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The electrical power grid that powers Northern America is not a single grid, but is instead divided into multiple wide area synchronous grids.[1] The Eastern Interconnection and the Western Interconnection are the largest. Three other regions include the Texas Interconnection, the Quebec Interconnection, and the Alaska Interconnection. Each region delivers power at a nominal 60 Hz frequency.[2]

The regions are not usually directly connected or synchronized to each other, but there exist some HVDC interconnectors. The Eastern and Western grids are connected via seven links that allow 1.32 GW to flow between them. A study by the National Renewable Energy Laboratory found that increasing these interconnections would save energy costs.[2]

In the United States in the 1920s, utilities formed joint operations to share peak load coverage and backup power. In 1934, with the passage of the Public Utility Holding Company Act, electric utilities were recognized as public goods of importance and were given outlined restrictions and regulatory oversight of their operations.

From 1967, the East and West interconnections were directly connected together. The AC ties did not have high capacity and were subject to oscillations, and so their connection proved unreliable. In 1975 the AC ties were disconnected, because DC ties were found to work more reliably.[1]

There are two major wide area synchronous grids in North America: the Eastern Interconnection and the Western Interconnection. There are three minor power grids in North America: the Alaska Interconnection, the Texas Interconnection, and the Quebec Interconnection. The Eastern, Western and Texas Interconnections are tied together at various points with DC interconnects allowing electrical power to be transmitted throughout the contiguous U.S., Canada and parts of Mexico.

The transmission grids are operated by transmission system operators (TSOs), not-for profit companies that are typically owned by the utilities in their respective service areas, where they coordinate, control and monitor the operation of the electrical power system. TSOs are obliged to provide nondiscriminatory transmission access to electricity generators and customers. TSOs can be of two types: Independent System Operators (ISOs) and Regional Transmission Organizations (RTOs). ISOs operate within a single state. RTOs cover wider areas, crossing state borders.[citation needed]

In 2009 there were four RTOs in the U.S.:[citation needed]

RTOs are similar but not identical to the nine Regional Reliability Councils associated in the North American Electric Reliability Corporation (NERC), a nonprofit entity that is in charge of improving the reliability and

security of the bulk power system in the U.S., Canada and the northern part of Baja California in Mexico. The members of the Regional Reliability Councils include private, public and cooperative utilities, power marketers and final customers.

The Regional Reliability Councils are:

The FERC distinguishes between 10 power markets in the U.S., including the seven for which RTOs have been established, as well as:

ISOs and RTOs were established in the 1990s, when states and regions established wholesale competition for electricity.

The North American Electric Reliability Corporation (NERC) is a nonprofit corporation based in Atlanta, Georgia, and formed on March 28, 2006, as the successor to the National Electric Reliability Council (also known as NERC), which formed in the wake of the first large-scale blackout in November of 1965. The original NERC was formed on June 1, 1968, by the electric utility industry to promote the reliability and adequacy of bulk power transmission in the electric utility systems of North America. NERC"s mission is to "ensure the reliability of the North American bulk power system."[7]