesetih let prejšnjega stoletja.

From the late 19th century onwards, Siemens' developers devoted a great deal of time and effort to the development of diagnostic tools and medical devices.

The rotating X-ray anode tubes that were presented by Siemens in 1933 could withstand much greater loads than their conventional counterparts. The X-ray sphere could be connected directly to the lighting circuit and was used all over the world up until the nineteen eighties.



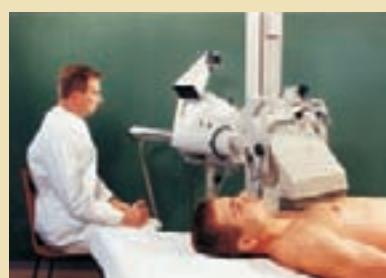
Elektrokardiograf, 1911.
The electrocardiograph, 1911.



Fonofor (slušni aparat) v damski torbici, 1913.
The Phonophor hearing aid in a ladies bag, 1913.



Sistem za magnetno resonanco celega telesa
Magnetom, 1983.
Magnetom (1983) – A whole body MRI system (Magnetic Resonance Imaging).



Ultrazvočna diagnostična naprava Vidoson, 1965.
The VIDOSON ultrasound diagnostic device, 1965.



Srčni spodbujevalnik, 1958.
A cardiac pacemaker, 1958.



Programska oprema za obdelavo podatkov različnih diagnostičnih naprav Syngo, 1999.
Syngo (1999) – Data processing software used to analyse data collected by various diagnostic devices.



Slušni aparat je bil le eden od Siemensovih proizvodov, ki so v prvi polovici 20. stoletja lajšali zdravstvene težave. Reklame za »fonofor« v Slovenskem narodu, 1929 in 1930.
Slovenian advertisements for the Phonophor hearing aid (1929 and 1930). Hearing aids were just one of Siemens' products manufactured during the first half of the 20th century that alleviated health problems.

Pridobivanje Electricity električne Generation energije

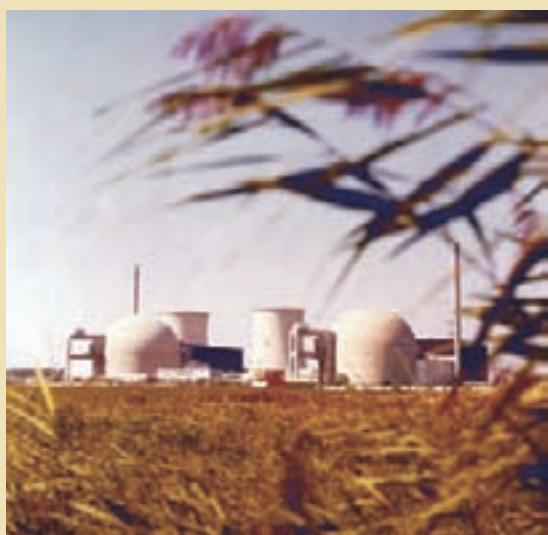
SIEMENS - ZGODBA
O PREVODNOSTI
MOČ NAPREDKA V EVROPI
IN NA SLOVENSKEM
SIEMENS - A STORY
OF CONDUCTIVITY
THE POWER OF PROGRESS
IN EUROPE AND IN SLOVENIA

Največji projekti Siemensa na področju energetike: Siemens' largest projects in the field of energy:



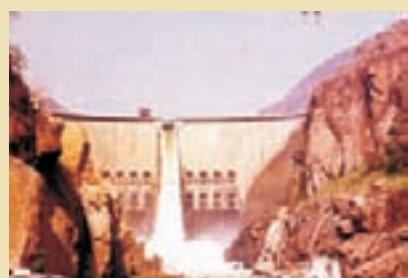
Gradnja hidroelektrarne na reki Shannon, 1928.

The construction of a hydroelectric power plant on the Shannon River, 1928.



Blok A jedrske elektrarne Biblis, Nemčija, 1974.

The Biblis Nuclear Power Plant - Unit A, Germany, 1974.



Hidroelektrarna Cabora Bassa, Moçambik, 1975.

The Cabora Bassa Hydroelectric Power Plant, Mozambique, 1975.



Plinska turbina v elektrarni Irsching je svetovna rekorderka v učinkovitosti izrabe plina – v elektriko ga pretvori z izkoristkom 60,75 odstotka.

The Irsching Power Plant set a new world record in power plant efficiency with its SGT5-8000H gas turbine. The plant can convert natural gas into electricity at an efficiency of 60.75%.

Poleg najzgodnejših strojev in napeljav – bodisi iz zasebne bodisi lokalne pobude – ki jih je Siemens na Slovenskem nameščal v elektrarne na prelomu 19. in 20. stoletja, je bila prisotnost te družbe v slovenskem sistemu oskrbovanja z električno energijo močna tudi v celotnem 20. stoletju in je še danes.

In addition to all the earliest machines and installations that Siemens installed into power plants in Slovenia at the turn of the 19th to the 20th century, whether by private or local initiative, this company's presence in the Slovenian electricity supply system remained strong throughout the entire 20th century and up until the present day.

Leta 1925 je na področju takratne Slovenije obstajalo 22 elektrarn, opremljenih s Siemensovo tehnologijo. Tudi ta podatek potrjuje takratno tehnično naprednost Slovenije, še zlasti v primerjavi z ostalimi deli Jugoslavije. V obdobju dvajsetih let prejšnjega stoletja je bilo na območju Jugoslavije 250 objektov za proizvodnjo elektrike, od tega jih je 55 opremil Siemens, skoraj polovica jih je delovala v Sloveniji.

In 1925, there were 22 power plants stations in the area of Slovenia - all equipped with Siemens technology. This piece of data confirms that, back then, Slovenia was already quite advanced in terms of technology, especially in comparison to the other parts of the former Yugoslavia. During the 1920s, 250 facilities for the generation of electricity were set up in the territory of the former Yugoslavia; 55 of them were equipped by Siemens and nearly half of them were operating in Slovenia.

Zniževanje izpustov ogljikovega dioksida in uporaba obnovljivih virov sta eden od odgovorov Siemensa na omejeno razpoložljivost fosilnih virov energije in naraščajoče potrebe po električni.

One of Siemens' solutions to the limited availability of fossil fuels and the growing need for electricity is to reduce carbon dioxide emissions and use renewable energy sources.



Siemensova tehnologija sodeluje pri proizvodnji približno 50 odstotkov vse elektrike, ki nastane v Sloveniji. Plinski turbini v bloku 5 TEŠ pomembno prispevata k zmanjševanju škodljivih izpustov. V slovenskem prenosnem omrežju deluje tudi prečni transformator, ki regulira pretoke energije med Slovenijo in Italijo – gre za enega največjih te vrste na svetu.

Siemens' technologies are used in the production of approx. 50 per cent of all electricity generated in Slovenia. The gas turbines in Unit 5 of the Šoštanj Thermal Power Plant significantly reduce harmful emissions. The Slovenian transmission network also has a cross transformer which regulates power flows between Slovenia and Italy, and is one of the largest of its kind in the world.



Železniški Rail transport Transport

SIEMENS - ZGODBA
O PREVODNOSTI
MOČ NAPREDKA V EVROPI
IN NA SLOVENSKEM
SIEMENS - A STORY
OF CONDUCTIVITY
THE POWER OF PROGRESS
IN EUROPE AND IN SLOVENIA



Lokomotiva E 44, 1930.
E 44 locomotive.

Edino področje transportnih sredstev, kjer je v stoletju in pol močno dominirala električna energija, je železniški transport. V zadnjem stoletju je Siemens izdelal več različnih tipov električnih lokomotiv kot katerakoli druga družba.

Rail transport is the only means of transport to be strongly dominated by electricity for a century and a half. In the last century, Siemens developed more types of electric locomotives than any other company.



Lokomotiva EuroSprinter, 1993.
EuroSprinter locomotive.



Viseča železnica v Dortmundu, 1984.
The elevated railway in Dortmund.



Siemens Velaro, 2006.

Siemensov hitri vlak Velaro doseže hitrost 330 kilometrov na uro, razdaljo med Barcelono in Madridom premaga v poltretji ur, na razdalji 100 kilometrov pa porabi le 0,33 l goriva na potnika.

The Siemens Velaro high-speed train can reach a speed of 330 kilometres per hour. It can get from Barcelona and Madrid in just two and half hours and, over a distance of 100 kilometres, it consumes only 0.33 litres of fuel per passenger.



Slovenske železnice so svoj vozni park leta 2002 obnovile s Siemensovimi lokomotivami in regionalnimi potniškimi vlaki tipa Desiro. Med letoma 2006 in 2008 je Siemens dobavil Slovenskim železnicam 32 lokomotiv EuroSprinter.

In 2002, the Slovenian Railways updated its railroad park with Siemens locomotives and regional passenger trains with Desiro type trains. Between 2006 and 2008 Siemens supplied to Slovenian Railways 32 EuroSprinter locomotives.