

**REPORT TO THE MINNESOTA LEGISLATURE
ON MINNESOTA'S ELECTRIC TRANSMISSION
SYSTEM – NOW AND INTO THE FUTURE**



**Submitted by
Minnesota Department of Commerce
Division of Energy Resources**

**In Consultation with
The Minnesota Public Utilities Commission**

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I. INTRODUCTION

Minnesota Statute § 216C.054, the Annual Transmission Adequacy Report to the Legislature,¹ requires the Commissioner of Commerce, in consultation with the Minnesota Public Utilities Commission, to prepare and submit this report annually to provide a nontechnical discussion of the “state” of Minnesota’s current electric transmission system. This law also requires a report on transmission planning and other actions taken or in process to maintain electric service reliability as well as comply with the requirements of the State’s Renewable Energy Standard.

Because transmission issues tend to involve numerous considerations and entities, this report provides a general discussion of transmission as a reference guide, similar to the discussion from previous reports. This report also provides an update of current transmission projects as identified in the recent biennial transmission report required by Minnesota transmission owners, along with a list of certificates of need for transmission lines filed in 2012.

II. WHY TRANSMISSION MATTERS: OVERVIEW

Electricity is provided to consumers via three main steps: generation (power plants), transmission and distribution. As the link between the production (generation) of electricity and delivery (distribution) to consumers, transmission plays a vital role in helping to ensure that consumers have low-cost, reliable energy. While it is a critical component in providing electric service, transmission accounts for a much smaller percent of utility costs than either generation or distribution facilities. For example, transmission may account for 10 percent of the costs of providing electric service while generation and distribution make up the other 90 percent.

Transmission facilities currently in place have been designed primarily to interconnect a utility’s generation and distribution facilities, and secondarily to interconnect neighboring utilities to each

¹ The statute states:

The commissioner of commerce, in consultation with the Public Utilities Commission, shall annually by January 15 submit a written report to the chairs and the ranking minority members of the legislative committees with primary jurisdiction over energy policy that contains a narrative describing what electric transmission infrastructure is needed within the state over the next 15 years and what specific progress is being made to meet that need. To the extent possible, the report must contain a description of specific transmission needs and the current status of proposals to address that need. The report must identify any barriers to meeting transmission infrastructure needs and make recommendations, including any legislation, that are necessary to overcome those barriers. The report must be based on the best available information and must describe what assumptions are made as the basis for the report. If the commissioner determines that there are difficulties in accurately assessing future transmission infrastructure needs, the commissioner shall explain those difficulties as part of the report. The commissioner is not required to conduct original research to support the report. The commissioner may utilize information the commissioner, the commission, and the Office of Energy Security [now known as the Division of Energy Resources] possess and utilize in carrying out their existing statutory duties related to the state's transmission infrastructure. The report must be in easily understood, nontechnical terms.

other to provide additional backup power. This design enables utilities to access other generation or transmission systems if something goes wrong on that utility's system. This interconnection with other electric systems provides a more reliable system overall than isolated systems and allows utilities to access lower cost power from other suppliers, or purchase power on a temporary basis rather than building a generation facility that may be used only intermittently. Transmission helps the entire system of interconnected utilities operate more efficiently than if each utility were operated on a stand-alone basis.

The interconnected transmission system is vast. Electrically, the transmission grid is split into three sections: the Eastern Interconnection, the Western Interconnection, and the Electric Reliability Council of Texas (ERCOT). These areas are shown in the map in Attachment A.²

Electricity follows the laws of physics: like water, it follows the path of least resistance. However, electricity has different properties that require different delivery systems than are used for water. For example, electricity placed onto the interconnected transmission grid could be withdrawn at any other place within the interconnection as long as there is no congestion. Moreover, the electrical system must be balanced, meaning that the amount of electricity being produced at any given time must essentially equal the amount of electricity being used by consumers. However, because electricity cannot be stored in a reasonable manner with current technology, the transmission system helps maintain this balance by allowing electricity to flow around the electrical system where possible.³

III. TRANSMISSION, RELIABILITY AND POWER COSTS

Adequate transmission is one essential component to ensure that Minnesotans have reliable and reasonably priced electric service. When there are shortages in transmission capacity in certain areas, there are more frequent power outages and lower power quality (which can affect sensitive equipment such as computers). Since Minnesotans depend heavily on reliable power in their homes and businesses, it is critical to ensure that electric service is as reliable as reasonably possible to minimize the cost to Minnesota's economy in lost production time and disruption and potential harm to the myriad systems that depend on electricity.

Another effect of inadequate transmission capacity is increased cost of power delivered on the system. When there is not enough transmission capacity, certain paths on the system become congested, causing operators of the electric system to decrease the amount of electricity

² Source and electronic link:

http://www.nerc.com/fileUploads/File/AboutNERC/maps/NERC_Interconnections_Color_072512.jpg

³ There are a number of technologies being developed to store un-needed electricity for later use. However, none of these technologies are commercially viable or operational at this time. One technology currently in use is known as "Pumped Hydro Power" which uses electricity at times when little power is being used for other purposes to pump large amounts of water into a reservoir. Later, when electricity is needed, this reservoir water is allowed to flow through a hydro-power turbine, generating electricity. This technology's use is restricted due to the need for a large amount of water to make it viable and the large facilities needed to store the water and generate the hydro-power. Currently, the largest Pumped-Hydro facility in the Eastern U.S. is located on the eastern shore of Lake Michigan. In addition, Northern States Power d/b/a Xcel Energy is testing use of a large battery facility to store power from wind energy for later use. Such batteries are still in the testing stage in the U.S.

produced by generators in those areas and increase generation in other areas to make up for the generation that could not be delivered from the congested areas. The entire electric system starts with the least-cost generators, adding power from generators that are increasingly expensive to operate. As a result, when transmission congestion causes adjustments to the generation facilities used to produce power, the cost of power goes up as more expensive generation replaces less expensive generation.

Both of these factors hurt Minnesota's economy. Lapses in power quality and reliability, along with higher costs, could potentially disrupt businesses, industries, hospitals, schools, public services and citizens who depend on computers and other electronics in their day-to-day lives and expect that power costs will be reasonable.

IV. ROLES OF ENTITIES INVOLVED IN TRANSMISSION

Numerous entities affect the design and cost of Minnesota's transmission system that serves Minnesota. While Minnesota's electric utilities are certainly involved in these matters, other entities are also involved. The following is a partial list of major players.

1. Because transmission lines located outside of Minnesota serve Minnesota customers, the utilities that own those facilities and states that regulate those utilities affect the cost and design of the transmission grid that serves Minnesotans.⁴
2. The Federal Energy Regulatory Commission (FERC)⁵ regulates the wholesale rates that utilities charge for transmission service and the type of transmission services provided.
3. The Midwest Independent System Operator (MISO) operates the regional transmission system covering 11 states and the Canadian province of Manitoba.^{6 7} FERC regulates MISO's rates.
4. The North American Electric Reliability Corporation (NERC) works with electric reliability councils and others to develop and enforce certain electric reliability standards of the transmission system as a whole.
5. The Midwest Reliability Organization (MRO), with members in six states⁸ and two Canadian Provinces (Manitoba and Saskatchewan), develops and ensures compliance with regional and international electric standards and performs assessments of the grid's ability to meet demands for electricity.
6. The Organization of MISO States (OMS) is a self-governing organization of representatives from each of the state regulatory commissions with authority over utilities or other entities participating in MISO. The OMS analyzes and makes

⁴ Similarly, the transmission grid physically located in Minnesota affects the electric service provided outside of Minnesota.

⁵ <http://www.ferc.gov/about/ferc-does.asp>

⁶ <http://www.midwestmarket.org/page/About%20Us>

⁷ Companies with transmission assets in Minnesota and membership in MISO include: ALLETE (Minnesota Power), Central Minnesota Municipal Power Agency, Dairyland Power Cooperative, Great River Energy, ITC Midwest, Missouri River Energy Services, Montana-Dakota Utilities, Northern States Power d/b/a Xcel Energy, Northwestern Wisconsin Electric Company, Otter Tail Power, and Southern Minnesota Municipal Power Agency.

⁸ Minnesota, Wisconsin, Iowa, North Dakota, Nebraska, nearly all of South Dakota.

recommendations to MISO, FERC, and other relevant government agencies regarding matters that affect regional transmission issues.⁹

7. The Minnesota Public Utilities Commission requires Minnesota utilities to develop sufficient transmission to serve load and regulates the amounts of costs that Minnesota's investor-owned utilities charge to their retail customers for transmission. While the Minnesota Commission does not regulate the wholesale rates that Minnesota's investor-owned utilities charge to wholesale customers, the Commission does ensure that these utilities allocate transmission costs appropriately at the retail level, considering facts pertaining to retail customers. The Minnesota Commission is also Minnesota's representative to the OMS.
8. The Division of Energy Resources of the Minnesota Department of Commerce investigates matters before the Commission and makes recommendations to address proposals by utilities and others. In addition, the Department participates in efforts by OMS and MISO.

Because it is so involved in the operations of Minnesota's electrical system, MISO warrants further discussion. As noted above, MISO is a Regional Transmission Organization created and regulated by FERC. It is involved in numerous matters that are critical to the reliable and low-cost operation of the transmission system, including planning for contingencies if large generation plants or transmission components fail, conducting engineering analyses of the effects of changes in generation or transmission components on the system as a whole, planning for the transmission needs in the MISO region,¹⁰ coordinating with other areas of the Eastern Interconnection System, monitoring the day-to-day (and minute-to-minute) operations of the transmission system, operating the system to call on the lowest cost generation facilities to operate, operating the system to address the effects of congestion on the transmission system, analyzing where the greatest congestion exists and so forth. The Department and Commission Staff participate in various MISO and OMS committees.

V. DETERMINING HOW MUCH TRANSMISSION IS ENOUGH

A. MINNESOTA'S TRANSMISSION SYSTEM

When the majority of Minnesota's current transmission system was built, largely 30 to 70 years ago, items such as home computers, video games, cable TV, and cell phones were unheard of, few customers had air conditioners, and there were few plug-in appliances. Most transmission facilities that exist today were sized to meet the then-current electricity needs of the population and economy of the day plus some assumptions for growth based on what was known at that time. For example, facilities built in the 1940s were first sized to meet the demands of that era – electric lights to small houses, street or yard lights, plus power to radios, a few kitchen appliances and that new innovation, the television, and secondarily sized to meet needs

⁹ At the time of this report a MISO proposal is pending at FERC, as part of its compliance filing under FERC Order 1000, that would enhance the role of state regulatory commissions in the MISO transmission planning process beyond being purely advisory in nature. Action by FERC on the MISO proposal is expected in 2013.

¹⁰ At the time of this report there are filings pending before the FERC to allow Entergy Corporation (with operations in Arkansas, Mississippi, Texas, Louisiana, and the City of New Orleans) to join MISO.

forecasted in the coming decade or so. Facilities built during the late 1970s and early 1980s were sized to provide (to a much larger population) electric lights to larger houses, street, traffic and (rural) yard lights, electric heating (during the “energy crisis” of the late 1970s), radios, stereos and televisions, clothes washers and dryers, major and small kitchen appliances including microwave ovens. Again, they were also sized so that the system could meet needs well into the future. However, the future-needs sizing at that time was primarily designed to make room for more consumers; it was certainly not known at that time that households would have home computers and the myriad other ways to use electricity in their homes and businesses which Minnesotans now enjoy.

While Minnesota’s transmission system was previously built with more capacity than was immediately needed, Minnesota has been outgrowing its system, and the system has been aging. By the late 1990s, new housing continued to grow larger, households commonly had multiple televisions along with all of the other electric devices, and personal computers were readily available and in day-to-day use. And today, in addition to all of the items listed before, Minnesotans now have a tremendous number of new appliances that are using electricity twenty-four hours a day – for example, cable television converter boxes, DVRs, clocks, and gaming systems left plugged in. In addition, the number of computers used in a household and the size of televisions have negated some of the efficiency increases gained in refrigerators, dishwashers, and water heating. Finally, the number of devices requiring charging – cell phones, laptop computers, and portable music devices – has exploded. Use of electricity to power vehicles looms on the horizon as yet another way to use electricity, likely creating more demand on the electric grid.

More transmission has been added and more is expected to be needed. Moreover, Minnesota customers and industry need not only electricity, but also acceptable power quality, meaning evenly delivered power without power surges and other fluctuations that can impact computers and other sensitive electronic devices. Lack of sufficient space or capacity on the grid also means that there could be some locations in the state where power quality may soon become unacceptable. Further, in some Minnesota locations too much electricity is trying to flow on the lines causing “grid lock,” and reliability problems in making sure the power can be delivered where it is needed.

Determining the amount of transmission infrastructure needed requires balancing the risks of building too much transmission or too little. However, these risks are not symmetrical. If more transmission capacity is built than needed to provide delivery service for available generation resources, the system will be relatively free of transmission constraints, but will cost more than is necessary to provide adequate service. However, if too little capacity is built for delivery service from existing generation resources, the transmission cost component of providing electricity service may be lower, but the overall costs to Minnesota’s economy of the less reliable power that would result may be far greater than the cost of building transmission. As noted above, these costs of a less reliable electric system may include lost productivity, damage to security systems, damage to computer systems, and increased cost of producing electricity.

In addition, as suggested by the foregoing, well-designed transmission systems help to use generation resources more efficiently. Having a transmission system or “grid” that covers a

broader region and multiple utilities, with access to a larger portfolio of generation resources, permits strategic use of the most efficient generation resources available on the grid at any given moment. Regional transmission planning and operations help to mitigate potential inefficiencies from a balkanized utility grid based on individual utility service territories.

As a result, it is important to plan to meet not only the expected demand for power but also the demand for relatively high amounts of power along with growth in the demand for power over at least the number of years that it takes to build new transmission lines, from planning, through engineering analysis, working with landowners and erecting the lines.¹¹

Distributed generation also has a role in ensuring reliable power, particularly when such resources are relatively low cost and are located in areas where such resources can address congestion on the transmission system.

The goal is to have a system that is ready to handle the demand for power and allow for growth in the economy. If the transmission system were planned assuming that demand for power during a recessionary period would continue in the future, the transmission system would be unable to accommodate recovery and growth in the economy. Even if the transmission system were planned only to meet the demand for power during a reasonably healthy point in the business cycle, the transmission system could not accommodate a boom period in the economy. Moreover, if plans for transmission ignore growth in the economy and the demand for power over time, let alone for any expected new uses of electricity for applications that may not yet exist, then the transmission system may not be adequate in the future.

The Commission recognized these concepts in its May 22, 2009 Order in the certificate of need proceeding for the transmission capacity expansion project for 2020, or CAPX 2020:

The fact that demand is less than forecast reflects a variety of factors, including both the current recession and abnormally cold weather. In evaluating the demand for facilities that are expected to last decades, however, the Commission must focus not on current levels of demand – reflecting fluctuations in the economy and weather - but rather on long-term trends.¹²

The Minnesota Court of Appeals affirmed the Commission's decision on June 8, 2010.

Thus, even though Minnesota is still recovering from the recent recession, once the economy recovers it will be necessary to ensure that the transmission system is ready to meet those needs. Prior to the recession, Minnesota's transmission grid was operating close to its limits with small amounts of unused space on the grid available in some locations to accept new power sources. Fortunately, work has begun to build significant transmission lines that the Minnesota Commission approved for use throughout Minnesota in the CAPX 2020 proceeding noted above. These transmission lines and other facilities (substations, etc.) will help ensure that power is

¹¹ Utilities have demand-side management tools to reduce demand on the system at peak times.

¹² Minnesota Public Utilities Commission's May 22, 2009 Order in Docket No. E017, et. al./CN-06-1115, page 11.

delivered reliably and allow new generation facilities of significant size to connect to these areas of the transmission grid in the future.

Minnesota largely avoided serious problems with its transmission system due to having one of the strongest energy conservation programs in the country.¹³ Minnesota's Conservation Improvement Program has, since its inception, conserved enough energy to push back by many years the need for building multiple major electric generation plants by offering industry, business and residents various programs to save energy in their day-to-day operations. As a consequence, while power usage continued to increase due to finding more ways to use electricity in our homes and businesses, the increases were smaller in the 1980s and 1990s than the increases experienced in the 1970s. However, these programs cannot put off addition to transmission indefinitely, particularly when more transmission is needed to accommodate new generation, as discussed below.

B. FEDERAL ACTIONS IMPACTING MINNESOTA'S TRANSMISSION GRID IN 2012

Additions to transmission are needed not only due to factors in Minnesota, but also due to federal and regional governmental actions directly impacting the use of Minnesota's transmission grid (as well as other states' grids). The 2012 report listed historical developments that have affected Minnesota; the current report discusses several issues with potential effects on Minnesota.

During 2012, several regional or federal issues have affected Minnesota or have the potential to affect Minnesota. This report does not list all of these issues, but the following discusses a few issues briefly.

Multi-Value Transmission Projects: MISO categorizes transmission projects based on their primary purpose: those designed primarily to address reliability issues (Reliability); those designed to offer low cost power into the market (Economic); and those designed to provide generators access to the MISO grid (Generator Interconnection). A project's category determines how its costs are allocated under MISO tariffs. Since the last report, MISO has added a fourth category for projects that address public policy issues, i.e., Multi-Value Transmission Projects. By definition, these are transmission projects with far-reaching effects that merit consideration of costs and benefits beyond one or two entities to a regional scope. When such projects are found to provide value in excess of their costs under a variety of future policy and economic conditions, then the projects may qualify as multi-value projects and their costs are spread more broadly across the entire MISO footprint. For example, Minnesota's Brookings line was approved as a multi-value project. While MISO's MVP tariff filing is in the courts, it is expected that the concept of multi-value projects will continue.

MISO's Planning Reserve Zones: In 2012, MISO proposed new planning reserve areas, as shown in Attachment B to this report. The geographical area of MISO's region spans numerous states. To reflect that it is not possible for electric power to be delivered from any point to any within this vast area, MISO proposed "planning reserve zones" to allow focus in each region on

¹³ The 2007 Minnesota Legislature greatly strengthened the State's conservation efforts with the passage of the Next Generation Energy Act. Minnesota Statutes section 216B.242 now require utilities to set a goal of achieving energy savings equivalent to 1.5 percent of retail sales each year.

ensuring that there are adequate electric resources to meet the needs in each zone. Importing power across zones is more expensive than within a zone due to costs to transmit power.

Minnesota is part of Planning Reserve Zone 1, along with the western half of Wisconsin, all of North Dakota, and portions of Montana, South Dakota, and Illinois. Utilities included in Zone 1 are Dairyland Power Cooperative, Great River Energy, Montana-Dakota Utilities, Minnesota Power, Northern States Power, Otter Tail Power and the Southern Minnesota Municipal Power Agency.

Minnesota's Right of First Refusal: In 2011, FERC issued Order 1000, which changed the procedures for building new transmission by taking away incumbent utilities' long-standing federal right of first refusal to build new transmission lines approved for construction in incumbent utility service areas. FERC did so claiming that the federal right of first refusal had become anti-competitive. However, FERC did not require any competitive bidding or further vetting as to which entity would build new transmission lines. FERC's overall goal in Order 1000 and other policies was to encourage utilities to build more transmission.

Fortunately, FERC was careful not to tread on the rights of states to establish rights of first refusal regarding transmission. Minnesota utilities have long been ahead of the curve in sharing information to build cost-effective transmission lines. There were significant concerns that FERC's Order 1000 may discourage utilities from sharing information since another entity could step in and build any needed transmission lines. There were also concerns that FERC's Order 1000 could lead to higher cost transmission lines due to incentives FERC previously granted for building new transmission lines.

To ensure that Minnesota's history of building transmission lines when such lines are needed and only if they are needed, and that such lines are built in a cost-effective manner, in 2012 Minnesota passed Minnesota Statute Section 216B.246, Federally Approved Transmission Lines; Incumbent Transmission Lineowner Rights.¹⁴ This law established Minnesota's right of first refusal to incumbent utilities to build transmission lines, but also required such utilities either to build the transmission lines approved in the MISO process or explain to the satisfaction of the Minnesota Public Utilities Commission why such lines should not be built. As discussed in Attachment C to this report, this new statute works in conjunction with Minnesota's existing statutes to ensure that Minnesota utilities provide reliable service, at reasonable costs, in consideration of Minnesota's policy objectives.

¹⁴ As discussed in the 2012 version of this transmission report, North Dakota and South Dakota previously passed laws addressing state right-of-first-refusal laws in each state in similar but different ways. Please see the Attachment of the 2012 Transmission Report for the specific legislation in the two states.

VI. MINNESOTA'S TRANSMISSION SYSTEM – PLANNING FOR THE FUTURE

A. BIENNIAL TRANSMISSION REPORT

Minnesota Statute section 216B.2425 requires utilities that own or operate electric transmission facilities in the state to report by November 1 of each odd-numbered year on the status of the transmission system, including present and foreseeable inadequacies and proposed solutions.

The utilities listed below jointly issued a biennial transmission report on November 1, 2011. Because the next report is not due until November 1, 2013, this Transmission Report includes the same information on this point as was provided in the 2012 Transmission Report.

Utilities that jointly filed a biennial transmission report on November 1, 2011:

- American Transmission Company, LLC
- Dairyland Power Cooperative
- East River Electric Power Cooperative
- Great River Energy
- Hutchinson Utilities Commission
- ITC Midwest LLC
- L&O Power Cooperative
- Marshall Municipal Utilities
- Minnesota Power
- Minnkota Power Cooperative
- Missouri River Energy Services
- Northern States Power Company d/b/a Xcel Energy
- Otter Tail Power Company
- Rochester Public Utilities
- Southern Minnesota Municipal Power Agency
- Willmar Municipal Utilities

These utilities also jointly maintain the following website providing information about transmission planning and projects: <http://www.minnelectrans.com>

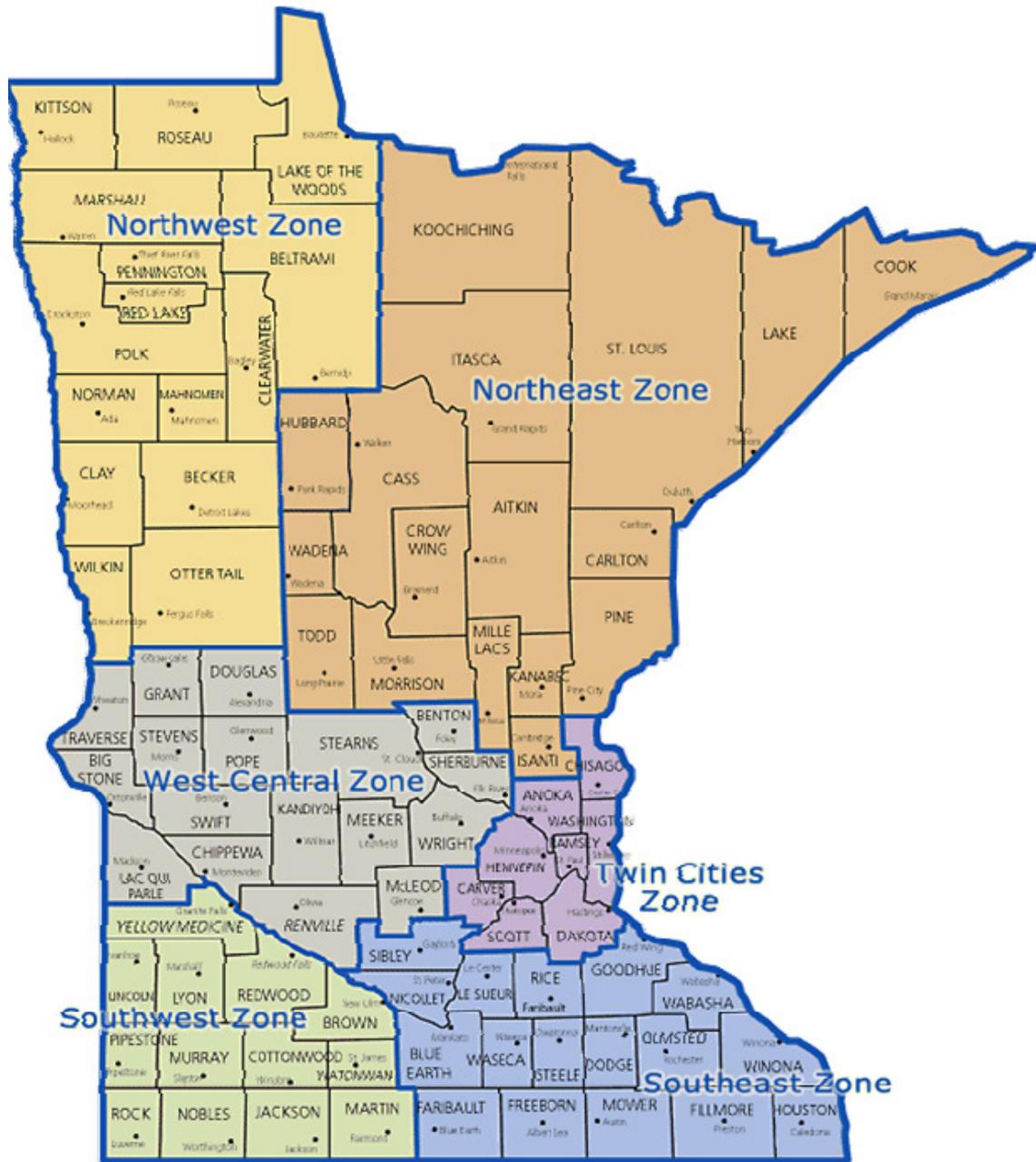
The 2011 Biennial Transmission Report indicated that Xcel, Minnesota Power and ITC Midwest had plans to file certificates of need for new transmission lines. As indicated below, all of these entities, plus Great River Energy, filed new certificates of need in 2012:

Name and Description of Proposed Transmission Project	Name of Utility
115 kV Transmission Line Project in the Elko New Market and Cleary Lake Areas in Scott and Rice Counties, Minnesota (approximately 19 miles total)	Great River Energy
Great Northern Transmission Line 500 kV line between Manitoba, Canada and the Blackberry Substation (225 to 300 miles), and a 345 kV double circuit line between Blackberry and the Arrowhead Substation near Hermantown in St. Louis County, Minnesota (approximately 50 to 70 miles)	Minnesota Power
345 kV crossing the Minnesota-Iowa border in Jackson, Martin, and Faribault Counties, Minnesota (approximately 75 miles)	ITC Midwest
115 KV line in Plymouth and Medina, Hennepin County, Minnesota (8.8 miles)	Northern States Power d/b/a Xcel Energy

Detailed information (including maps) on all transmission actions is broken down into six geographic zones of the state: Northeast, Northwest, West Central, Twin Cities, Southwest and Southeast. The transmission-owning utilities operating in six geographical zones put that zone's report together. The six zones in the state are shown in the map below.

The transmission owning utilities in each region are:

1. Northwest Zone – Great River Energy, Minnkota Power Cooperative, Missouri River Energy Services, Otter Tail Power company and Xcel Energy
2. Northeast Zone – American Transmission Company, LLC, Great River Energy, Minnesota Power and Xcel Energy
3. West Central Zone – Great River Energy, Hutchinson Utilities Commission, Missouri River Energy Services, Otter Tail Power Company, Willmar Municipal Utilities and Xcel Energy
4. Twin Cities Zone – Great River Energy and Xcel Energy
5. Southwest Zone – ITC Midwest LLC, East River Electric Power Cooperative, Great River Energy, L&O Power Cooperative (headquartered in Iowa), Marshall Municipal Utilities, Missouri River Energy Services, Otter Tail Power Company and Xcel Energy
6. Southeast Zone – Dairyland Power Cooperative, Great River Energy, ITC Midwest LLC, Rochester Public Utilities, Southern Minnesota Municipal Power Agency and Xcel Energy



Although most of the smaller transmission fixes are planned for the years 2011-2016, some information on transmission upgrades planned for 2020-2026 is included along with pertinent assumptions and other data on the needs and timing of these longer-range projects. In addition, the Minnesota transmission owners are actively participating in the longer-range regional transmission planning efforts currently underway, which should inform their own Minnesota longer-range planning efforts in the future.

B. RENEWABLE ENERGY STANDARD TRANSMISSION STUDY

In addition to reporting on transmission in general, utilities are also required to estimate how many megawatts of renewable generating capacity they will require beyond what is presently available to meet an upcoming milestone of the Minnesota Renewable Energy Standard (RES). Based on information filed in June 2012, utilities are in compliance with present RES standards through 2011 and expect to have enough renewable generation and transmission to meet increased future RES milestones.¹⁵ Thus it appears that no significant additional transmission investment is required for the RES in the near future. However, there may be a need for new transmission by 2020. The next report on the need for new transmission to meet the RES is due on November 1, 2013.

VII. CHALLENGES TO TRANSMISSION PLANNING –POTENTIAL IMPACTS TO MINNESOTA

A. NEW TRANSMISSION PROJECTS RAISE CONCERNS ABOUT LAND USE AND LAND RIGHTS

Recently, a number of energy entities, including natural gas pipelines, electric utilities, and ethanol plants, have sought approval to construct new energy projects in Minnesota. Since the siting process in Minnesota mandates a number of public meetings and hearings as well as other outreach efforts to potentially impacted residents and landowners, the laws and issues regarding land rights and land use are also receiving close scrutiny. In addition to wanting to know what benefit their area of the State would derive from the project, landowners and other impacted citizens naturally want to know what their rights are regarding such projects impacting their land so they may be assured that their rights are not infringed upon during the process.

To date, answers to impacted citizens and landowners have been identified during the regulatory processes. The answer to “what benefit does this project have for my area or my State” is a key question that is addressed in the State’s Certificate of Need process (Minn. Stat. § 216B.243) and land rights questions are addressed in various parts of Minnesota’s statutes. However, the questions may become harder to answer if large regional or national transmission projects come to fruition as a result of regional and national planning efforts noted in this report. Also, issues surrounding land rights and land use may be affected as to whether future projects continue under state jurisdiction or are preempted by the federal government.

¹⁵ Ongoing progress by utilities is monitored in several venues, including separate biennial reports to the Legislature on this issue.

To help stakeholders understand facility permitting proceedings before the Minnesota Public Utilities Commission that affect them and to help them have more productive input into those proceedings, the Commission recently created the specially designated position of Public Advisor. This position is responsible for designing and implementing a program to better inform stakeholders and to advise them on how to have a meaningful voice in the permitting process.

B. COST RESPONSIBILITY FOR MITIGATIONS

As utilities build more energy infrastructure, state regulators need to ensure that utilities use cost discipline as they construct new resources. To encourage cost discipline and prevent ratepayers from paying more than is reasonable for new utility infrastructure, at a minimum, a utility must justify any cost recovery above the amount the utility originally indicated that the project would cost. This focus on cost discipline is important since decisions to approve or deny a project are often based on cost estimates. Consequently, it is important to minimize errors in estimation to avoid ill-informed decisions from being made that would result in higher system costs than necessary.

When utilities install infrastructure in an area, there are always mitigation measures employed to address local concerns. Thus, it is important to ensure that decisions made by a utility on behalf of local governments reasonably consider the cost implications noted above. Further, it is important that costs of any significant upgrades are equitably allocated to ratepayers, based on ratemaking principles such as cost-causation, cost minimization and administrative feasibility. Discussions about such issues are likely to occur in the future.

C. FEDERAL VS. STATE JURISDICTION OVER TRANSMISSION SITING AND CONSTRUCTION AND THE THREAT OF FEDERAL PREEMPTION

The federal government “opened up” the interstate electric transmission grid in the 1990s. Certain eastern States challenged the federal government’s jurisdiction over interstate electric transmission lines.¹⁶ The challenge went to the U.S. Supreme Court which upheld that FERC has legal and regulatory jurisdiction over electric lines used for interstate commerce (States retain jurisdiction over small power lines that distribute power directly to retail electric customers.) After the Supreme Court reached its verdict, FERC issued a policy statement saying that it would not “preempt” state regulation of transmission lines as long as transmission service is not detrimentally impacted by state actions. However, when the federal approach of one-size-fits-all has not worked for Minnesota, the Department and Commission have advocated for the interests of Minnesota.

Also, in the 2000s, Congress stepped up federal jurisdiction over electric transmission lines in a slightly different way by enacting a law that provides the Department of Energy with the ability to designate “energy corridors” across states which would mean, among other things, that any transmission siting within a designated energy corridor would automatically go through federal, versus state, siting processes. Wind developers and states to the west of Minnesota, with an eye to selling electricity to eastern markets, proposed to the Department of Energy that it designate energy corridors across Minnesota. The Department of Energy did not take such designation

¹⁶ See *New York, et al. v. FERC, et al. and Enron Power Marketing, Inc. v. FERC* for further details.

actions but left the door open for later designations. Overall, the Department of Energy has not been particularly active in terms of naming many new corridors. Instead, the Department of Energy provided federal grants to the States and regional grid operators to engage and collaborate in transmission planning across the U.S.¹⁷

D. ALLOCATING THE COSTS OF NEW TRANSMISSION PROJECTS POSES MAJOR CHALLENGES

In every business transaction, some of the bottom-line questions are, naturally, “Who will use it or benefit from it and how much will it cost?” From the answers to those questions, the logical next step is to look to charging the cost of “it” to those who use it or benefit from it. What seems like a fairly straight-forward concept is anything but straight forward when the “it” in question is a package of large interstate, interconnected transmission lines costing billions of dollars. The “how much will it cost” question may be answered, but the “who will use it or benefit from it” question becomes elusive, albeit important, because of the myriad uses and benefits to different parties that any new transmission line can provide, given the integrated nature of the grid and the need to balance on a moment-to-moment basis between the amount of electricity delivered to the system and the amount used.

Deciding who pays for transmission is one of the largest challenges facing the states, utilities and the grid operator, which in turn affects all those who use electricity. Not only are the answers difficult to find, but even more so, whatever answers are found are not agreed to by all parties. The controversy in these questions is probably the core challenge facing all of the regional and national planning processes discussed below. It is one of the factors prompting the expanded role of state commissions in MISO transmission planning process, mentioned above. It also is a core challenge for project proposers because transmission proposers and investors are reluctant to move forward with transmission construction until they have answers on how they will be able to recoup their investment from those who use or benefit from the new project.

VIII. FEDERAL LAW AND POLICY DEVELOPMENTS EXPECTED TO IMPACT STATE, REGIONAL AND NATIONAL GENERATION AND TRANSMISSION PLANNING AND MINNESOTA

The Environmental Protection Agency has been revising several rules regarding operations of electric power plants; the changes have effective dates as early as 2016. While these rule changes pertain to power plants rather than transmission facilities, the changes are expected to have significant effects on the configuration of the existing integrated electrical system. For example, decisions that utilities make regarding power plants in states such as Wisconsin, Indiana, Michigan, or Illinois could increase energy costs in Minnesota or require more electric transmission and/or generation to be built. Because each utility needs to study its own system and assess the plans of neighboring utilities, it will be difficult to know with certainty how each utility will respond. MISO has been using voluntary surveys to obtain information from utilities in its region.

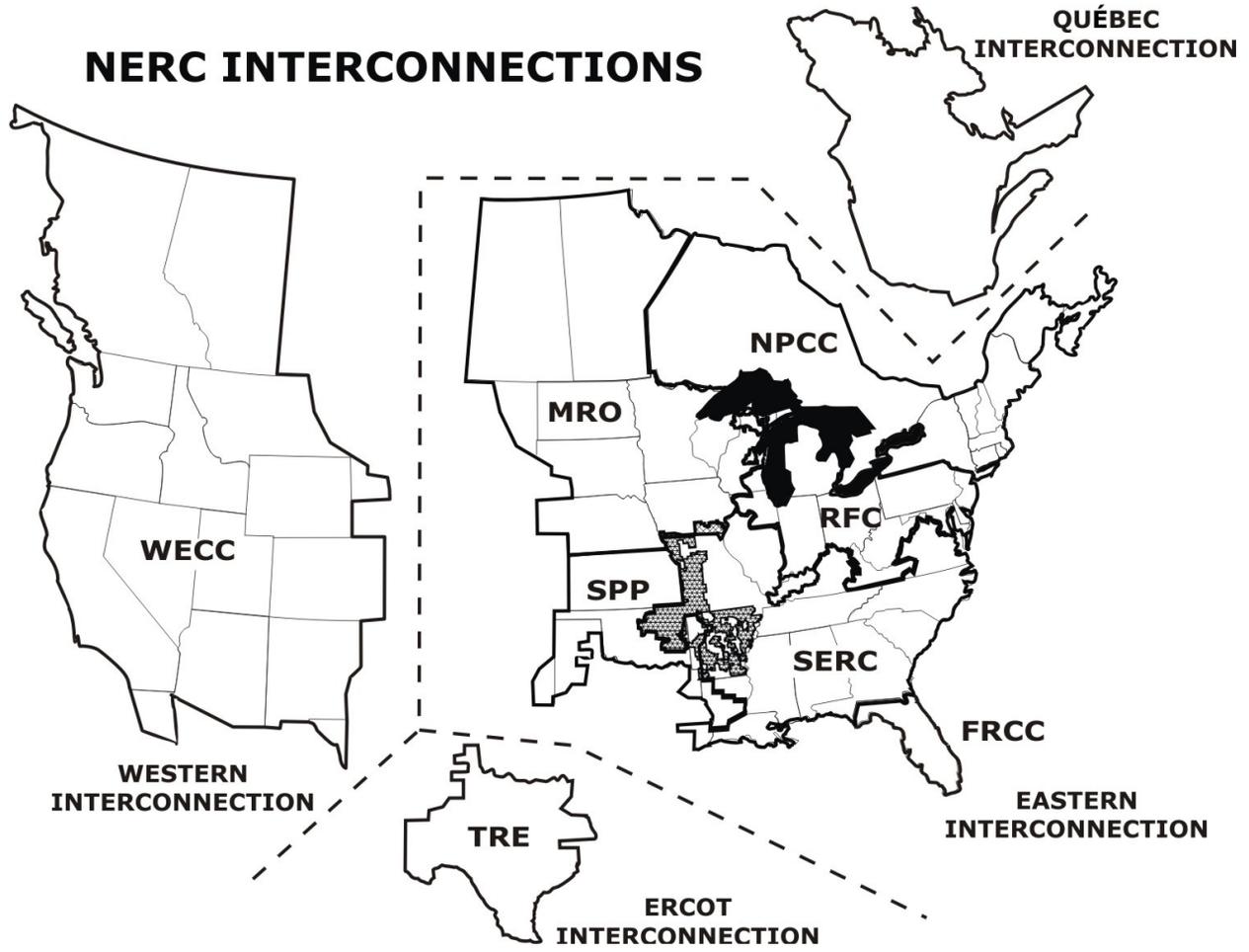
¹⁷ Further discussion on these efforts is discussed in the section entitled “National Transmission Planning Including and Impacting Minnesota.”

IX. SUMMARY AND CONCLUSIONS

In summary:

- Electricity has become increasingly important in Minnesota homes and businesses.
- Minnesotans and the economy depend on reliable power every day.
- A Regional Transmission Organization (i.e., MISO) operates the electric transmission system in Minnesota and surrounding states to achieve regional coordination and efficiency.
- Even though we are using the transmission system in a highly efficient manner, our use of electricity has strained the transmission grid, which was not designed for the purposes for which it is currently being used and expected to be used in the future as we find more ways to use electricity.
- Because we have outgrown our aging transmission system and because we need highly dependable electricity for computers and other sensitive equipment in our homes and businesses, it is necessary to upgrade and enhance our transmission infrastructure.
- The way that we build transmission is affected by state and federal policies, rules and laws facilitating the construction of certain types of generation and transmission and restricting other types of electricity and transmission in the state, region and across the United States.
- Minnesota has been and will be involved in numerous regional and national efforts to ensure that electricity transmission is planned in a reasonable and cost-effective manner for the State's economic future and the needs of its businesses and citizens.

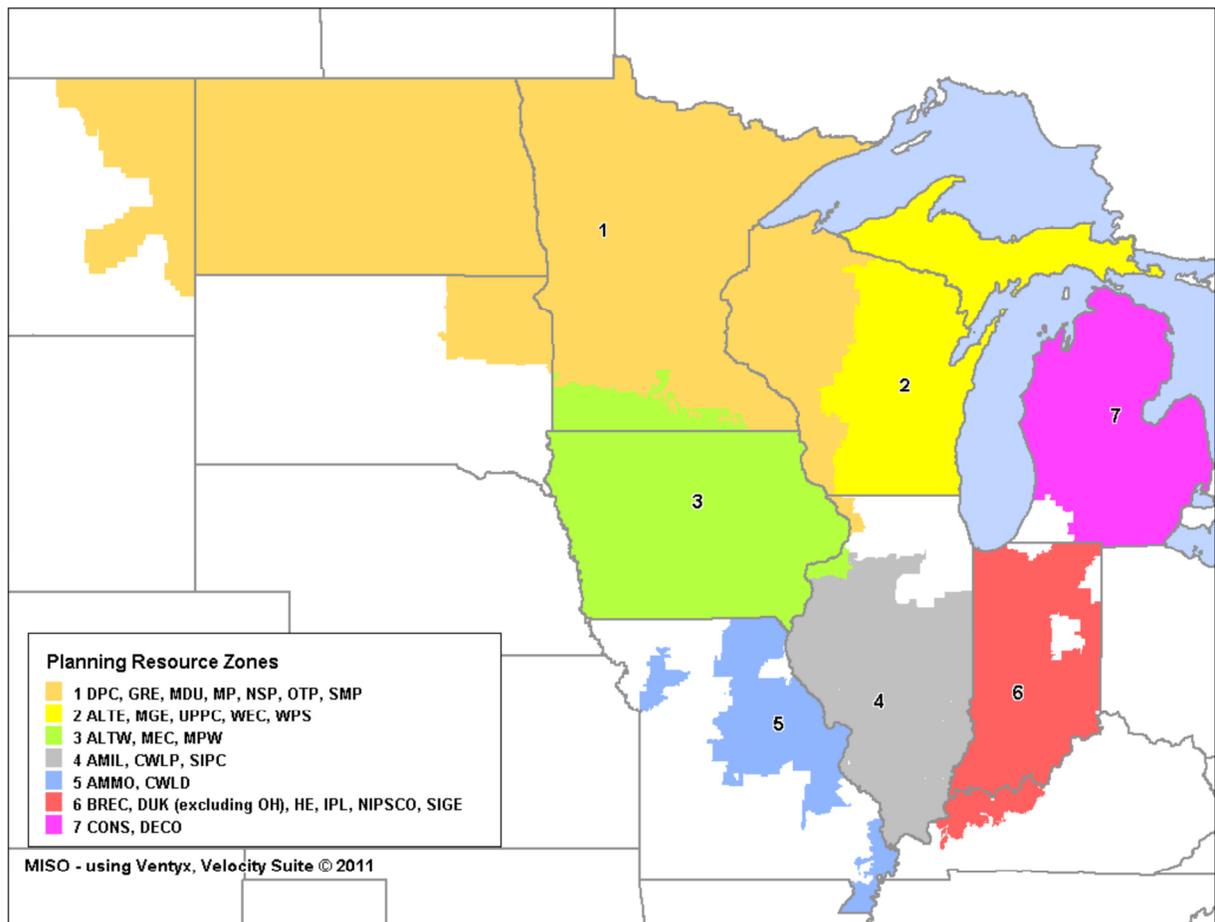
ATTACHMENT A: MAP OF REGIONAL RELIABILITY AREAS



Source: North American Electric Reliability Corporation

APPENDIX B: MISO's PROPOSED RESOURCE PLANNING ZONES

The geographical area of MISO's region spans numerous states. To reflect that it is not possible for electric power to be delivered from any point to any within this vast area, MISO proposed "planning reserve zones" to focus each region on the need to ensure that there are adequate electric resources to meet the needs in each zone. Minnesota is part of Planning Reserve Zone 1, along with the western half of Wisconsin, all of North Dakota, and portions of Montana, South Dakota, and Illinois. Utilities included in Zone 1 are Dairyland Power Cooperative, Great River Energy, Montana-Dakota Utilities, Minnesota Power, Northern States Power, Otter Tail Power and the Southern Minnesota Municipal Power Agency.



Source: The Midwest Independent System Operator

ATTACHMENT C: MINNESOTA'S RIGHT OF FIRST REFUSAL FOR NEW TRANSMISSION LINES

216B.246 FEDERALLY APPROVED TRANSMISSION LINES; INCUMBENT TRANSMISSION LINEOWNER RIGHTS.

Subdivision 1. Definitions.

(a) For purposes of this section, the terms defined in this subdivision have the meanings given them.

(b) "Electric transmission line" means a high-voltage transmission line with a capacity of 100 kilovolts or more and associated transmission facilities.

(c) "Incumbent electric transmission owner" means any public utility that owns, operates, and maintains an electric transmission line in this state; any generation and transmission cooperative electric association; any municipal power agency; any power district; any municipal utility; or any transmission company as defined under section [216B.02, subdivision 10](#).

Subd. 2. Incumbent electric transmission owner rights.

An incumbent electric transmission owner has the right to construct, own, and maintain an electric transmission line that has been approved for construction in a federally registered planning authority transmission plan and connects to facilities owned by that incumbent electric transmission owner. The right to construct, own, and maintain an electric transmission line that connects to facilities owned by two or more incumbent electric transmission owners belongs individually and proportionally to each incumbent electric transmission owner, unless otherwise agreed upon in writing. This section does not limit the right of any incumbent electric transmission owner to construct, own, and maintain any transmission equipment or facilities that have a capacity of less than 100 kilovolts.

Subd. 3. Commission procedure.

(a) If an electric transmission line has been approved for construction in a federally registered planning authority transmission plan, the incumbent electric transmission owner, or owners if there is more than one owner, shall give notice to the commission, in writing, within 90 days of approval, regarding its intent to construct, own, and maintain the electric transmission line. If an incumbent electric transmission owner gives notice of intent to build the electric transmission line then, unless exempt from the requirements of section [216B.243](#), within 18 months from the date of the notice described in this paragraph or such longer time approved by the commission, the incumbent electric transmission owner shall file an application for a certificate of need under section [216B.243](#) or certification under section [216B.2425](#).

(b) If the incumbent electric transmission owner indicates that it does not intend to build the transmission line, such notice shall fully explain the basis for that decision. If the incumbent electric transmission owner, or owners, gives notice of intent not to build the electric transmission line, then the commission may determine whether the incumbent electric transmission owner or other entity will build the electric transmission line, taking into consideration issues such as cost, efficiency, reliability, and other factors identified in this chapter.

History: [2012 c 179 s 1](#)

OUTLINE OF PROCESS FOR MINNESOTA'S RIGHT OF FIRST REFUSAL

The following outlines how Minnesota's right-of-first-refusal law works, subsequent to completion of the regional transmission planning process of the Midwest Independent System Operator (MISO).

1. MISO approves its Transmission Expansion Plan.
2. Incumbent utility gives notice to the Minnesota Public Utilities Commission (Commission), within 90 days of MISO's approval of the regional transmission expansion plan, of the utility's intent to build or not build any transmission lines in the utility's service area and the timing of any such new facilities.
 - a. If utility indicates intent to build and indicates that it will file a certificate of need within 18 months, go to step 3.
 - b. If utility indicates it will not build or will not file a certificate of need within 18 months, go to step 4.
3. Utility files certificate of need within 18 months of providing notice to the Commission. Go to step 5.
4. The Commission assesses the information provided by the utility to decide whether it is necessary for the facility to be constructed at that time.
 - a. If the Commission agrees with the utility that the facility is not needed at that time, the process ends. Such a decision could result in requiring the utility to revisit the question of need later.
 - b. If the Commission concludes that the facility is needed at that time, the Commission can use its authority under MN Stat. §216B.79 to require the facility to be built. Go to step 5.
5. Commission decides whether or not the facility is needed, based on the usual criteria in MN Stat. §216B.243, including cost and other considerations.

MINNESOTA STATUTES RELATED TO MINNESOTA'S RIGHT OF FIRST REFUSAL

The following statutes are related to Minnesota's right of first refusal (ROFR) law, passed in 2012. The statutes require Minnesota utilities to provide reliable service (MN Stat. §216B.04) at reasonable rates (MN Stat. §216B.03). Further, to ensure that utilities provide reliable service, Minnesota statutes give the Commission the authority to require utilities to build more energy infrastructure service (MN Stat. §216B.79). Finally, to ensure both that energy resources are needed and least cost, Minnesota Statutes require that all large energy facilities must have a certificate of need (MN Stat. §216B.243, subd. 2), in which the Commission must consider alternatives to meeting the proposed need (MN Stat. §216B.243, subd. 3).

216B.03 REASONABLE RATE.

Every rate made, demanded, or received by any public utility, or by any two or more public utilities jointly, shall be just and reasonable. Rates shall not be unreasonably preferential, unreasonably prejudicial, or discriminatory, but shall be sufficient, equitable, and consistent in application to a class of consumers. To the maximum reasonable extent, the commission shall set rates to encourage energy conservation and renewable energy use and to further the goals of sections [216B.164](#), [216B.241](#), and [216C.05](#). Any doubt as to reasonableness should be resolved in favor of the consumer. For rate-making purposes a public utility may treat two or more municipalities served by it as a single class wherever the populations are comparable in size or the conditions of service are similar.

216B.04 STANDARD OF SERVICE.

Every public utility shall furnish safe, adequate, efficient, and reasonable service; provided that service shall be deemed adequate if made so within 90 days after a person requests service. Upon application by a public utility, and for good cause shown, the commission may extend the period for not to exceed another 90 days.

216B.79 PREVENTATIVE MAINTENANCE.

The commission may order public utilities to make adequate infrastructure investments and undertake sufficient preventative maintenance with regard to generation, transmission, and distribution facilities. The commission's authority under this section also applies to any transmission company that owns or operates electric transmission lines in Minnesota.

216B.243 CERTIFICATE OF NEED FOR LARGE ENERGY FACILITY.

Subd. 1. Assessment of need criteria.

The commission shall, pursuant to chapter 14 and sections [216C.05](#) to [216C.30](#) and this section, adopt assessment of need criteria to be used in the determination of need for large energy facilities pursuant to this section.

Subd. 2. Certificate required.

No large energy facility shall be sited or constructed in Minnesota without the issuance of a certificate of need by the commission pursuant to sections [216C.05](#) to [216C.30](#) and this section and consistent with the criteria for assessment of need.

Subd. 3. **Showing required for construction.**

No proposed large energy facility shall be certified for construction unless the applicant can show that demand for electricity cannot be met more cost effectively through energy conservation and load-management measures and unless the applicant has otherwise justified its need. In assessing need, the commission shall evaluate:

(1) the accuracy of the long-range energy demand forecasts on which the necessity for the facility is based;

(2) the effect of existing or possible energy conservation programs under sections [216C.05](#) to [216C.30](#) and this section or other federal or state legislation on long-term energy demand;

(3) the relationship of the proposed facility to overall state energy needs, as described in the most recent state energy policy and conservation report prepared under section [216C.18](#), or, in the case of a high-voltage transmission line, the relationship of the proposed line to regional energy needs, as presented in the transmission plan submitted under section [216B.2425](#);

(4) promotional activities that may have given rise to the demand for this facility;

(5) benefits of this facility, including its uses to protect or enhance environmental quality, and to increase reliability of energy supply in Minnesota and the region;

(6) possible alternatives for satisfying the energy demand or transmission needs including but not limited to potential for increased efficiency and upgrading of existing energy generation and transmission facilities, load-management programs, and distributed generation;

(7) the policies, rules, and regulations of other state and federal agencies and local governments;

(8) any feasible combination of energy conservation improvements, required under section [216B.241](#), that can (i) replace part or all of the energy to be provided by the proposed facility, and (ii) compete with it economically;

(9) with respect to a high-voltage transmission line, the benefits of enhanced regional reliability, access, or deliverability to the extent these factors improve the robustness of the transmission system or lower costs for electric consumers in Minnesota;

(10) whether the applicant or applicants are in compliance with applicable provisions of sections [216B.1691](#) and [216B.2425, subdivision 7](#), and have filed or will file by a date certain an application for certificate of need under this section or for certification as a priority electric

transmission project under section [216B.2425](#) for any transmission facilities or upgrades identified under section [216B.2425, subdivision 7](#);

(11) whether the applicant has made the demonstrations required under subdivision 3a; and

(12) if the applicant is proposing a nonrenewable generating plant, the applicant's assessment of the risk of environmental costs and regulation on that proposed facility over the expected useful life of the plant, including a proposed means of allocating costs associated with that risk.

Subd. 3a. Use of renewable resource.

The commission may not issue a certificate of need under this section for a large energy facility that generates electric power by means of a nonrenewable energy source, or that transmits electric power generated by means of a nonrenewable energy source, unless the applicant for the certificate has demonstrated to the commission's satisfaction that it has explored the possibility of generating power by means of renewable energy sources and has demonstrated that the alternative selected is less expensive (including environmental costs) than power generated by a renewable energy source. For purposes of this subdivision, "renewable energy source" includes hydro, wind, solar, and geothermal energy and the use of trees or other vegetation as fuel.

Subd. 3b. Nuclear power plant; new construction prohibited; relicensing.

(a) The commission may not issue a certificate of need for the construction of a new nuclear-powered electric generating plant.

(b) Any certificate of need for additional storage of spent nuclear fuel for a facility seeking a license extension shall address the impacts of continued operations over the period for which approval is sought.

Subd. 4. Application for certificate; hearing.

Any person proposing to construct a large energy facility shall apply for a certificate of need and for a site or route permit under chapter 216E prior to construction of the facility. The application shall be on forms and in a manner established by the commission. In reviewing each application the commission shall hold at least one public hearing pursuant to chapter 14. The public hearing shall be held at a location and hour reasonably calculated to be convenient for the public. An objective of the public hearing shall be to obtain public opinion on the necessity of granting a certificate of need and, if a joint hearing is held, a site or route permit. The commission shall designate a commission employee whose duty shall be to facilitate citizen participation in the hearing process. Unless the commission determines that a joint hearing on siting and need under this subdivision and section [216E.03, subdivision 6](#), is not feasible or more efficient, or otherwise not in the public interest, a joint hearing under those subdivisions shall be held.

Subd. 5. Approval, denial, or modification.

Within 12 months of the submission of an application, the commission shall approve or deny a certificate of need for the facility. Approval or denial of the certificate shall be accompanied by a statement of the reasons for the decision. Issuance of the certificate may be made contingent upon modifications required by the commission. If the commission has not issued an order on the application within the 12 months provided, the commission may extend the time period upon receiving the consent of the parties or on its own motion, for good cause, by issuing an order explaining the good cause justification for extension.

Subd. 6. Application fees; rules.

Any application for a certificate of need shall be accompanied by the application fee required pursuant to this subdivision. The application fee is to be applied toward the total costs reasonably necessary to complete the evaluation of need for the proposed facility. The maximum application fee shall be \$50,000, except for an application for an electric power generating plant as defined in section [216B.2421, subdivision 2, clause \(1\)](#), or a high-voltage transmission line as defined in section [216B.2421, subdivision 2, clause \(2\)](#), for which the maximum application fee shall be \$100,000. Costs exceeding the application fee and reasonably necessary to complete the evaluation of need for the proposed facility shall be recovered from the applicant. If the applicant is a public utility, a cooperative electric association, a generation and transmission cooperative electric association, a municipal power agency, a municipal electric utility, or a transmission company, the recovery shall be done pursuant to section [216B.62](#). The commission shall establish by rule pursuant to chapter 14 and sections [216C.05](#) to [216C.30](#) and this section, a schedule of fees based on the output or capacity of the facility and the difficulty of assessment of need. Money collected in this manner shall be credited to the general fund of the state treasury.

Subd. 7. Participation by other agency or political subdivision.

(a) Other state agencies authorized to issue permits for siting, construction or operation of large energy facilities, and those state agencies authorized to participate in matters before the commission involving utility rates and adequacy of utility services, shall present their position regarding need and participate in the public hearing process prior to the issuance or denial of a certificate of need. Issuance or denial of certificates of need shall be the sole and exclusive prerogative of the commission and these determinations and certificates shall be binding upon other state departments and agencies, regional, county, and local governments and special purpose government districts except as provided in sections [116C.01](#) to [116C.08](#) and [116D.04, subdivision 9](#).

(b) An applicant for a certificate of need shall notify the commissioner of agriculture if the proposed project will impact cultivated agricultural land, as that term is defined in section [216G.01, subdivision 4](#). The commissioner may participate in any proceeding on the application and advise the commission as to whether to grant the certificate of need, and the best options for mitigating adverse impacts to agricultural lands if the certificate is granted. The Department of Agriculture shall be the lead agency on the development of any agricultural mitigation plan required for the project.

Subd. 8. Exemptions.

This section does not apply to:

(1) cogeneration or small power production facilities as defined in the Federal Power Act, United States Code, title 16, section 796, paragraph (17), subparagraph (A), and paragraph (18), subparagraph (A), and having a combined capacity at a single site of less than 80,000 kilowatts; plants or facilities for the production of ethanol or fuel alcohol; or any case where the commission has determined after being advised by the attorney general that its application has been preempted by federal law;

(2) a high-voltage transmission line proposed primarily to distribute electricity to serve the demand of a single customer at a single location, unless the applicant opts to request that the commission determine need under this section or section [216B.2425](#);

(3) the upgrade to a higher voltage of an existing transmission line that serves the demand of a single customer that primarily uses existing rights-of-way, unless the applicant opts to request that the commission determine need under this section or section [216B.2425](#);

(4) a high-voltage transmission line of one mile or less required to connect a new or upgraded substation to an existing, new, or upgraded high-voltage transmission line;

(5) conversion of the fuel source of an existing electric generating plant to using natural gas;
or

(6) the modification of an existing electric generating plant to increase efficiency, as long as the capacity of the plant is not increased more than ten percent or more than 100 megawatts, whichever is greater.

Subd. 9. Renewable energy standard facilities.

This section does not apply to a wind energy conversion system or a solar electric generation facility that is intended to be used to meet the obligations of section [216B.1691](#); provided that, after notice and comment, the commission determines that the facility is a reasonable and prudent approach to meeting a utility's obligations under that section. When making this determination, the commission must consider:

(1) the size of the facility relative to a utility's total need for renewable resources;

(2) alternative approaches for supplying the renewable energy to be supplied by the proposed facility;

(3) the facility's ability to promote economic development, as required under section [216B.1691](#), subdivision 9;

- (4) the facility's ability to maintain electric system reliability;
- (5) impacts on ratepayers; and
- (6) other criteria as the commission may determine are relevant.