Serving the Bakken

The oil play in the Bakken formation covers parts of western North Dakota and eastern Montana. Crude oil production in the North Dakota has quadrupled since 2007. In February 2013, state production topped 778,000 barrels a day, representing about 11 percent of the nation's production. In March 2012, North Dakota surpassed Alaska as the second-largest oil-producing state, trailing only Texas.

As a result of the drilling and production activity, electrical loads are growing rapidly. Basin Electric member cooperatives serve much of that load. In 2009 Basin Electric and its member systems planned for 400 megawatts of load to develop in this area. Basin Electric is now planning for loads to grow an additional 1,000 megawatts by 2025.

Basin Electric has been actively monitoring the growth and planning for transmission and generation needs associated with rapidly increasing loads.

Transmission

Basin Electric, its member cooperatives, and the Western Area Power Administration have developed a phased approach with transmission infrastructure.

Western Area Power Administration and Basin Electric are partners in the Integrated System, a joint transmission system in the region. Together, they have spent hundreds of millions of dollars in new construction and upgrades identified in earlier load forecasts. Recent projects:

- Basin Electric's 74-mile Rhame-to-Belfield 230-kilovolt (kV) transmission line and the associated Rhame Substation in 2010
- Basin Electric's 61-mile Williston-to-Tioga 230-kV transmission line and the associated Neset Substation in 2011
- Western's upgrade of their 75-mile Williston-to-Charlie Creek 115-kV line to 230 kV in 2012

**Source of oil production statistics: EIA.gov and dmr.nd.gov.*

With these projects in place, the Integrated System will have both a 115- and a 230-kV loop around Lake Sakakawea, increasing the system's reliability and load-serving capability.

However, forecasts indicate loads trending upward at an increased rate, requiring further additions. In December 2011 Basin Electric announced plans to build a 190-mile 345-kV transmission line from its Antelope Valley Station north of Beulah, around the western edge of Lake Sakakawea into the Tioga area. Construction is planned to start in 2014 with the line being in service by 2016. The project includes construction of two new substations.

In addition to the projects directly related to the 345-kV line, many others are planned, under construction or have been completed to enhance system reliability, including new substations, upgrades to existing substations and a new transformer at the Leland Olds Station switchyard. Member cooperatives have also added substations and made improvements to the transmission and distribution system.

Generation

To meet the need for additional generation, Basin Electric has constructed additional power plants outside North Dakota to free up generation capacity within the state:

- Culbertson Generation Station, Culbertson, MT
  - 90-megawatt natural gas-fired peaking plant (2011)
- Dry Fork Station, Gillette, WY
  - 385-megawatt coal-based plant (2011)
- Deer Creek Station, Elkton, SD
  - 300-megawatt natural gas-fired combined cycle intermediate plant (2012)

Culbertson Generation Station in Montana

Basin Electric is also planning to add approximately 300 megawatts of new generation in the Bakken region by 2015. The generating units would be close to the Bakken load to quickly support the voltage on the system.

The Pioneer Generation Station, a natural gas-fired power plant, is planned northwest of Williston. Three 45-megawatt units are planned for the site. The first unit will be equipped with a synchronous clutch that allows the turbine to uncouple from the generator, allowing the generator to provide fast-acting reactive power on the transmission system. The facility's three units are planned for completion in 2013, 2014 and 2015.

A similar facility, the Lonesome Creek Station, is planned for the Watford City area south of Williston. Its three units are also planned for completion in 2013, 2014 and 2015. Both Lonesome Creek and Pioneer generation stations will serve as peaking power plants once the planned transmission projects are energized.

Basin Electric also has a contingency plan to bring in additional generation from outside the area via transmission paths, either from generation stations in Wyoming or through purchases from power markets, if loads develop faster than anticipated.