Electricity fonafote

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Electricity generation is the process of generating electric power from sources of primary energy. For utilities in the electric power industry, it is the stage prior to its delivery (transmission, distribution, etc.) to end users or its storage, using for example, the pumped-storage method.

The fundamental principles of electricity generation were discovered in the 1820s and early 1830s by British scientist Michael Faraday. His method, still used today, is for electricity to be generated by the movement of a loop of wire, or Faraday disc, between the poles of a magnet. Central power stations became economically practical with the development of alternating current (AC) power transmission, using power transformers to transmit power at high voltage and with low loss.

Commercial electricity production started with the coupling of the dynamo to the hydraulic turbine. The mechanical production of electric power began the Second Industrial Revolution and made possible several inventions using electricity, with the major contributors being Thomas Alva Edison and Nikola Tesla. Previously the only way to produce electricity was by chemical reactions or using battery cells, and the only practical use of electricity was for the telegraph.

Electricity generation at central power stations started in 1882, when a steam engine driving a dynamo at Pearl Street Station produced a DC current that powered public lighting on Pearl Street, New York. The new technology was quickly adopted by many cities around the world, which adapted their gas-fueled street lights to electric power. Soon after electric lights would be used in public buildings, in businesses, and to power public transport, such as trams and trains.

The first power plants used water power or coal.[7] Today a variety of energy sources are used, such as coal, nuclear, natural gas, hydroelectric, wind, and oil, as well as solar energy, tidal power, and geothermal sources.

Several fundamental methods exist to convert other forms of energy into electrical energy. Utility-scale generation is achieved by rotating electric generators or by photovoltaic systems. A small proportion of electric power distributed by utilities is provided by batteries. Other forms of electricity generation used in niche applications include the triboelectric effect, the piezoelectric effect, the thermoelectric effect, and betavoltaics.

Electric generators transform kinetic energy into electricity. This is the most used form for generating electricity based on Faraday"s law. It can be seen experimentally by rotating a magnet within closed loops of conducting material, e.g. copper wire. Almost all commercial electrical generation uses electromagnetic induction, in which mechanical energy forces a generator to rotate.

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Until recently, photovoltaics were most commonly used in remote sites where there is no access to a commercial power grid, or as a supplemental electricity source for individual homes and businesses. Recent advances in manufacturing efficiency and photovoltaic technology, combined with subsidies driven by environmental concerns, have dramatically accelerated the deployment of solar panels. Installed capacity is growing by around 20% per year[2] led by increases in Germany, Japan, United States, China, and India.

The selection of electricity production modes and their economic viability varies in accordance with demand and region. The economics vary considerably around the world, resulting in widespread residential selling prices. Hydroelectric plants, nuclear power plants, thermal power plants and renewable sources have their own pros and cons, and selection is based upon the local power requirement and the fluctuations in demand.

All power grids have varying loads on them. The daily minimum[citation needed] is the base load, often supplied by plants which run continuously. Nuclear, coal, oil, gas and some hydro plants can supply base load. If well construction costs for natural gas are below $10 per MWh, generating electricity from natural gas is cheaper than generating power by burning coal.[13]

Nuclear power plants can produce a huge amount of power from a single unit. However, nuclear disasters have raised concerns over the safety of nuclear power, and the capital cost of nuclear plants is very high.Hydroelectric power plants are located in areas where the potential energy from falling water can be harnessed for moving turbines and the generation of power. It may not be an economically viable single source of production where the ability to store the flow of water is limited and the load varies too much during the annual production cycle.

Electric generators were known in simple forms from the discovery of electromagnetic induction in the 1830s. In general, some form of prime mover such as an engine or the turbines described above, drives a rotating magnetic field past stationary coils of wire thereby turning mechanical energy into electricity.[14] The only commercial scale forms of electricity production that do not employ a generator are photovoltaic solar and fuel cells.