

Selected landmarks in

The History of Electricity Generation | Distribution | Utilisation

A contribution to the Institution's 150th anniversary celebrations in 2021
from the IET History of Technology Network

This is one of a series of timelines which focus on a selection of engineering and technology landmarks which have occurred during the lifetime of the Institution since its foundation in 1871.

Comments regarding any errors in, or significant additions to, this timeline should be sent to the History of Technology Network Manager Anne Locker by Email to alocker@theiet.org

Date	Event
	For a selection of events in this sector prior to 1871 see footnote
1871	IET FOUNDED AS SOCIETY OF TELEGRAPH ENGINEERS
1871	Souter Lighthouse became the first to be specifically designed and built to use electricity.
1875	Fyodor Pirotsky invented and tested the world's first electric tram line which operated in Sestroretsk near St Petersburg, Russia.
1876	Paul Jablochhoff developed his electric candle. This was commercially viable and superior to previous arc lights. It was one of the first to be used in large quantities
1878	May 30th: The first electric street lights using the Jablochhoff candle were installed on the Avenue De l'Opera and the Place d'Etoile in Paris.
1879	The Liverpool (Corporation) Electric Lighting Act was the first electric lighting act to be enacted in the UK. It gave the Liverpool Corporation powers to light streets by electricity.
	February 3rd: Joseph Swan gave a successful demonstration of his carbon filament bulb to an audience of several hundred people at Newcastle's Literary and Philosophic Society. It went on to be a practical commercial success.

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Date	Event
	1880 - 1889
1881	World's first commercially successful electric tramway, the Gross-Lichterfelde tramway in Lichterfelde near Berlin in Germany was built by Werner von Siemens who contacted Pirotsky (see above). It initially drew current from the rails, with overhead wires being installed in 1883.
	<p>Godalming, a historic market town, civil parish and administrative centre of the Borough of Waverley in Surrey, had installed electric street lighting and electricity in people's houses. It was not the first town to have electric streetlights, but it was the first in the world to provide a public electricity supply.</p> <p>A contract had been made between the Town Council and R & J Pullman who owned a tannery that in compensation for the use of their water rights, they would be given lights for the tannery's yards, factory buildings and Mr J Pullman's house. The system fed seven arc lights (three in the town) and 40 Swan incandescent lights which burnt in the minor streets].</p> <p>[Power was generated at Westbrook Mill, a tannery situated on the river Wey and owned by R & J Pullman. Water on a river side channel turned two Poncelet waterwheels which were coupled to a Siemens alternator and dynamo. Following initial problems with floodwater and backwater which affected water flow, a 10 hp steam engine was brought into use].</p>
	April: What is likely the first human-carrying electric vehicle with its own power source was successfully tested along Rue Valois a Paris street by French inventor Gustave Trouvé. He was unable to patent it though.
1882	The Electric Lighting Act was the first public measure to facilitate and regulate the early electricity industry in the UK. It enabled the Board of Trade to authorise the setting up of supply systems by persons, companies or local authorities. Local authorities had the right to take over the assets of companies in their area after 21 years which discouraged enterprise. (This was extended to 42 years by the Electric Lighting Act 1888).
	<p>Jan12: Holborn Viaduct power station, named the Edison Electric Light Station, was the world's first coal-fired power station generating electricity for public use. It was built at number 57 Holborn Viaduct in central London, by Thomas Edison's <u>Edison Electric Light Company</u>.</p> <p>The plant began running three years after the invention of the carbon-filament incandescent light bulb. It drove a 93 kW generator which produced DC at 110 volts.</p> <p>Edison opened a second coal-fired power station in September 1882 in the United States, at Pearl Street Station in New York City</p>
	<p>The IEE issue "Rules and Regulations for the Prevention of Fire Risks Arising from Electric Lighting" thereafter known as The Wiring Regulations.</p> <p>These regulations have been regularly updated. The current version is "Requirements for Electrical Installations" 18th Edition BS7671:2018.</p>

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Date	Event
1884	Charles Algernon Parsons designed the first steam turbine and continued its development. This was to become the mainstay of electricity generation
	Thomas Parker built a practical production electric car in Wolverhampton using his own specially designed high-capacity rechargeable batteries.
	September/October: Three Hungarian engineers - Karoly Zipernowsky, Otto Blathy and Miksa Deri developed the first 1ph transformer having a closed magnetic core.
1889	The first 3ph transformer was developed by Mikhail Dolivo-Dobrovolsky a Russian engineer.
	1890-1899
1891	Nikola Tesla invented the Tesla coil, an air-cored, dual-tuned resonant transformer for producing very high voltages at high frequency.
	1900 -1909
1901	June 18th: The opening of Neptune Bank Power Station. The first station in the world to supply 3ph AC for industrial purposes rather than just lighting.
	1910 -1919
1919	<p>The Electricity (Supply) Act 1919 which came into force in December, created joint electricity authorities with the agreement of the statutory undertakers concerned. Each of the new authorities would acquire all the power stations in their area, undertake rationalisation and build new ones on a larger, more economically efficient scale.</p> <p>[In 1915 the government set up the Electric Power Supply Committee to review the many private companies and individuals that had set up/were setting up their own power supply. There were over 600 separate electricity undertakers in operation across the country, most of which were too small to be economical. Their average generating capacity being under 5MW. The committee recommended the appointment of electricity commissioners that would divide the country into district boards. These would take over power generation and distribution in their area. The commissioners had to give their consent to new power station schemes].</p>
	1920 -1929

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Date	Event
1926	The Electricity (Supply) Act 1926 came into force. Under the Act the Central Electricity Board (CEB) was established and charged with providing 'main transmission line' interconnections between selected stations and undertakings; and to standardise the frequency of generation; and other purposes. The provisions of the Act enabled the construction of the National Grid network running at 132kV 50Hz.
1930 -1939	
1932	<p>Production of "Pyrotenax" mineral insulated cable began at La Societe Alsacienne des Constructions Mecaniques (SACM) based at Clichy on the outskirts of Paris. The process was based on the patents that had been filed in Switzerland by Dr Francois Borel and Edouard Berthoud in 1878.</p> <p>It is interesting to note that because of fire risk, artificial lighting was not permitted in the Louvre before mineral insulated cable became available.</p> <p>In 1936 due to a perceived commercial future of the product in the UK, a manufacturing company, Pyrotenax Limited, was set up. It was located at Hebburn in the North East of England. [R.M. Black. 1983: The History of Electric Wires and Cables].</p>
1935	The UK's National Grid is born. Commercial operation of the national 132kV electric power transmission grid begins in the UK. It is the first integrated national grid in the world.
1938	Vitaly Grosse (AEG) filed the first patent for the use of SF6 as an interrupting medium
1940 -1949	
1947	The Electricity Act 1947 comes into force which nationalises the electricity supply industry, as much on the basis of social objectives for electrification for all as on potential economies. The UK Electricity Supply Industry is dominated by one large generating and transmission company, the Central Electricity Generating Board (CEGB), which sells electricity in bulk to 12 area distribution boards, each of which was obliged to serve a closed supply area or franchise.
1950 -1959	
1950	The existing electricity network can't meet consumers' future demand. Work starts on a new 12-year project to create a 275kV supergrid – with new lines capable of carrying 400kV in the future.

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Date	Event
1954	June 27th: The Obninsk Nuclear Power Plant in Russia was the first in the world to generate electricity for a power grid.
1956	October 17th: Calder Hall, the world's first full-scale power station devoted solely to electricity production, opened. [On September 3rd, 1948 the X-10 Graphite reactor based in Oakridge Tennessee generated electricity for the first time though this was not a commercial operation].
	1960 -1969
1961	June: The first Cross Channel 200kV DC link (+100kV / -100kV) between England and France was successfully inspected, tested and commissioned. The link consisted of two oil impregnated paper insulated cables of conventional design that were laid simultaneously alongside each other. One pair were laid out of Britain the other pair were laid out of France. Cable jointing was carried out mid Channel.
1966	The world's first superconducting electric motor, made by NEI International Research and Development Co. Ltd. for the Ministry of Defence (Navy), a homopolar machine containing no iron and rated at 50 hp.
	1970 -1979
	1980 -1989
1989	July: The Electricity Act 1989 allowed for the privatisation of the electricity supply industries in the UK. The Central Electricity Generating Board was eventually split into four separate companies – National Power; PowerGen; Nuclear Electric and the National Grid,
	1990 -1999
	2000 -2009
2001	The Central Electricity Generating Board is finally wound up under The Central Electricity Generating Board (Dissolution) Order. As is the Electricity Council under the Electricity Council (Dissolution) Order 2001.
2008	The Energy Act 2008 established the Renewables Obligation to support generating electricity from renewable sources. The Act also made provisions for the decommissioning and clean-up of nuclear sites and the provision of smart meters.
	2009 -2019

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Date	Event
2011	BritNed the 450 kV DC submarine inter-connector cable between the Isle of Grain, Kent, and the Netherlands (Maasvlakte, Rotterdam) is commissioned. It is 260 km long and has a capacity of 1,000 MW.
2012	The ±200 kV DC East-West Interconnector submarine and underground power cable between Pentir, North Wales and Arklow, County Wicklow is commissioned. It is 261 km long and has a capacity of 500 MW.
2019	<p>January 31st: The 400 kV DC Nemo Link between Richborough, Kent and Zeebrugge in Belgium goes live. It is 140 km long and has a capacity of 1,000 MW.</p> <p>[Nemo Link is a joint venture between National Grid and Belgian transmission system operator Elia. It is the first of four interconnector projects being developed under the cap and floor regulation, collectively representing a total investment by National Grid of £2.1 billion. A 1,000 MW, IFA2 project to France and a 1,400 MW North Sea Link to Norway are both under construction and expected to be operational in 2020 and 2021 respectively. In November 2019, the National Grid Board gave financial approval for the construction of the 1,400 MW Viking Link, which will connect the UK with Denmark].</p>
2019:	Sees the UK reach an historic electricity milestone with more electricity generated from renewable sources than fossil fuels.

Footnote.

Between 2012 and 2020 the following power stations stopped generating electricity:

- Kingsnorth (Kent) 2000 MW; Coal / Oil – December 17th, 2012.
- Didcot (Oxfordshire) 2000 MW; Coal / Gas – March 22nd 2013.
- Fawley (Hampshire) 2000 MW; [1000 MW 1995 onwards] Oil – March 31st 2013.
- Ironbridge B (Shropshire) 1000 MW; Coal – November 20th 2015.
- Ferrybridge C (West Yorkshire) 2000 MW; Coal – March 23rd 2016.
- Rugeley B (Staffordshire) 1000 MW; Coal – June 6th 2016
- Eggborough (North Yorkshire) 1960 MW; Coal / Biomass – March 23rd 2018
- Cottam (Nottinghamshire) 2000 MW; Coal – September 23rd 2019
- Fiddlers Ferry (Cheshire) 2000 MW; Coal – March 31st 2020

Prior to the formation of the Society of Telegraph Engineers in 1871, The world's first arc light is demonstrated by Humphrey Davy. In 1831 The principal of electromagnetic induction was discovered by Faraday. 1838/9 Welsh justice and physician Sir William Robert Grove developed an improved wet cell battery using oxygen and hydrogen gas. He named the [experimental] device a "gas battery" – the first fuel cell. As further understanding of the chemistry grew, more research took place in the ensuing years. However, the importance of

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its potential applications were largely overlooked. The technology was not really exploited until the late 1950's and early 1960's when NASA began incorporating the technology into their space programmes. 1866 September 8th: Successful completion of laying the second Atlantic submarine telegraph cable. (The first having been repaired at the same time).

For further information see: -

- [\[http://www.esru.strath.ac.uk/EandE/Web_sites/03-04/hydrogen/history.htm\]](http://www.esru.strath.ac.uk/EandE/Web_sites/03-04/hydrogen/history.htm)
- [R.M. Black. 1983: The History of Electric Wires and Cables].
- [collection.sciencemuseumgroup.org.uk]
- <https://www.nationalgrid.com/stories/grid-at-work/nemo-link-open-business>
- Parsons, R. H. (2015), The Early Days of the Power Station Industry, Cambridge University Press, [ISBN 9781107475045](#)