

# NORTH DAKOTA TRANSMISSION AUTHORITY

ANNUAL REPORT

July 1, 2015 - JUNE 30, 2016

# 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



Jack Dalrymple  
Governor



Wayne Stenehjem  
Attorney General



Doug Goehring  
Agriculture Commissioner



Tyler Hamman  
Director

## NORTH DAKOTA TRANSMISSION AUTHORITY

# 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.

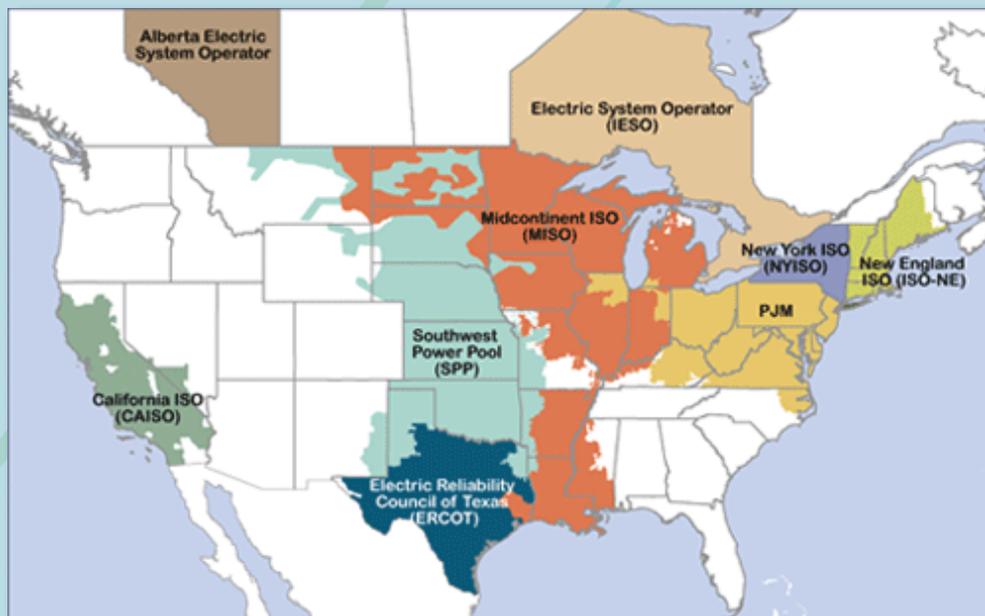
Before the Authority may exercise its power to construct transmission facilities, it must follow a process defined by statute to ensure public participation and comment. In particular, the Authority must publish a notice describing the need for the transmission project. Entities interested in construction 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](http://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.

**MTEP15:** The 12th edition of the MTEP recommended the approval of 345 new transmission projects totaling \$2.75 billion to the MISO Board of Directors, including 90 BRPs. MTEP15 projects that 4,600 miles of transmission lines will be upgraded along existing corridors, and 3,100 miles of new transmission line will be constructed over the 10-year planning horizon.

In North Dakota, MTEP15 recommended that MISO approve three GIPs, and two BRPs. These projects include upgrades to transformers, new substations, and rebuilt or new transmission. Of particular note, it is recommended that a new 230kV line be constructed in Ward County, between Minot to the McHenry Substation. At approximately \$63.3 million, the joint project between BEPC and Xcel is among the top ten largest in the MTEP15 and is expected to be in-service by September 2018

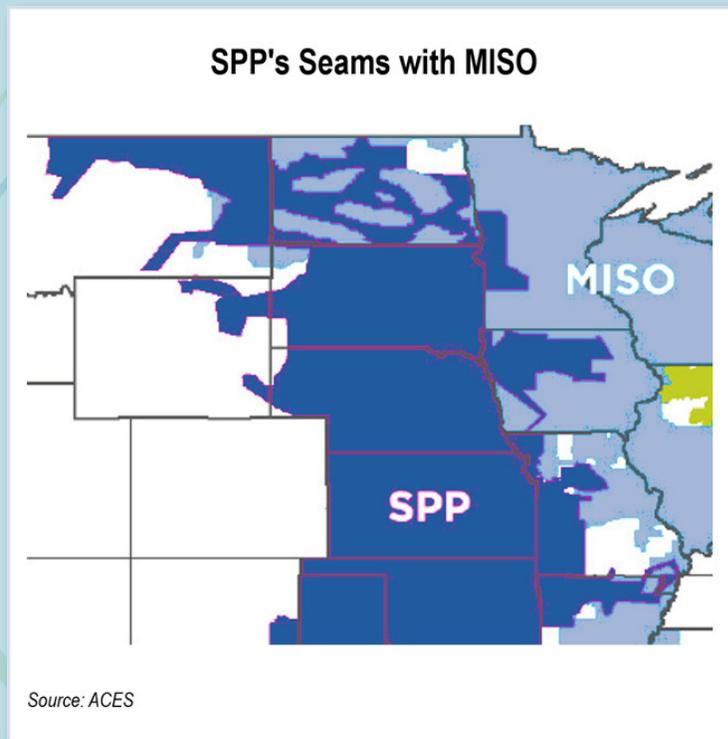


Top 10 MTEP15 new Appendix A projects  
([www.misoenergy.org](http://www.misoenergy.org))

**MTEP 16:** With the next MTEP already underway, planners are considering approximately two dozen projects that have been submitted to improve transmission in North Dakota. It remains to be seen which projects will ultimately be recommended in MTEP16, or will be deferred for future MTEPs.

# 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 is currently determining the full scope and hope to conclude the study by the first quarter of 2017.



# CLEAN POWER PLAN

As proposed in June 2014, the Environmental Protection Agency'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 does not affect transmission directly, it will significantly impact power generation in the state and how transmission is utilized to transfer energy across the grid.

North Dakota and 26 other states subsequently filed suit against the Clean Power Plan, and achieved the first-ever stay of an administrative rule from the U.S. Supreme Court. While the stay remains in effect until a decision from the D.C. Circuit Court of Appeals, and subsequent decision from the U.S. Supreme Court, MISO and many other entities are in the process of analyzing the rule's impact.

MISO's analysis since the release of the proposed rule and analysis of the final rule indicate that the Clean Power Plan will significantly increase congestion on the grid, and that multi-billion dollar transmission buildout will be necessary for compliance. New transmission investment will be driven by retirement of existing power generation facilities and the location and type (i.e., intermittent vs. baseload) of replacement capacity. Transmission expansion is 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 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 projects that up to 13.9 gigawatts of generation across its footprint could be at-risk for retirement due to compliance with the Clean Power Plan, representing approximately 50 percent of its coal-fired generation. Further, the SPP estimates 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.

North Dakota, through the Public Service Commission, is also represented in the Organization of MISO States (OMS), as well as by MISO members who continue to review the final rule. The OMS is a not-for-profit association comprised of retail energy regulators within the MISO region, consumer advocates, energy planning offices, and agencies involved in energy related environmental issues. The purpose of the OMS is to coordinate regulatory oversight of wholesale matters by making recommendations to MISO management and staff, the MISO Board, FERC, other government entities and state commissions as appropriate, as well as intervene in proceedings before FERC and the courts as appropriate.

Pending the legal outcome on the Clean Power Plan, if the regulation goes into effect as-is, it will undoubtedly bring a need for new transmission depending on how North Dakota's existing generation plants are dispatched and new generation is developed to comply with the rule. The Transmission Authority continues to closely monitor this regulation with its state and regional partners.

## Clean Power Plan Timeline

15 Years

- January 1, 2030 - CO<sub>2</sub> Emission Goals met

Summer  
2015

- August 3, 2015 - Final Clean Power Plan

1 Year

- September 6, 2016 - States submit initial state plan

3 Years

- September 6, 2018 - States submit final state plan

7 Years

- January 1, 2022 - Compliance period begins

### Clean Power Plan Compliance Timeline

NOTE: This does not reflect U.S. Supreme Court Stay. Compliance deadlines may be pushed back by the amount of time the rule was under legal review.

## *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-one-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.

As North Dakota approaches the 2017 legislative session, utilities and transmission stakeholders have identified an interest in streamlining Public Service Commission siting authorities. Currently, the North Dakota Energy Conversion and Transmission Facility Siting Act (Chapter 49-22 N.D.C.C.) applies to siting of both electric generation and transmission facilities, along with oil and gas processing and pipeline facilities. Stakeholders believe that the statute needs to be amended to, separate 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.

Other issues identified through outreach include modification of rights-of-way tenure for utility infrastructure, and concerns about U.S. Fish and Wildlife Service guidelines pertaining to transmission lines within wildlife corridors. The Authority continues to gather additional information regarding potential legislative proposals for the 2017 session.

# TRANSMISSION 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 \$2.1 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

With the completion of the Fargo-St. Cloud-Monticello, and Brookings-County-Hampton line in 2015, all but two of the CapX2020 projects have been put into service. The Big Stone South-Brookings County line is targeted to be in-service in 2017, and the Hampton-Rochester-La Crosse line is expected to be completed in 2016.

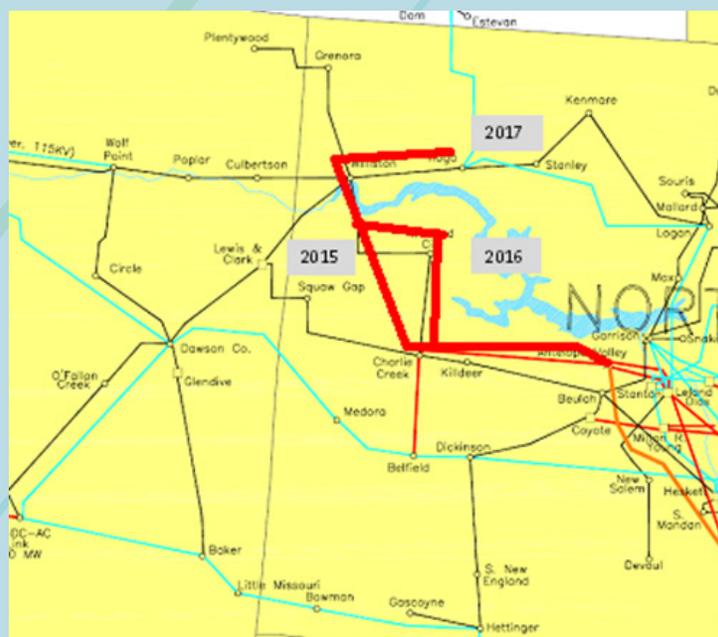


Photo Courtesy of CapX2020

**Minnkota Power Cooperative Project** – In 2014, Minnkota saw the completion of its largest-ever capital investment in transmission facilities. The \$353 million, 250-mile Center to Grand Forks (CGF) line transports energy from the Milton R. Young Station near Center, N.D., to Minnkota's service territory in eastern North Dakota and northwest Minnesota. The CGF line also enabled 500 MW of wind energy to be installed in central North Dakota and transmitted over an existing high-voltage DC line to northeastern Minnesota. This line is expected to satisfy Minnkota's obligation as a transmission services provider and meet long-term load growth needs. As such, Minnkota did not indicate the need to begin developing any large transmission projects in 2015.

**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 is also nearing completion of 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 is expected to be energized by the end of August 2016 and will deliver power to the service territory of the McKenzie Electric Cooperative. BEPC is in the process of securing easements for Phase II of the North Killdeer Loop, which will be placed north of Killdeer, and is expected to be completed by the end of 2017.



AVS to Neset Line, including North Killdeer Loop

**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 220 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 hydro-power 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 approval from the Minnesota Public Utilities Commission in April 2016, and is awaiting issuance of a Federal Presidential Permit. Construction is expected to begin in 2017 in order to meet the required in-service date of June 1, 2020.

**ALLETE Energy Corridor** -ALLETE Clean Energy continues to develop the concept of a comprehensive energy corridor that would utilize existing pathways to efficiently move natural gas, petroleum products, water and wastewater, wind energy and potentially carbon dioxide captured from coal-fired power plants.

The backbone of the energy corridor would be an existing 465-mile path that contains a direct current transmission line running between Center, North Dakota, and Duluth, Minnesota. The energy corridor may parallel adjacent right of way along this existing path, as well as a potential addition that would extend some 60 miles west to the Bakken shale oil fields.

**Xcel Energy Transmission Development Company** - Xcel Energy Transmission Development Company, LLC (XETD) received conditional approval in November of 2014 for a transmission Formula Rate for inclusion in the MISO Open Access Transmission, Energy and Operating Reserve Markets Tariff. XETD is a transmission-only company established by Xcel Energy Inc. to, among other things, develop and own transmission projects in the MISO region. With development of the FERC Order 1000 competitive bid process now complete, XETD will be an active participant in transmission development in the MISO region.

## KEY ELEMENT: GOVERNMENT 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.
- **Western North Dakota Energy Development Information Exchange Council** - At the request of the Governor, Basin Electric, MDU and the Transmission Authority serve on the Western North Dakota Energy Development Information Exchange Council. The purpose of this Council is to serve as a conduit for the exchange of future energy development plans in the Williston Basin. Other members of the Council include several oil and gas companies and representatives from the Department of Health, Department of Commerce, Department of Mineral Resources and State Water Commission.

# 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.

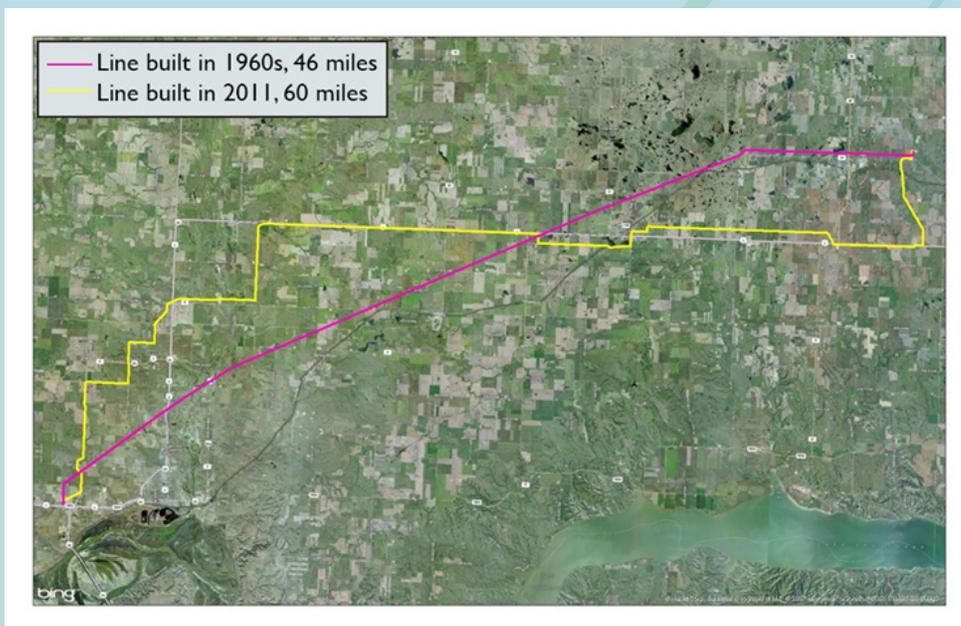


Image Courtesy of Basin Electric

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 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.

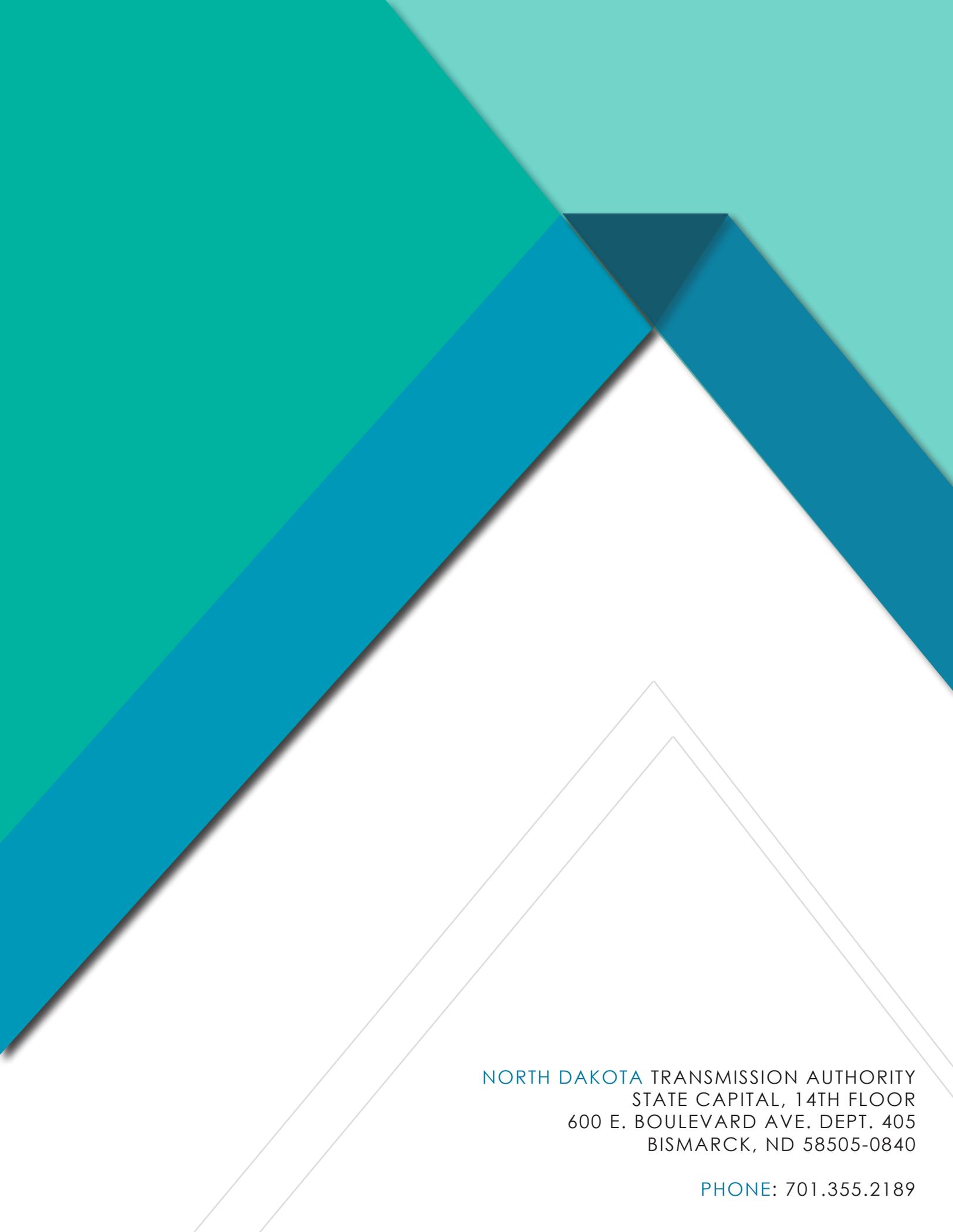
Given this outlook, the Authority continues its mission to identify regulatory changes that should be considered to ease and incentivize transmission development in the state. The past year has witnessed significant actions relating to federal regulations that will greatly impact transmission requirements and construction. The EPA's Waters of the U.S. rule, and Clean Power Plan were both stayed by the courts to prohibit their implementation until it can be determined whether these regulations are lawful. Whether the courts ultimately uphold these rules, overturn them in their entirety, or send them back to the EPA to make changes, they continue to weigh heavily on the future use and development of transmission.

In addition, the action taken by Congress last year 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 2,100 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 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 litany 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.



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