

### OVERVIEW

The North Dakota Transmission Authority (Authority) was created by the North Dakota Legislative Assembly in 2005 at the request of the North Dakota Industrial Commission. The Authority's mission is to facilitate the development of transmission infrastructure in North Dakota. The Authority was established to serve as a catalyst for new investment in transmission by facilitating, financing, developing and/or acquiring transmission to accommodate new lignite and wind energy development. The Authority is a builder of last resort, meaning private business has the first opportunity to invest in and/or build needed transmission.

By statute the Authority membership is comprised of the members of the North Dakota Industrial Commission. Tyler Hamman was appointed Director of the Authority in July 2015. The Director works closely with the Executive Director of the NDIC, Ms. Karlene Fine. The Authority has no other staff, and receives no direct general fund appropriation.

## SUMMARY OF ACTIVITIES

Whether the issue is project development or legislative initiatives, the Authority is actively engaged in seeking ways to improve North Dakota's energy export capabilities along with transmission capabilities within the state. To be successful Authority staff must have an understanding of the technical and political challenges associated with moving energy from generator to satisfied customer. Outreach to existing transmission system owners and operators and potential developers in order to understand the nuances of successful transmission infrastructure development is necessary. Another key element for success is working with officials at the state and federal levels to ensure that legislation and public policy are designed to support the movement of electricity generated from North Dakota's abundant energy resources to local, regional and national markets.

# NORTH DAKOTA INDUSTRIAL COMMISSION



Governor



Wayne Stenehjem Attorney General



Doug Goehring
Agriculture Commissioner

### NORTH DAKOTA TRANSMISSION AUTHORITY



Tyler Hamman Director

## STATUTORY AUTHORITY

Statutory authority for the Transmission Authority is found in chapter 17-05 of the North Dakota Century Code. Section 17-05-05 N.D.C.C. delineates the powers of the Authority, including:

- 1) make grants or loans to borrow money;
- 2) issue up to \$800 million in revenue bonds;
- 3) enter into lease-sale contracts;
- 4) own, lease, rent and dispose of transmission facilities;
- 5) enter into contracts to construct, maintain and operate transmission facilities;
- 6) investigate, plan, prioritize and propose transmission corridors; and
- 7) participate in regional transmission organizations.

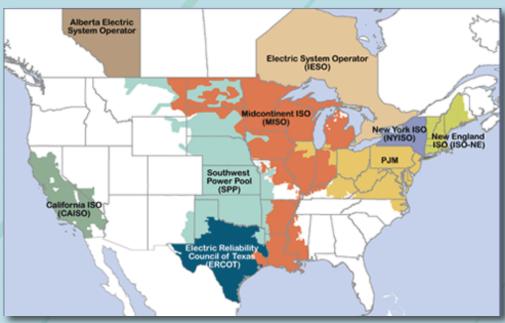
Before the Authority may exercise its power to construct transmission facilities, it must follow a process defined by statute to ensure public participation and comment. In particular, the Authority must publish a notice describing the need for the transmission project. Entities interested in construction of the facilities or furnishing services to satisfy the identified needs have 180 days to respond by filing a notice of intent. If the Authority receives a notice of intent from an interested entity, it may not exercise its power to construct unless the Authority makes a finding that doing so would be in the public interest. In making such a finding, the Authority shall consider the economic impact to the state, economic feasibility, technical performance, reliability, past performance, and the likelihood of successful completion and ongoing operation.

The Authority may finance approved projects through the issuance of bonds. Under current law up to 30 percent of the cost of a project may be financed by selling bonds that include the moral obligation of the State of North Dakota. In other words, up to \$240 million of the Authority's \$800 million total bonding authority may be sold with the moral obligation of the state. The moral obligation component enhances the marketability of the Authority's bonds.

# KEY ELEMENT: PLANNING

A major portion of the Authority's workload includes observation and achieving a high level of understanding of regional transmission planning. To accomplish this task, the Authority closely monitors and participates in the efforts of regional transmission organizations (RTOs) that represent North Dakota transmission developers. Authorized and recognized by the Federal Energy Regulatory Commission (FERC), RTOs oversee the efficient and reliable operation of the transmission grid. While RTOs do not own any transmission assets, they do provide non-discriminatory access to the electric grid, manage congestion, provide billing and settlement services, and oversee planning, expansion, and interregional coordination of electric transmission.

Many North Dakota service providers have long been participants in the Midcontinent Independent System Operator (MISO). The MISO footprint covers the service territories of Otter Tail Power (OTP), Montana-Dakota Utilities (MDU), Great River Energy (GRE), Xcel, and Missouri River Energy Services (MRES). In October 2015, the Western Area Power Administration (Western) and Basin Electric Power Cooperative (BEPC) officially joined the Southwest Power Pool (SPP), bringing the entire state of North Dakota under the transmission planning of RTOs. Combined, North Dakota utilities and transmission developers are part of an extremely complex system that oversees the transmission of over 200,000 megawatts of electricity across 100,000 miles of transmission lines so that utilities can deliver power to homes and businesses in all or part of 20 states.



FERC-Recognized Regional Transmission Organizations and Independent System Operators (www.ferc.gov)

#### MISO TRANSMISSION EXPANSION PLANNING (MTEP)

Each year, MISO begins an extensive planning process to determine transmission infrastructure needs. MTEP runs on an 18-month cycle beginning in June with a final report released in December of the following year. Transmission infrastructure identified during MTEP is intended to meet local and regional reliability standards, enable competition among wholesale energy generators, and allow for competition among transmission developers. MTEP has resulted in \$17.9 billion in transmission investments across the MISO footprint since 2003.

MTEP takes into account three specific categories of transmission projects:

- 1. **Bottom-Up Projects** Generally not cost-shared and are developed by transmission owners, includes Baseline Reliability Projects (BRP) required to meet North American Electric Reliability Corporation (NERC) standards. Other projects can include meeting local reliability needs and other drivers that are not necessarily a part of the bulk electric system. MISO evaluates bottom-up projects submitted by transmission owners in order to validate that the project is a practical solution to the identified transmission issue.
- 2. **Top-Down Projects** Includes Market Efficiency Projects (MEP) and Multi-Value Projects (MVP) at the regional or sub-regional level. These projects are generally developed by MISO working in conjunction with stakeholders. MEPs are intended to reduce market congestion across a given area, while MVPs provide policy, economic, and/or reliability benefits.

Top-Down Projects that provide significant benefit to MISO customers are generally cost-shared across the MISO footprint. Projects of particular importance to North Dakota are the Big Stone South to Ellendale, the Big Stone to Brookings, and Brookings to Twin Cities MVP lines. The Brookings to Twin Cities line was energized in March of 2015, while the Big Stone South to Ellendale and Big Stone to Brookings lines remain under construction

3. **Externally Driven Projects** – These projects are driven by customer-initiated needs and include Generation Interconnection Projects (GIP) to connect new generation to the grid, Transmission Delivery Service Projects, and Market Participant Funded Projects that provide benefit to one or more market participants but do not qualify as a BRP, MEP, or MVP.

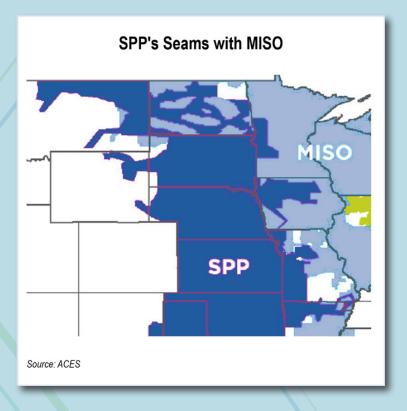


### MTEP16 Projects Recommended for North Dakota

	_	MTEP 16 Projects Identified for North Dakota				
GRE	C023 - Stanton 31RB3	Jumper replacement inside Stanton Substation at 230 kV breaker 31RB3.	ND	GIP	\$33,033	Externally-Driven
MDU	Leola	A new 115 kV transmission line from the Ellendale Jct. Substation to a new Leola Jct. 115/41.6 Substation. The new Leola Jct. substation will connect to the existing Ellendale-Bowdle 41.6 kV line.	SD,ND	Other	\$12,835,000	Bottom-up
MDU	Heskett-Mandan 115 Upgrade	Replace limiting switches in the Heskett substation on the Mandan 115 kV line.	ND	Base Rel	\$125,000	Bottom-up
MDU	TSR F109/A 634	Reconductor Coyote-Beulah 115 kV line	ND	TDSP	\$350,000	Externally-Driven
OTP	Devils Lake East 41.6 kV	Relay upgrades	ND	Other	\$37,500	Bottom-up
OTP	Devils Lake SW 41.6 kV	Relay upgrades	ND	Other	\$37,500	Bottom-up
OTP	Rugby 41.6 kV Breakers	Install four 41.6 kV Breakers in the Rugby area to re- terminate existing OTP-owned 41.6 kV circuits from CPEC- owned Rugby substation to 230 kV delivery.	ND	Other	\$2,000,000	Bottom-up
ОТР	Max to Ryder 41.6 kV Line Upgrade	The project will start in 2016 and be completed in 2018. The project will replace failing insulation, cross arms and poles identified through patrols and inspections and replace the failing 1/0 ACSR conductor for approximately 34 miles between Max, ND and Ryder, ND.	ND	Other	\$2,500,000	Bottom-up
OTP	Western ND 41.6 kV Breaker Stations	Western ND 41.6 kV Breaker Stations will consist of 3 Facilities  1. Cole harbor - Single in-line circuit breaker addition  2. Drake - Single in-line circuit breaker addition  3. Granville Jct Three circuit breaker addition	ND	Other	\$1,500,000	Bottom-up
XEL	MPC Fossum Interconnection	This project will convert the Prairie Substation to a breaker-in-a-half configuration to accommodate MPC's Fossum 115 kV interconnection request. Fossum will operate radially.	ND	Other	\$17,261,500	Bottom-up

#### MISO-SPP Joint Transmission Study

Following approval by the SPP Seams Steering Committee, and the MISO Interregional Planning Stakeholder Advisory Committee, it was agreed that the two RTOs would conduct a joint study to look at the newly created Integrated System "seam" between their markets in the Upper Midwest (primarily North Dakota, South Dakota, and Iowa). Seam issues are generally trading barriers that can arise when there are differences between market rules and designs that can affect the efficiency and reliability of transmission where two RTOs border each other. The Joint Planning Committee expects to complete the study by the end of 2017.





#### Federal Issues Impacting Transmission Planning and Development

The November 2016 election brought with it a sea change in regulations impacting the generation and transmission of electric power. It was reasonably expected that a President Clinton Administration would have continued implementation of many of the regulations finalized by President Obama. However, soon after taking office, President Donald Trump signed the Energy Independence Policy Executive Order, effectively repealing the Environmental Protection Agency's Clean Power Plan and many other regulations impacting the energy industry.

As proposed in June 2014, the EPA's Clean Power Plan mandated a 30 percent reduction in carbon dioxide levels from electric power generation by 2030, with an eleven percent reduction target for North Dakota. However, the final rule, released in August 2015, presented a dramatic departure from the draft rule. While it increased the target nationally from a 30 percent to a 32 percent reduction in carbon dioxide levels, it more than quadrupled its requirement for North Dakota by mandating a 45 percent reduction in carbon dioxide within the state by 2030. Although the Clean Power Plan did not affect transmission directly, it would have significantly impacted power generation in the state and how transmission is utilized to transfer energy across the grid.

MISO's analysis of the proposed rule and analysis of the final rule indicate that the Clean Power Plan would have significantly increased congestion on the grid, and that multi-billion dollar transmission buildout would be necessary for compliance. New transmission investment would have been driven by retirement of existing power generation facilities and the location and type (i.e., intermittent vs. baseload) of replacement capacity. Transmission expansion would be particularly needed to mitigate reliability impacts of coal retirement.

Under MISO's mid-term analysis of the Clean Power Plan, released in March of 2016, it found that compliance could have lead to the retirement of 23-30 percent of its coal-fired generation across the MISO footprint by 2030. The analysis further highlighted the challenge of balancing new renewable generation with the necessary transmission to deliver that energy across the system. Similarly, the SPP projected that up to 13.9 gigawatts of generation across its footprint could have been at-risk for retirement due to compliance with the Clean Power Plan, representing approximately 50 percent of its coal-fired generation. Further, the SPP estimated compliance costs of approximately \$2.9 billion per year before considering costs of new transmission or other infrastructure to facilitate generator interconnection or power delivery.

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Following the Energy Independence Executive Order, the Trump Administration moved to formally repeal the EPA and Army Corps of Engineers' Waters of the United States (WOTUS) rule. This regulation would have dramatically expanded the Federal Government's jurisdiction over what is considered to be navigable waterways subject to regulation under the Clean Water Act. WOTUS had near unanimous opposition from the energy industry and agriculture due to the significant expansion in federal authority. The rule would have significantly increased permitting challenges for transmission development involving navigable waterways.

While these regulations have been repealed in their current form, it is anticipated that new regulations will be developed regarding electric generating units and navigable waterways. The Authority will continue to closely monitor these issues and work with stakeholders in North Dakota to advise and inform federal agencies of how these rules impact transmission development in the state.

#### Federal Energy Regulatory Commission

As mentioned, FERC plays a critical role in regulating the transmission and wholesale delivery of electricity in interstate commerce. This includes critical infrastructure projects that cross state boundaries. Unfortunately, due to the resignation of a majority of FERC Commissioners, FERC has been unable to carry out a number of its obligations without a quorum. President Trump has made two nominations to join sitting Commissioner Cheryl LaFleur, who currently await confirmation by the U.S. Senate.

#### Department of Energy Grid Study

On April 14, Department of Energy Secretary Rick Perry directed the DOE to initiate a study to "explore critical issues central to protecting the long-term reliability of the electric grid." In particular, Secretary Perry directed the department to focus on the following issues:

- The evolution of wholesale electricity markets, including the extent to which federal policy interventions and the changing nature of the electric fuel mix are challenging the original policy assumptions that shaped the creation of those markets;
- Whether wholesale energy and capacity markets are adequately compensating attributes such as on-site fuel supply and other factors that strengthen grid resilience, and if not, the extent to which this could affect grid reliability in the future; and

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• The extent to which continued regulatory burdens, as well as mandates and tax and subsidy policies, are responsible for forcing the premature retirement of baseload power plants.

While Secretary Perry asked for the study to be completed within 60 days of April 19, 2017, the DOE has yet to formally release a final or draft version of the study. As such, it remains to be seen what recommendations the study might contain regarding transmission development.

#### 2017 North Dakota Legislative Session

Energy development was once again a highly-debated issue during the North Dakota 65th Legislative Assembly that took place from January 3-April 27, 2017. Of particular interest to transmission development was H.B. 1144. This legislation was the result of utilities and transmission stakeholders identifying an interest in streamlining the Public Service Commission siting authorities. Previously, the North Dakota Energy Conversion and Transmission Facility Siting Act (Chapter 49-22 N.D.C.C.) applied to siting of both electric generation and transmission facilities, along with oil and gas processing and pipeline facilities.

H.B. 1144 separated the rules regarding siting of electric facilities from oil and gas facilities to address different infrastructure and siting needs of the two industries, as well as avoid unintended consequences of cross-industry impacts. The legislation received unanimous support from both chambers of the North Dakota legislature.

Another issue debated by the legislature pertained to need for proposed energy conversion and transmission facilities under the North Dakota Siting Act. As passed by the Senate, S.B. 2314 would have required an interim study considering a long-term energy plan for the state, including consideration of multiple energy sources such as coal, wind, and hydroelectric energy sources. The House of Representatives considered an amendment to S.B. 2314 that would have further amended the North Dakota Siting Act to authorize the Public Service Commission to consider need when evaluating applications for sites, corridors, and routes for new energy conversion and transmission facilities.

The House ultimately voted to reject the amendment. Supporters expressed that it was needed to give the PSC appropriate guidance to protect baseload generation and grid reliability, whereas opponents of the amendment felt that it was not necessary and would hamstring wind development in the state. Following debate and a vote on the amendment, the House also voted to not pass the underlying bill.

The Energy Development and Transmission Committee was tasked with continuing to study energy issues over the 2017-18 interim.



#### Federal Environmental Law Impact Review Committee

The Federal Environmental Law Impact Review Committee (FELIRC) was established during the 2015 North Dakota legislative session to review federal regulations that could bring detrimental impacts to the state and its affected industries, and confer with the Attorney General on potential administrative or judicial remedies. In 2016, the FELIRC began undertaking studies and data gathering for species that have a high likelihood of being listed under the Endangered Species Act in the near future. Comprehensive data is essential as listing decisions are based on the best available science at the time of the listing decision. These studies will ensure that the state and Federal Government have the best information onhand before proceeding with any listing decisions.

Given the impact that listed species and critical habitat designations can have on infrastructure development, the Authority joined a number of state and federal agencies in supporting these studies.

# KEY ELEMENT: OUTREACH

Outreach is another significant element of the Authority's mission. To accomplish this task, the Authority works with interested parties, either through one-on-contacts, or through participation with other organizations, agencies, and programs focused on transmission. These interactions are essential to identify issues and develop solutions to further improve and expand electric transmission in North Dakota.

#### **Tranmission Updates**

There are a number of projects underway to expand transmission available to North Dakota generators. These are summarized briefly below.

CapX2020 - CapX2020 is a Minnesota-based initiative of 11 utilities to upgrade and expand the transmission grid in the Upper Midwest. CapX2020 partners have worked together to plan and build nearly 800 miles of new high-voltage transmission lines across Minnesota, Wisconsin, North Dakota, and South Dakota, with a total investment of \$1.85 billion. Planning studies indicated that Minnesota customer demand for electricity will increase 4,000 to 6,000 megawatts (MW) by 2020. In addition, Renewable Energy Standards (RES) require utilities to deliver 25 percent of their electricity from renewable generation by 2025 in Minnesota, and 10 percent by 2015 in Wisconsin. New transmission lines designed to serve this expected growth and meet regional RES requirements are being constructed in phases. The lines identified in the first phase of the effort include:

Bemidji-Grand Rapids, 68 miles, 230-kV Fargo-St. Cloud-Monticello, 240 miles, 345-kV Hampton-Rochester-La Crosse, 150 miles, 345-kV Brookings County-Hampton, 200 miles, 345-kV Big Stone South-Brookings County, 70 miles, 345-kV

On September 16, 2016, the final segment of the Hampton-Rochester-La Crosse line was energized, bringing to fruition all of the CapX2020 projects. With the completion of the Hampton-Rochester-La Cross line, CapX2020 has built 725 miles of high voltage transmission line across Minnesota, North Dakota, South Dakota, and Wisconsin.



Photo Courtesy of CapX2020

**Basin Electric Power Cooperative Western ND Project –** In response to growth in western North Dakota related to oil and gas development, BEPC has undertaken the construction of a 200-mile 345kV line from the Antelope Valley Station (AVS) to the Neset Substation near Tioga, North Dakota. Construction of the line began in 2014, and the line has been completed and energized to the Judson Substation near Williston. The remaining segment to Neset is expected to be in-service by the end of 2017.

BEPC has also completed Phase I of the North Killdeer Loop. This portion consists of approximately 28-miles of 345kV line and two substations that tie into the AVS-Neset Line going west of Watford City. Phase I was energized in September of 2016. Phase II of the North Killdeer Loop is currently on-hold while it undergoes review by SPP.



AVS to Neset Line, including North Killdeer Loop

Image Courtesy of Basin Electric Power Cooperative **Big Stone South to Ellendale (BSSE)** – Construction began in 2016 on the Big Stone South to Ellendale MVP line. BSSE is a 150-175 mile transmission line from the proposed Big Stone South substation to the proposed Ellendale substation near Ellendale, North Dakota. Montana-Dakota Utilities Co. and Otter Tail Power Company will jointly own the line. MISO has scheduled the line to be in service by 2019.

**Great River Energy High Voltage Direct Current (HVDC) Refurbishment** – In December 2015, GRE's Board of Directors approved the largest transmission refurbishment project in the organization's history. GRE's 436-mile HVDC line has provided 99 percent reliability since being put into service in 1978, transporting power from the Coal Creek Station in Underwood, N.D., to the Dickinson Converter Station in Buffalo, MN. There, electric power is converted to alternating current and distributed within GRE's service territory in Minnesota. GRE intends to invest approximately \$200 million over the next decade to overhaul converter stations, replace valve electronics, and upgrade components to improve performance and extend the life of the HVDC line.

Montana-Dakota Utilities Subtransmission Improvements – MDU is currently focused on several projects to replace aging subtransmission infrastructure. Since 2015, MDU has replaced several miles of 115 kV line, including 35 miles from Kenmare to Lignite, N.D., as well as a 9-mile double-circuit line near Williston, N.D. In 2016, MDU began work on a 12-mile loop-feed line to increase reliability around Watford City, N.D. In addition to its subtransmission lines, MDU is also conducting work on substations near Williston, Kenmare, and Dickinson.

Great Northern Transmission Line Project - The Great Northern Transmission Line Project includes approximately 225 miles of new 500 kV transmission line connecting Manitoba to northeastern Minnesota's Iron Range. While not directly impacting North Dakota, the Great Northern Transmission Line is an integral component to realizing the regional benefits of synergies between flexible Canadian hydropower resources and intermittent wind resources in North Dakota and the rest of the Upper Midwest, as demonstrated in MISO's Manitoba Hydro Wind Synergy Study. Minnesota Power received Route Permit approval from the Minnesota Public Utilities Commission in April 2016, and was issued a Federal Presidential Permit in November 2016. Tree clearing and other construction activities commenced in 2017 and the project is still expected to meet the required in-service date of June 1, 2020.

# KEY ELEMENT: GOVERMENT ACTION

Another function of the Authority staff is to act as a resource for elected officials and policymakers, and provide the necessary information to help make informed decisions. Whether the issue involves working on state energy policy regarding transmission development, or commenting on federal transmission legislation and regulations, the Authority serves as a resource for decision-makers. In the last year the Authority was involved on several fronts working with the following entities: the EmPower ND Commission, Governor's Office, Attorney General's Office, Department of Commerce, the ND Public Service Commission, and the ND Congressional Delegation.

- EmPower ND Commission The Authority was an active participant in the EmPower ND Commission work. Authority activities included briefing the Commission on transmission issues in North Dakota and participating in development of Commission goals. The 2016 EmPower ND report highlighted transmission as a key infrastructure need in North Dakota, and expressed support for continued support of R&D funding to facilitate development of transformational energy technologies, as well as enhance understanding of integration between traditional and renewable electric generation sources.
- Interagency Coordination As important as everything else discussed in this report, is the coordination of efforts among the various government entities with oversight, or interest in transmission development. In particular, regular meetings are held with the representatives from the Public Service Commission to discuss transmission issues and receive updates from RTOs. On occasion other offices request technical support and policy guidance from Authority staff.

### CONCLUSION

The North Dakota legislature established the Authority over a decade ago to help facilitate the expansion of transmission capacity and take advantage of North Dakota's vast energy resources to serve the needs of North Dakota and the region. Since that time, the question of expanding and improving transmission has only grown increasingly more complex. As utilities seek to integrate more intermittent generation on the grid, changes to the transmission system must be made with great care to ensure the reliability of the existing system. Further, as the cadre of stakeholders expands and regulatory pressure intensifies, the roles of planning and outreach continue to grow to enable transmission development.

As depicted below, transmission lines in recent years must be constructed to satisfy multiple siting demands. Regulatory requirements, as well as right-of-way acquisition and landowner approval, have increased the length, and consequently, the cost of new transmission. Today the cost to construct a new high-voltage transmission line ranges approximately \$1-1.5 million per mile.



Photo Courtesy of Basin Electric

The past decade also saw a significant increase in load growth both within the State of North Dakota and the surrounding region. A 2012 study commissioned by the Authority forecast an expected electrical load growth through 2032, in the study area spanning regions across North Dakota, South Dakota, and Montana. While that study did not project the more recent reduction in commodity prices for energy and agriculture, and the associated slowdown in industrial activity, utilities continue to expect increased demand for electricity through this timeframe. As a result, new transmission will be needed to deliver that power.

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Given this outlook, the Authority continues its mission to identify regulatory changes that should be considered to ease and incentivize transmission development in the state. The past year has witnessed significant actions relating to federal regulations that will greatly impact transmission requirements and construction. While both WOTUS and the Clean Power Plan have been rescinded, environmental regulations continue to weigh heavily on the future use and development of transmission.

In addition, the action taken by Congress to provide a multi-year extension of the wind energy Production Tax Credit continues to drive significant growth in wind production. North Dakota currently has over 2,800 MW of wind energy capacity installed, with several hundred more having been permitted to-date. As mentioned, the growing integration of intermittent electric resources onto the transmission grid creates many new challenges, as well as opportunities for innovation in grid management and new transmission technologies. The conversation continues to escalate about the role of baseload power in the current wholesale energy market as the market share for intermittent generation grows. The results of the DOE's upcoming grid study will likely spur further insight into necessary policy changes to ensure that baseload power can compete in an energy market disrupted by federal incentives and the intermittent nature of renewable generation, as well as address their impact on the bulk electric system.

The Authority also continues to closely monitor the burgeoning issue of cybersecurity as both FERC and NERC discuss standards and practices to protect the electric grid from the threat of cyber-attacks. While not directly impacting the construction of new transmission lines, cybersecurity plays an integral role in grid operations and infrastructure necessary to maintain a secure, yet flexible transmission system.

While it remains to be seen exactly how these factors will impact the state and what response might be needed from policymakers, the Authority continues to participate with industry and other state partners to prepare the best possible environment for meeting the goals and energy needs of North Dakota.

Despite a litary of challenges and uncertainty, transmission continues to be built in new and innovative ways that improve efficiency and reduce environmental impacts. Several hundred miles of new transmission has been developed in North Dakota by private investors since the North Dakota Transmission Authority was established, and it will continue to serve its mission to facilitate development.

