

how do Electric Generation Stations operate?

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Electric generation stations refer to those sites where electricity is produced or generated by a variety of different strategies and from different sources. There is a wide list of sources from which electricity is produced at different generation station facilities. Regardless of the source, electricity or electric current is produced using a magnetic field. Rotating the magnetic field to produce a particular amount of electric current is important. In addition to that, the production, direction, and magnitude of electric current greatly depend on positive and negative poles of the magnetic field as well. All of this can be easily remembered by considering the point that an electric or magnetic field can be produced by the rotation of either one ("Powering a Generation: Generating Electricity," 2018).

The next significant thing to remember is that generating stations operate within a specific range of electrical voltages. This range is between 13,800 and 24,000 volts. The major thing that affects the voltage range is transmission distance. The voltage range is also increased when it is intended to produce electric current and transmit it to major or long distances. However, certain attention is being given to the sources of electrical generation and their after-effects on the nearby environment. Some of the commonly used electrical generation sources are non-renewable as well as produces large amounts of pollutants. These pollutants, whether air, water, or soil, are playing havoc with the surrounding environment ("SRP: Power Generating Stations," 2018).

Because electricity is produced on a large scale, the sources used are also utilized in large amounts. However, it is understood that residual products are left at the end of every production process. Same in the case of electric production, the sources used like water are polluted or contaminated during the process (in the sense as they do not remain suitable for regular or common use). This water, at the end of the production process of electric current, is sent out of the generation facility. As it has turned non-usable and pollutants (containing different chemicals and substances), it increases the pollution and danger to the surrounding environment.

For example, most of the water used in generation facilities (both electric and other) is thrown out of the boundaries without pondering over its mixing with the regular, normal, and clear water present in the rivers or lakes. So it mixes with the clean water and causes damage according to the impurities it contains and its amount. There are many sources for electric generation, including hydroelectric, steam, distributed generation, wind, and a turbine or combusted engine ("Generating Electricity From Coal," 2018).



Apart from the sources, there are different methods of generating electricity. The major and commonly used methods include utilizing the piezoelectric effect, triboelectric effect, and nuclear decay capture. In addition to that, niche applications utilize betavoltaics. This method involves

directly converting heat into electricity through the thermoelectric effect. Different kinds of generators are placed within the generation facility that produces electric current either by rotation or photovoltaic systems.

The electric generators' mechanisms include transforming kinetic energy into electrical energy. The important thing to remember is that all the generators and mechanisms involve the transformation or conversion of one form of energy into the required form of energy (electrical). The mechanism is conducted by rotating a magnet within closed loops of wire. The wire is essentially made up of any good conducting material like copper. This process is called electromagnetic induction and is used in almost all electrical generation facilities on a commercial level (Harvey et al., 2017).

In the electromagnetic induction method, the generators are started by using mechanical energy. This mechanical energy is converted into kinetic energy, and then this active form of energy is converted into electric current. The second method of electric current production includes converting chemical energy into electricity. It is the same as it happens in electrical batteries. This kind of conversion of one form of energy into other for the basic purpose of electricity production is important in mobile and portable applications. This is because such a conversion does not need abundant backup supplies and can be moved easily from one place to another place.

There are two kinds of cells in electrical batteries: primary and secondary. The primary cells work directly as the power source, like zinc-carbon batteries. On the other hand, secondary cells are used as storage systems unlike the use of primary cells. Through this function, there are open and closed electrochemical systems. The open electrochemical system is also referred to as fuel cells. The fuel cells comprise the ability to extract power either from the synthesized fuels or even from the natural fuels as well. It is mainly used to extract power from the fuel regardless of the fuel's origin and nature.

One of the possibilities of electricity production is the utilization of osmotic power. But this possibility can only be availed at places where fresh water and salt are present and where they can be merged. The photovoltaic effect is the next significant method used to produce electric current. This effect involves transforming or converting light energy into the electrical form of energy (as the name describes itself). It is the same process that is conducted in the solar cells. These panels or cells can convert light energy into electrical energy directly. The apparent advantage of using this effect is that solar energy (the source in this case) is readily and easily available in an abundant amount. However, the reason for not using the photovoltaic effect is the high price of the solar panels.

Progress has been made in this area to solve this problem. Now, silicon solar cells are commercially available that have very decreased cost, but along with that, they also have marked decreased functional ability as well. The silicon-made solar cells are only capable of 30% conversion of solar energy or light into electric current. Now, owing to the photovoltaic effect, solar cells or photovoltaic systems are used in remote sites that cannot access or connect to the commercial power grid system.

Though the price of solar cells is very high, other devices like silicon-made solar cells are now used,

and they have largely replaced the grid or electrochemical systems in remote areas. In addition to that, considering the big advantage of the availability of light as a source, commercial sites are now also using these cells or panels. Though the basic purpose is the production of electric current or electricity, other needs like the lesser use of sources, minor disadvantages to the neighborhood and surrounding environment, and plenty of availability of required sources are also important. Considering all these factors and important underlying points, the sources and methods of electrical production are utilized in any electrical generation facility.

Works Cited

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