



Canada is blessed with significant quantities of freshwater. Canadian water resources play a major role in the economy and are integral to the country's agriculture, manufacturing, navigation and tourism sectors. Another important use of water is power generation through hydroelectricity. Hydroelectricity refers to the generation of electrical power from falling water. Water is channelled from a high point to a low discharge point where it spins large turbines that are connected to generators, thus producing electrical power that is transmitted through power lines.

There are two main types of hydroelectric dams. Some dams are located along steep rivers with large flows that pass through the turbines. These are referred to as "run of the river" type dams. The other type is the classical dam structure that stores water behind it to a high level and channels water to the bottom where turbines are located. In both types, the principle is the same: the potential energy stored in the water at high elevation is converted into mechanical energy, which turns the turbines and generators to produce electrical energy.

Canada is the second largest producer of hydroelectric power in the world after China, producing over 10% of the total hydroelectric power output of the world. The history of utilizing the energy of water in Canada dates back to the 1850s when running water was used to turn mechanical machinery in sawmills. Hydroelectricity was introduced in the 1880s when electric generators were developed. By the early 1900s rapid development of hydroelectric power stations took place in Canada, particularly in Niagara Falls, Ontario and Shawinigan, Quebec.

In the first half of the twentieth century, hydroelectricity accounted for over 90% of Canada's total electric power production. So much so that people still use the term "hydro" to refer to electrical power, although by definition "hydro" means water.

In addition to producing hydroelectric power, dams also serve to protect against flooding and control the rate of flow of rivers. Compared to coal fired power plants, hydroelectricity does not produce direct greenhouse gas emissions. Besides, hydroelectricity is a renewable energy source as water is naturally recycled through precipitation.

After the 1970s, the development of new hydro projects slowed due to the significant environmental and social costs associated with the construction of dams. Construction of dams leads to flooding of large areas of lands upstream. In addition, dams act as a large artificial barrier to fish that navigate upstream to spawning grounds.

Nonetheless, hydroelectricity remains one of the main sources of renewable energy that utilizes the natural power of water. Water is not merely a liquid that is consumed by living organisms. Water plays a major role in the Canadian economy and overall quality of life, and we need to use water sustainably and preserve this precious resource for future generations.