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POWER
FORECAST 2012

WILLISTON BASIN
OIL AND GAS RELATED
ELECTRICAL LOAD GROWTH FORECAST

KLJ

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1. Executive Summary

The North Dakota Transmission Authority (NDTA) commissioned KLJ, an employee-owned, engineering, surveying and planning firm, to complete the Williston Basin Oil and Gas Related Electrical Load Growth Forecast (PF 12) and project future electrical load growth in the Williston Basin area.

The results of this extensive study and report will be used by NDTA, Basin Electric Power Cooperative (Basin Electric) and Montana-Dakota Utilities Co. (MDU) (the Partners) to effectively plan for critical infrastructure needs and development in North Dakota, South Dakota and Montana. The study and report includes analysis of petroleum-sector commercial and industrial development, employment, population growth and secondary employment.

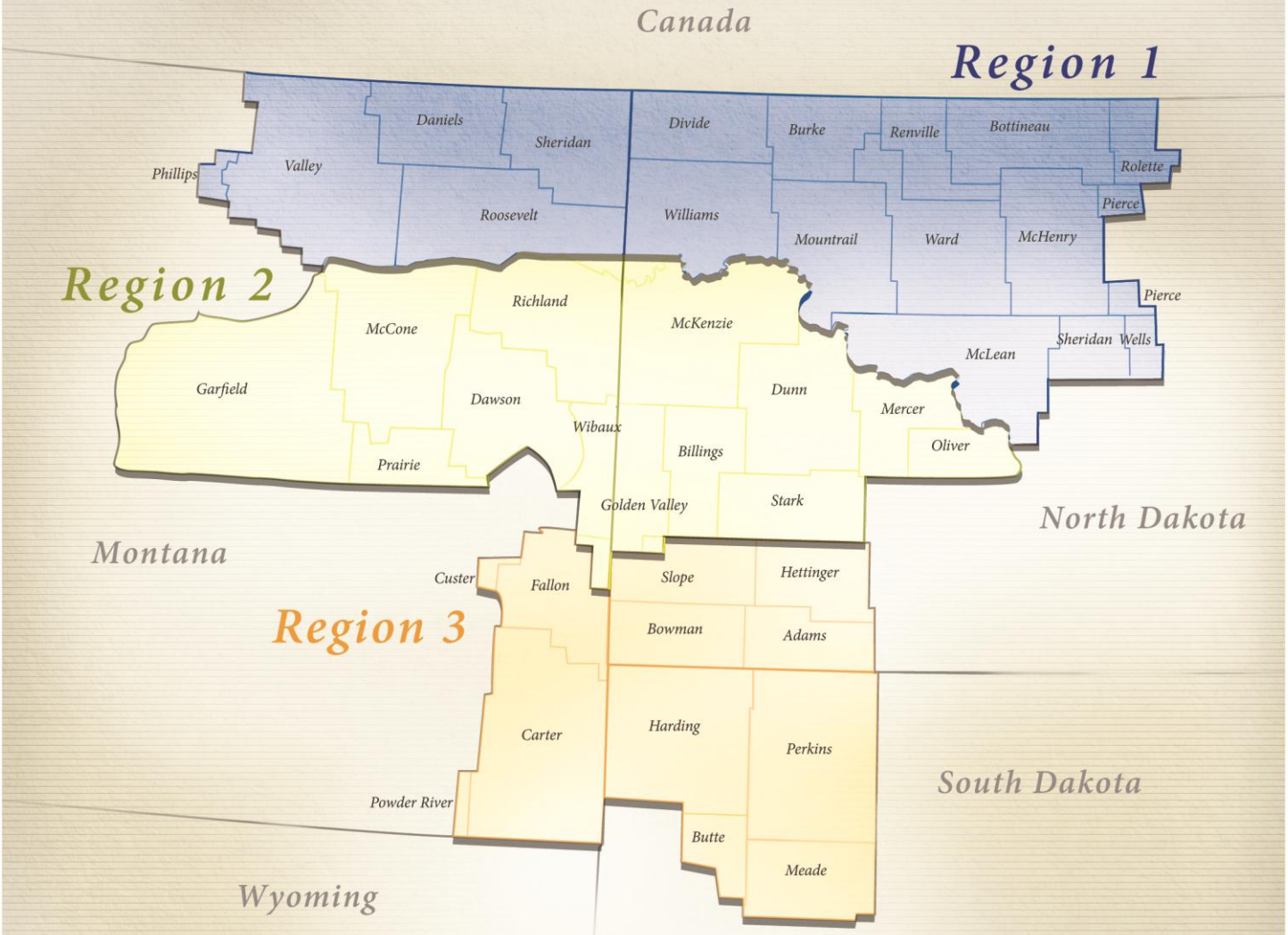
Findings contained in this study and report forecast expected electrical load growth for the next 20 years, from 2012 to 2032, in the study area which spans regions across North Dakota, South Dakota and Montana. These regions and the 43 counties they represent are shown in Figure 1. Numbers and figures in the Executive Summary were calculated from a demand amount averaged between historically observed energy use values and maximum oilfield electrical load requirements, and represent the study's most likely (consensus) scenario. Energy use for prior years was provided by the Partners and used to establish a 2011 baseline.

By the end of the study period in 2032, the 43 counties within the Williston Basin will require 2,512 megawatts (MW) of additional electrical demand, related to oil and gas development, to accommodate population growth, new ancillary business development and more than 30,000 additional wells (Table 1).

Williston Basin Cumulative Total New Wells					
	2012	**2017**	**2022**	**2027**	**2032**
High Scenario	2,097	12,551	21,801	29,115	34,126
Consensus Scenario	2,062	11,748	20,219	26,415	30,487
Low Scenario	2,027	10,141	16,881	21,586	24,865
There were 12,013 existing wells in the three study regions by the end of 2011.					

Table 1: Williston Basin Cumulative Total New Wells
Source: KLJ

The projected electrical load represents a 208 percent increase from the 1,209 MW area load demand required in 2012. The rise to the expected 3,721 MW electrical demand will consist of rapid increases up to 2017 followed by steady growth through 2032 (Figure 2).



Region 1: *Northeastern Montana and northwestern North Dakota, including the following counties:*

- *MT: Daniels, Phillips, Roosevelt, Sheridan, Valley*
- *ND: Bottineau, Burke, Divide, McHenry, McLean, Mountrail, Pierce, Renville, Rolette, Sheridan, Ward, Wells, Williams*

Region 2: *East central Montana and west central North Dakota, including the following counties:*

- *MT: Dawson, Garfield, McCone, Prairie, Richland, Wibaux*
- *ND: Billings, Dunn, Golden Valley, McKenzie, Mercer, Oliver, Stark*

Region 3: *Southeastern Montana, southwestern North Dakota and northwestern South Dakota, including the following counties:*

- *MT: Custer, Carter, Fallon, Powder River*
- *ND: Adams, Bowman, Hettinger, Slope*
- *SD: Butte, Harding, Meade, Perkins*

Figure 1: WILLISTON BASIN STUDY REGIONS
Source: North Dakota Transmission Authority

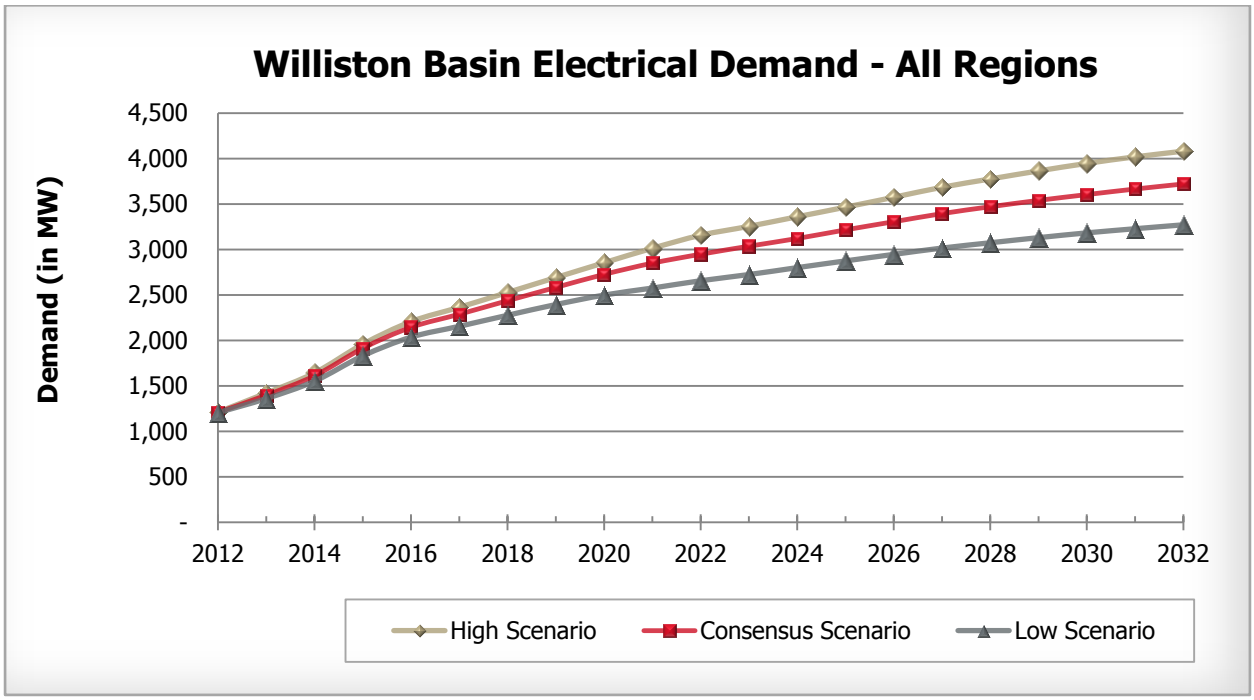


Figure 2: Williston Basin Electrical Demand – All Regions
Source: KLJ

The period between 2012 and 2017 represents the most significant increase in the 20-year study period with a rise to 2,288 MW, nearly doubling today's demand in the study region. Between 2017 and 2032 the expected growth continues steadily representing maturing oilfield development, near completion of pipeline build-out and stabilization of well pumping requirements.

The number of wells creates the most significant energy demand throughout the 2012 to 2032 study period. The rapidly growing number of wells, represented by large commercial and industrial sectors of the study area, begins to quickly overshadow the electrical demand growth from other energy sectors.

Region 1 will demand the most electricity of the three regions, almost 1,998 MW. Region 1 encompasses five Montana counties and 14 North Dakota counties. Region 2, made up of six counties in Montana and seven counties in North Dakota, will demand the next highest amount of electricity at 1,495 MW. Region 3 trails behind with a little more than 228 MW and includes 12 counties—four in each of the three states of North Dakota, South Dakota and Montana. Counties that will experience the highest megawatt demand increase in each of the three regions are indicated in Table 2.

Also of major significance are areas within the three regions that have been classified as future oilfield infrastructure loads for electrical power needs. These oilfield infrastructure loads, or locations of future significant oil and gas facilities, explain large increases in remote counties outside core oilfield development areas. These oilfield infrastructure loads also contribute to increases in population, which ignites higher electricity demands.

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