STATE OF MINNESOTA
BEFORE THE
PUBLIC UTILITIES COMMISSION

Katie Sieben	Chair
Matthew Schuerger	Commissioner
John Tuma	Commissioner
Valerie Means	Commissioner
Joseph Sullivan	Commissioner

IN THE MATTER OF THE MINNESOTA TRANSMISSION OWNERS' 2019 BIENNIAL TRANSMISSION PROJECTS REPORT	DOCKET NO. E002/M-19-205 **COMPLIANCE FILING**

INTRODUCTION

On May 14, 2020, the Minnesota Public Utilities Commission ("Commission") met and voted to accept the Minnesota Transmission Owners' ("MTO") Biennial Transmission Report dated October 31, 2019 ("Biennial Report"). In its motion accepting the Biennial Report, the Commission required the MTO to make a compliance filing providing the following:

> 4. Require the MTO to make a compliance filing by August 15, 2020, including initial discussion and recommendations for next steps for identifying gaps between the existing and currently planned transmission system and the transmission system that will be required to meet the companies' publicly stated clean energy goals in the Minnesota Biennial Transmission Projects Report process. The MTO will include a full discussion and analysis in the next biennial report.

CLEAN ENERGY GOALS

The following table provides the publicly-stated clean energy goals for each MTO member. While some MTO members have long-term stated goals, this compliance filing focuses on the transmission planning processes necessary to meet the related transmission needs in the next decade.

CLEAN ENERGY GOALS	
American Transmission Company	
Stated Goal	**Comment**
N/A – transmission only entity.	N/A
Central Minnesota Municipal Power Agency ("CMMPA")	
Stated Goal	**Comment**
N/A	CMMPA currently provides approximately 43 percent of its energy needs from carbon free resources.
Dairyland Power Cooperative ("Dairyland")	
Stated Goal	**Comment**
Dairyland is transitioning to a more diverse and balanced generation portfolio, with the goal of reducing carbon intensity in a reliable and affordable manner for our members. As Dairyland develops our Sustainable Generation Plan for continued energy diversification, carbon reduction and system reliability are central issues. Ambitious goals are based on informed, holistic policy to ensure a reliable and sustainable asset mix for Dairyland's member cooperatives.	Dairyland's focus is on reducing economy-wide carbon emissions. Our initiatives to foster beneficial electrification, combined with our progressive investments in renewable resources support this evolution. For example, Dairyland announced two major renewable energy investments in 2019: a Power Purchase Agreement ("PPA") with Ranger Power for the proposed 149 megawatts ("MW") Badger State Solar facility (Wisconsin) and a PPA with Avangrid Renewables for the proposed 52 MW Tatanka Ridge wind energy facility (South Dakota).
East River Electric Power Cooperative ("East River")	
Stated Goal	**Comment**
N/A	From 2013 to the date of this filing, East River's power supplier, Basin Electric has entered into 10 PPAs for a total of 1,468 MW of wind and solar power. Of that, 848 MW of wind projects were operating as of May 2020. A PPA for 200 MW was signed in 2016 for the Northern Divide Wind project which is scheduled to be operational by the end of 2020. In addition to that, a PPA for 142 MW was signed in 2019 for the Aurora Wind project which is scheduled to deliver energy starting January 1, 2023. Three solar PPAs totaling 178 MW were signed in late 2019 and May 2020. The Wild Springs Solar project and the Cabin Creek I and II Solar projects are scheduled to be operational by the end of 2022 and 2023, respectively.

Great River Energy	
Stated Goal	**Comment**
Serve its all-requirements member-owner cooperatives with energy that is 50 percent renewable by 2030.	Great River Energy is committed to an escalating, annual renewable energy goal for its all-requirements members: 25 percent through 2019, 30 percent starting in 2020, 40 percent starting in 2025, and 50 percent starting in 2030. Great River Energy has executed 910 MW of new wind purchases that will supply 3.5 million MWh per year, which combined with existing renewable purchases, is projected to exceed these renewable goals. These new wind projects are expected to be operational in the 2021-2024 period, provide low cost energy to our member-owners, and reduce Great River Energy's power supply carbon intensity.
ITC Midwest	
Stated Goal	**Comment**
N/A – transmission only entity.	N/A
L&O Power Cooperative ("L&O")	
Stated Goal	**Comment**
N/A	From 2013 to the date of this filing, L&O's power supplier, Basin Electric, has entered into 10 PPAs for a total of 1,468 MW of wind and solar power. Of that, 848 MW of wind projects were operating as of May 2020. A PPA for 200 MW was signed in 2016 for the Northern Divide Wind project which is scheduled to be operational by the end of 2020. In addition to that, a PPA for 142 MW was signed in 2019 for the Aurora Wind project which is scheduled to deliver energy starting January 1, 2023. Three solar PPAs totaling 178 MW were signed in late 2019 and May 2020. The Wild Springs Solar project and the Cabin Creek I and II Solar projects are scheduled to be operational by the end of 2022 and 2023, respectively.
Minnesota Power	
Stated Goal	**Comment**
Deliver 50 percent renewable energy to our customers by 2021.	At Minnesota Power, our Energy*Forward* strategy has guided the addition of wind and solar energy to our portfolio while removing approximately 700 MW of coal generation. Our plans include the addition of another 250 MW of wind energy in 2020, 250 MW of hydropower in 2020 and 20 MW of solar by 2022. We expect Minnesota Power's energy mix to be about 50 percent renewable by 2021 and to reduce carbon emissions by 50 percent the same year, easily exceeding the state of Minnesota's goal of a 30 percent carbon reduction by 2025. In 2019, Minnesota Power had renewable energy assets of 522 MW of wind, 11 MW of solar, 55 MW of renewable biomass and 121 MW of hydro generation.

	Compared with 2005, we have increased our owned renewable generation assets by more than 500 MW.
Minnesota Municipal Power Agency ("MMPA")	
Stated Goal	**Comment**
100 percent renewable when economical.	MMPA has no coal in its portfolio. MMPA's renewable generation exceeded 20 percent of its load in 2019 and with its Walleye Wind PPA, renewable generation is projected to provide in excess of 40 percent of its load in 2022. MMPA also regularly exceeds the Minnesota state goals for carbon emissions reductions.
Minnkota Power Cooperative ("Minnkota")	
Stated Goal	**Comment**
Committed to finding opportunities to reduce carbon emissions while maintaining system reliability.	Minnkota's present electric generation capacity of 34 percent renewable and 8 percent hydroelectric resources provide a significant proportion of our energy portfolio that is non-CO2 emitting. Minnkota is also focused on development efforts for Project Tundra, which if constructed, would pioneer the effort to capture approximately 4 million tons of CO2 per year.
Missouri River Energy Services (including Hutchinson Utilities Commission and Marshall Municipal Utilities) ("MRES")	
Stated Goal	**Comment**
N/A	Creating a cleaner energy future is a top priority for MRES and our members, and we are delivering affordable, reliable, and ever-increasing clean energy to our members and their customers. Over the past 15 years, MRES has added renewable and carbon-free resources to our power supply mix, including nuclear, wind and solar resources. We are constructing a new clean, renewable, and reliable hydroelectric power plant near Pella, Iowa, that is scheduled to become operational in late 2020. And, MRES launched the Bright Energy Choices program on January 1, 2020, which allows members and their customers to choose 100 percent renewable or 100 percent carbon-free energy through the purchase of Renewable Energy Certificates to offset the portion of their power supply that comes from fossil fuels. MRES continues to evaluate opportunities for additional clean energy resources as part of the ongoing commitment of MRES to the environment, and to help MRES members meet state renewable energy objectives/standards. In our decisions, we have focused on environmental stewardship, along with reducing risk, and increasing reliability.

Northern States Power Company d/b/a Xcel Energy	
Stated Goal	**Comment**
Goal to reduce carbon emissions 80 percent by 2030, with a vision to provide 100 percent carbon-free electricity to customers by 2050.	Xcel Energy is the first major U.S. power company with an aspiration to provide 100 percent carbon-free electricity. We know that climate change is an urgent issue for many policymakers and investors and is a growing concern for our customers who look to Xcel Energy to act. It is a priority for us as well, and is the reason we set an ambitious interim goal to reduce carbon emissions 80 percent by 2030 from the electricity we provide customers and aim to deliver 100 percent carbon-free electricity by 2050.
Otter Tail Power Company ("OTP")	
Stated Goal	**Comment**
Project by 2022, customers will receive 30 percent of energy from renewables. Carbon emissions will be at least 30 percent below 2005 levels.	OTP plans to retire the Hoot Lake coal plant in 2021, replacing the capacity with the 150 MW Merricourt wind farm in North Dakota and the 245 MW Astoria simple-cycle natural gas combustion turbine in South Dakota. Astoria station will complement Merricourt and our other wind generation by providing a reliable backstop when the wind is not blowing and will have flexible operating options and low emissions. OTP's Integrated Resource Plan also contains a generic 30 MW solar facility as part of our 5-year action plan.
Rochester Public Utilities ("RPU")	
Stated Goal	**Comment**
100 percent renewable energy by 2030.	RPU will be redefining the energy mix used to supply RPU's customers by procuring new energy and capacity sources for 2030. As published in RPU's most recent resource plan, the RPU Board gave staff the direction to further pursue and investigate two options with 100 percent renewable energy. RPU is projected to procure the renewable energy from 50 MW of solar and 350 MW to 450 MW of wind, with capacity requirements being met from either 300 MW of battery storage or natural gas combustion turbines. The exact mix of wind, solar, and capacity resources will be determined at dates closer to 2030 based on available technologies and economics at that time. The mix of RPU ownership to PPAs will also be determined at a later date.
Southern Minnesota Municipal Power Agency ("SMMPA")	
Stated Goal	**Comment**
80 percent carbon free in 2030.	SMMPA plans to retire Sherco 3 and cease owning coal generation in 2030. In its place, SMMPA will be investing in significant levels of wind and solar (approximately 187 MW of each). This will allow SMMPA to reduce its carbon emissions by nearly 90 percent from 2005 levels, pushing our total generation fleet to 80 percent carbon free in 2030. To move beyond 80 percent, new technology and solutions will need to be designed, tested, and implemented.

	SMMPA is committed to exploring these new technologies, like storage, but we believe they should be deployed when cost-effectiveness can be maximized. With all that in mind, there will be a continued need for transmission investment for SMMPA to add the levels of solar and wind necessary to meet the 80 percent carbon free goal.

NEXT STEPS IN TRANSMISSION PLANNING

Transmission planning is done on a regional basis with the Midcontinent Independent System Operator ("MISO") performing the role as the Planning Authority. As the Planning Authority, MISO has developed several transmission planning processes to address generation interconnection needs, short-term reliability and market efficiency needs, and a long-term planning outlook.

Within the generation interconnection arena, MISO models and evaluates impacts of groups of generation interconnection requests to determine the transmission needed to allow these generators to have reliable access to the existing transmission grid. MISO also coordinates modeling processes with other interconnected transmission grids (e.g., SPP and PJM). Who builds and pays for the new transmission is identified in MISO's Tariff. The studies to identify these upgrades occur in three phases as part of an iterative process, where some generation in a study group may opt out of the process and remove its interconnection request based on internal business decisions after reviewing study results. The study process is repeated with the remaining group of generation interconnection requests at each phase of the study, and the analysis at each of the study's phases can potentially identify different transmission solutions for the projects at each study phase.

MISO provides two alternative approaches that leverage existing transmission by allowing new generation to take advantage of sharing the existing interconnection service granted to existing

system generation. MISO performs studies to determine if the new generation can use the existing transmission system when the existing generation is not operating at full capacity or has been retired.

The annual MISO Transmission Expansion Plan ("MTEP") looks to the reliability needs of the transmission system driven by either load growth and/or transmission congestion identifying reliability issues that must be corrected. Most transmission solutions tend to be local in nature with an occasional larger transmission backbone solution (typically 345 kV and above) being identified. The local transmission solutions are built by the local transmission owner and paid for by the local load serving entities connected to each local transmission system. Larger transmission solutions go through a rigorous analysis to determine benefits to the local grid as well as benefits to the region and who builds in Minnesota is either based on State Right of First Refusal or in the regional transmission organization's Transmission Owners Agreement. The entities that pay for these projects is determined based on the identification of benefits in this process.

In addition to the short-term analysis, MISO develops long-term economic models based on input from the MISO stakeholder community. This input includes load growth assumptions, changes to the generation fleet based on state policy objectives and utility resource plans. The results of these discussions are the assumptions built into these future models. Analysis is performed to determine if regional transmission projects can be identified and meet pre-determined benefit to cost ratios.

Each of these planning processes historically has met many of the needs of electric customers in the MISO region. A fundamental step change has begun to occur recently with many generation retirements being announced and replacement generation being called upon to provide the reliability attributes these retired generators have provided to the transmission grid. As these

generator retirements occur, the market, state policymakers and the public are creating pressure to transition to a less carbon intensity generation fleet.

A year ago, CapX2020[1] recognized that this rapid change was occurring and the challenges facing the transmission grid needed to be identified, so future transmission solutions to address the changes could be identified. While CapX2020 is a subset of the MTO members, the issues identified in the CapX2050 Transmission Vision Report[2] impact all MTO entities.

The report highlighted current trends in the arena of moving towards a reduced carbon generation fleet; the fundamentals of grid operation, including system stability, frequency response, system strength, and voltage regulation; and the ability to balance and ramp generation in response to changes in generation output and load. The report discussed past weather-related operating challenges and the need to address these situations with a generation fleet with a strong dependence on wind and solar resources. The report looked at the impact that generation retirements had on the North Shore transmission system and the need to invest in transmission to maintain system reliability as well as the technological advances needed to maintain system reliability.

The CapX2050 Transmission Vision Report was intended to educate and provide new insights identified in ongoing analysis being performed by individual CapX2020 planning efforts. The report highlighted many issues the transmission grid will be facing in the future, including:

- Dispatchable resources support the electric grid in ways that non-dispatchable resources presently cannot and therefore, some dispatchable resources will be necessary.

[1] CapX2020 member utilities include: Central Municipal Power Agency/Services, Dairyland Power Cooperative, Great River Energy, Minnesota Power, Missouri River Energy Services, Otter Tail Power Company, Rochester Public Utilities, Southern Minnesota Municipal Power Agency, WPPI Energy, and Xcel Energy.

[2] http://www.capx2020.com/documents/CapX2050_TransmissionVisionReport_FINAL.pdf

- The ability for system operators to meet real-time operational demands will be more challenging and, therefore, we will need to develop new tools and operating procedures to address the challenges.

- More transmission system infrastructure will be needed in the upper Midwest to accommodate the transition of resources.

- Non-dispatchable resources alone will be incapable of meeting all consumer energy requirements at all times and, therefore, we will need to understand and promote a future electric grid that can continue to meet consumer energy requirements safely, reliably and affordably.

While the report used the terms, "dispatchable and non-dispatchable," the issue is that the reliability attributes provided by existing generation need to be maintained as the generation fleet continues to transition. The ability to ramp and balance generation with load will need to be maintained, as well as stabilizing attributes of the existing coal-based generation needing to be available to the future transmission grid.

In May 2020, CapX2020 sent a letter to the MISO requesting that MISO initiate a comprehensive, long-term transmission planning analysis using an integrated approach to identify a plan to optimally meet the 2030 goals of utilities, their customers, and policymakers in the Upper Midwest. The letter supported the future assumptions MISO identified for use in their 2021 MTEP long-term planning initiative.

MISO kicked off this planning effort at the August 12, 2020 Planning Advisory Committee meeting. The CapX2020 planners and the planners from other MTO companies will be involved and support MISO's efforts with insights from our planning perspectives and provide feedback on their analysis. The goal is to identify transmission needs and solutions to meet the objectives of our individual companies and objectives of the state.

CONCLUSION

As noted in the table, the load serving entities have and continue to move towards utilizing a generation fleet that is clean. Those efforts involve looking at existing technologies as well as looking for new technologies to achieve a clean energy future. Each entity is focused on achieving a clean energy future that meets the goals of their customers. The MTO will include a full discussion and analysis of the gaps between the existing and currently planned transmission system and the transmission system that will be required to meet the companies' publicly-stated clean energy goals in the Minnesota Biennial Transmission Projects Report. This discussion will include an update on the solutions identified in the MTEP21 effort, MISO's generation interconnection process, and other MTO utility efforts. The transmission owners are looking towards MISO's MTEP21 effort to help guide the transmission development and will be engaged in that planning process.

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Respectfully submitted,

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