

STATE OF MINNESOTA
 OFFICE OF ADMINISTRATIVE HEARINGS
 FOR THE
 MINNESOTA PUBLIC UTILITIES COMMISSION

In the Matter of the Application of Great
 River Energy, Northern States Power
 Company (d/b/a Xcel Energy) and others
 for Certificates of Need for Three 345 kV
 Transmission Lines

TABLE OF CONTENTS

	Page
STATEMENT OF THE ISSUES	2
SUMMARY OF RECOMMENDATIONS	2
FINDINGS OF FACT	3
Applicants	3
Other Parties	5
Brief Description of the Proposed Projects	7
Procedural Summary	8
Environmental Report	10
Criteria for Certificate of Need	11
CapX Planning	12
CapX Vision Study	13
Southern Minnesota, Southwestern Wisconsin Reliability Enhancement Study (Rochester/La Crosse Study)	15
Red River Valley/West Central Minnesota Transmission Improvement Planning Study (TIPS Report) and the Red River Valley/Northwest Minnesota Load- Serving Transmission Study (TIPS Update)	16
Southwestern Minnesota – Twin Cities EHV Development Electric Transmission Study (Southwestern Minnesota Study or EHV Study).....	17
Renewable Energy Standards	18
Additional Studies	18
Overall Project Description	19
La Crosse Project Description	20
Alma Crossing.....	21
Southern Crossing	21
Fargo Project Description	23
Brookings Project Description	26
Common Characteristics of the Proposed Projects	28
Lower Voltage Upgrades.....	29
Evaluation of Criteria for Certificate of Need	30

A. The Probable Result of Denial Would Be an Adverse Effect Upon the Future Adequacy, Reliability, or Efficiency of Energy Supply to the Applicant, to the Applicant’s Customers, or to the People of Minnesota and Neighboring States, Considering:	30
A (1). Accuracy of the Applicants’ Forecast of Demand for the Type of Energy that Would be Supplied by the Proposed Facility.	30
Regional Reliability	30
Applicants’ Forecasted Load Growth	32
OES Forecast Analysis	33
MISO Analysis of Forecast	35
Objections to the Load Growth Projections	36
Community Reliability	39
Projected Load Growth for Rochester	39
Projected Load Growth for La Crosse	41
MISO Review of the La Crosse Project	42
Load Growth in the Red River Valley	44
Load Growth in Alexandria	45
Load Growth in St. Cloud	46
MISO Review of the Fargo Project	46
Projected Local Load Growth for the Brookings Project	47
Generation Outlet Capacity	48
Benefits of the Upsized Alternative	50
A (2). Effects of the Applicants’ Existing or Expected Conservation Programs and State and Federal Conservation Programs.	52
Public Support for Conservation, Demand Management, and Renewable Energy	52
A (3). Effects of the Applicants’ Promotional Practices.	54
A (4). Ability of Facilities that Do Not Require Certificates of Need to Meet the Future Demand.	54
A (5). The Effect of the Proposed Facility, or a Suitable Modification, to Use Resources Efficiently.	55
B. A More Reasonable and Prudent Alternative to the Proposed Facility Has Not Been Demonstrated by a Preponderance of the Evidence on the Record, Considering:	55
B (1). The Appropriateness of the Size, Type and Timing of the Proposed Facility, Relative to Reasonable Alternatives.	55
Development of the Upsized Alternative	57
Selection of Conductor	62
Installation of Direct Current (DC) Lines	62
NAWO/ILSR Has Failed to Provide an Alternative to the CapX Projects	62
B (2). The Cost of the Proposed Facility and the Energy Supplied by It, Relative to Reasonable Alternatives.	67
Cost to Minnesota Customers	68
B (3). The Effects of the Proposed Facility Upon the Natural and Socioeconomic Environments Compared to the Effects of Reasonable Alternatives.	69
Effect on the Land and Its Inhabitants	69

Ozone and Nitrogen Oxide Emissions	74
Audible Noise	74
Radio and Television Interference.....	75
Electric and Magnetic Fields	75
Effect of CapX on Development of Coal Generation	77
Economic Benefits of Construction and Operation.....	79
B (4). The Expected Reliability of the Proposed Facility, Relative to Reasonable Alternatives.	80
C. The Applicants Must Show that the Proposed Facility or a Suitable Modification Will Provide Benefits to Society Compatible with Protecting the Natural and Socioeconomic Environments, including Human Health.	81
C (1). The Relationship of the Proposed Facility, or a Suitable Modification, to the State Energy Needs.....	81
C (2). The Effects of the Proposed Facility Relative to Not Building the Facility.	81
C (3). The Effects of the Facility, or a Suitable Modification Thereof, in Inducing Future Development.	82
C (4). The Socially Beneficial Uses of the Output of the Proposed Facility, or a Suitable Modification, Including Its Uses to Protect or Enhance Environmental Quality.....	82
D. The Design, Construction, or Operation of the Proposed Facility, or a Suitable Modification, Will Comply with Relevant Policies, Rules, and Regulations of Other State and Federal Agencies and Local Governments.....	83
Proposed Conditions	83
Limiting New Generation Outlet To Renewable Energy	83
C-BED Conditions	88
Statutory Enactments That Affect the Determination of Need.....	89
Minnesota Greenhouse Gas Emissions	90
Evidentiary Support for the Findings of Fact	90
CONCLUSIONS.....	91
RECOMMENDATIONS.....	Error! Bookmark not defined.
NOTICE	94
MEMORANDUM	94
ATTACHMENT A - CapX2020: Twin Cities – Fargo 345 kV Project.....	A
ATTACHMENT B – CapX2020: Twin Cities – Brookings County 345 kV Project....	B
ATTACHMENT C – CapX2020: Twin Cities – La Crosse 345 kV Project – Southern Crossing.....	C
ATTACHMENT D – CapX2020: Twin Cities to La Crosse 345 kV Project – Alma Crossing.....	D
ATTACHMENT E – Revised Figure 6-6*, Load Growth Forecasts.....	E
ATTACHMENT F – Estimated Project Cost	F

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**FINDINGS OF FACT,
CONCLUSIONS AND
RECOMMENDATIONS**

A public hearing was held before Beverly Jones Heydinger, Administrative Law Judge (ALJ), commencing on June 17, 2008, at Moorhead, Minnesota, and continuing at dates and places more specifically set forth below. The evidentiary portion of the hearing was held from July 14, 2008, to August 1, 2008; from August 11, 2008, to August 14, 2008; and from September 11, 2008, to September 18, 2008, in Saint Paul, Minnesota.

The hearing record closed upon receipt of the Post-Hearing Reply Memoranda on January 23, 2009.

Appearances:

Michael C. Krikava and Lisa M. Agrimonti, Briggs and Morgan, P.A., and Priti Patel, Assistant General Counsel, Northern States Power Company (Xcel Energy), on behalf of Xcel Energy and co-Applicant Great River Energy (GRE), (Applicants), and other CapX2020 utilities.

Joyce Osborn and Roger Tupy, on behalf of United Citizens Action Network (UCAN).

Paula Maccabee, Attorney at Law, on behalf of Citizens Energy Task Force (CETF).

Carol Overland, Overland Law Office, on behalf of NoCapX2020 (NoCapX).¹

¹ At the time Ms. Overland filed a Notice of Appearance, she was suspended from the practice of law and NoCapX was not registered as an organization with the Secretary of State. Thus, Ms. Overland appeared

George Crocker, Executive Director, North American Water Office, on behalf of the North American Water Office and the Institute for Local Self Reliance (NAWO/ILSR).

Mary Winston Marrow and Elizabeth Goodpaster, Staff Attorneys, Minnesota Center for Environmental Advocacy (MCEA), on behalf of MCEA, Wind on the Wires, Izaak Walton League of America - Midwest Office, and Fresh Energy (collectively, MCEA or Joint Intervenors).

Christopher K. Sandberg, Lockridge Grindal Nauen, on behalf of Midwest Independent Transmission System Operator, Inc. (MISO).

Julia Anderson, Assistant Attorney General, on behalf of the Department of Commerce, Office of Energy Security (OES).

Bob Cupit and Bret Eknes, planning directors, Minnesota Public Utilities Commission (Commission), appeared on behalf of the Commission.²

STATEMENT OF THE ISSUES

Have Applicants satisfied the criteria set forth in Minnesota Statutes § 216B.243, Minnesota Rules Chapter 7849³ and other applicable statutes, for Certificates of Need for three 345 kV transmission line projects, collectively referred to as CapX2020 (CapX):

- a. Twin Cities to La Crosse 345 kV project (La Crosse Project);
- b. Twin Cities to Fargo 345 kV project (Fargo Project);
- c. Twin Cities to Brookings 345 kV project (Brookings Project).

SUMMARY OF RECOMMENDATIONS

1. That the Commission approve the La Crosse Project as proposed, subject to the following:

- a. The final decision concerning the location of the Mississippi River crossing and the termination point near La Crosse shall be made in the routing proceeding;
- b. Approve the third quarter of 2011 as the in-service date for the Northern Hills-North Rochester 161 kV line, subject to modification in the course of proceedings addressing the certificates of need for the RIGO projects.

on her own behalf until August 11, 2008, when the organization registered, and as Executive Director from that date until she was reinstated on September 3, 2008.

² Commission staff Tricia DeBleeckere and Andrew Mensing assisted at the public hearings; Mr. Mensing also assisted at the evidentiary hearing.

³ Unless otherwise noted, statutes are cited to the 2008 edition and rules are cited to the 2007 edition.

- c. Approve the North Rochester-Chester 161 kV line, or in the alternative, a direct connection of the 345 kV line at the Chester Substation, if dictated by selection of the Southern Crossing in the routing proceeding.

2. That the Commission approve the Fargo Upsized Alternative, subject to the following: The decision whether the northwestern termination should be at the Maple River Substation or at a new substation near Fargo, North Dakota, shall be determined in the routing proceeding, with due regard for the authority of the North Dakota Public Service Commission.

3. That the Commission approve the Brookings Upsized Alternative, subject to the following: The decision whether the eastern termination should be at the Lake Marion Substation or the Hampton Corners Substation cannot be made on this record. The Commission may request that the Applicants explain why the new substation was included in the supporting studies, and its benefits to regional reliability, community load serving, and generation outlet.

Based on the evidence in the hearing record, the Administrative Law Judge makes the following:

FINDINGS OF FACT

Applicants

1. Xcel Energy is a public utility. Xcel Energy owns and operates high voltage transmission lines in Minnesota and delivers electricity to its customers in Minnesota, North Dakota, and South Dakota.

2. GRE is a generation and transmission cooperative that operates high voltage transmission lines in Minnesota and provides wholesale electric service to 28 distribution cooperatives. GRE is not a public utility.

3. Xcel Energy and GRE, the Applicants, have jointly applied as the Applicants for Certificates of Need to construct three 345 kV transmission line projects from the Twin Cities metropolitan area to La Crosse, Fargo, and Brookings. Each project includes a 345kV transmission line and associated system upgrades. GRE is participating in the planning and development of the Brookings Project and Fargo Project; Xcel Energy is participating in the planning and development of all three proposed projects.

4. Each of the three projects meets the definition of “large energy facility” and requires a certificate of need.⁴

⁴ Minn. Stat. §§ 216B.243 and 216B.2421; Transcript volume (T.) 15 at 123 (Alders).

5. The Applicants are acting on their own behalf and also on behalf of other utilities participating in the proposed CapX expansion. Other utilities participating in the development of the three projects are:

- Central Minnesota Municipal Power Agency (Brookings Project)
- Dairyland Power Cooperative (La Crosse Project)
- Minnesota Power (Fargo Project)
- Missouri River Energy Services (Fargo Project and Brookings Project)
- Otter Tail Power Company (Fargo Project and Brookings Project)
- Rochester Public Utilities (La Crosse Project)
- Southern Minnesota Municipal Power Agency (La Crosse Project)
- Wisconsin Public Power, Inc. (La Crosse Project)

6. The utilities have signed a Participation Agreement to jointly plan, coordinate and identify transmission upgrades and additions for the region. A copy of the Participation Agreement is attached to the Application.⁵ In addition, participating utilities have signed Project Development Agreements (PDAs) setting out their participation with the three CapX projects.⁶ Each of the three projects has a “Development Manager” responsible for obtaining major permits and overseeing the project if it is authorized. GRE is the Development Manager for the Brookings Project; Xcel Energy is the Development Manager for the Fargo and La Crosse Projects.⁷

7. The PDAs do not require the participating utilities to own the completed transmission lines, but each signatory will have the right to invest in the ownership. Figure 1-11 of the Application sets forth the potential/non-binding ownership percentages.⁸

8. Since the Participation Agreement and the PDAs were signed, no additional participants have joined or withdrawn from CapX, and there have been no other amendments to either the Participation Agreement or the PDAs.⁹

9. Although the participating utilities are engaged in the development of one or more of the three transmission line projects, Xcel Energy and GRE are the Applicants

⁵ Ex. 2, Appendix (Apx.) B-1.

⁶ Ex. 1 at 1.24-1.25 (Application); Ex. 64 at 12-13 (McCarten Direct); Ex. 2, Apx. B-2, B-3 and B-4.

⁷ Ex. 64 at 13-14 (McCarten Direct).

⁸ Reproduced at Ex. 64 at 16 (McCarten Direct).

⁹ T. 6 at 70-73 (McCarten).

and have assumed the responsibility to implement the Commission's orders in this proceeding.¹⁰

10. The Applicants have presented an alternative for each of the three proposed projects. In each instance, their alternative, the "Upsized Alternative," would increase the future capacity of the proposed project.

Other Parties

11. UCAN is a group of Minnesota landowners whose private property interests may be directly affected by the outcome of the certificate of need application. It advocates for the rights of landowners and citizens in state regulatory proceedings concerning construction of large energy facilities.¹¹ UCAN asserts that the Applicants have failed to show that the proposed projects are needed to serve local load, to assure regional reliability, or to assure compliance with the State's renewable energy standards.

12. CETF is a public interest group of Dakota County residents, many of whom are concerned that the proposed CapX projects would directly impact their property.¹² CETF asserts that the certificate of need for the La Crosse Project should not be granted; that the certificate of need for the Fargo Project should not be granted, except for the segment from Monticello to St. Cloud; and that the certificate of need for the Brookings Project as proposed should be granted, subject to conditions that support renewable wind energy, enhance community-based energy development, and minimize the adverse effect on residents and farm workers.

13. NoCapX is an organization of landowners and residents in the vicinity of one of the transmission corridors.¹³ NoCapX asserts that the Applicants have not met their burden of proving that the CapX projects meet the criteria for a certificate of need and that the size of the proposed projects far exceeds the demonstrated need to serve projected load growth.

14. NAWO/ILSR represents the interests of community-based renewable energy projects that may be affected by the development of the electrical transmission grid.¹⁴ NAWO/ILSR asserts that the certificate of need for the La Crosse Project should be denied, and that the certificate of need for the Fargo Project should be denied, except for the segment from Monticello to St. Cloud. It also opposes the certificate of need for the Brookings Project, but if the certificate of need is granted, NAWO/ILSR requests that it be conditioned upon the Applicants entering into power purchase

¹⁰ T. 15 at 124-125 (Alders); Ex. 64 at 13-14 (McCarten Direct).

¹¹ Petition to Intervene of United Citizens Action Network.

¹² Petition to Intervene of Citizens Energy Task Force.

¹³ NoCapX2020 Petition to Intervene.

¹⁴ Petition to Intervene of the North American Water Office (NAWO) and the Institute for Local Self Reliance (ILSR).

agreements for 600 megawatts (MW) of renewable energy from 10 MW to 40 MW community-based energy development (C-BED) projects.¹⁵

15. MCEA (or Joint Intervenors) represents four organizations that actively support wind energy development. Wind on the Wires is a policy organization focused on overcoming the barriers to delivering wind energy to market in the Upper Midwest. Wind on the Wires has many member organizations, including environmental organizations, wind developers, tribal interests, and businesses that supply goods and services to the wind industry. The Izaak Walton League of America – Midwest Office is a nonprofit conservation organization committed to protecting fish and wildlife, critical habitat, and air and water resources. Fresh Energy is a nonprofit organization that works in the public interest to stimulate technological advancements for sustainable energy. MCEA is a nonprofit environmental organization with five programs, including an energy program, which advances the pursuit of environmentally sustainable sources of energy.¹⁶ MCEA supports granting the certificates of need for the projects as proposed or the Upsized Alternatives if conditions are placed on the certificates requiring that any additional firm generation outlet capacity created by the CapX projects be used to fulfill the Applicants' requirements under the State's renewable energy standards. MCEA prefers the Upsized Alternative.

16. MISO is the independent regional transmission operator for 15 states and the province of Manitoba.¹⁷ It administers a common tariff that applies to transmission services in the region and operates a wholesale energy market that prices transmission services and balances generation supply and transmission. MISO conducts long-term studies to assure sufficient transmission to serve load, meet renewable energy mandates, and serve existing and new generation.¹⁸ It periodically issues Midwest ISO Transmission Expansion Plans (MTEP).¹⁹ MISO oversees a process for new interconnection requests to be studied and added to the transmission system, the "MISO queue" process. MISO asserts that the Applicants have met their burden of proving that all three CapX projects meet the criteria for certificates of need as proposed by the Applicants.

17. OES was created by Executive Order to address the statutory duties of the commissioner of commerce for energy, climate change, and greenhouse emissions. By statute, it has the right to intervene in certificate of need proceedings.²⁰ Its Energy Issues Intervention Office represents the interests of Minnesota in energy matters outside the state as well.²¹ OES recommends that the certificates of need be granted

¹⁵ NAWO/ILSR asserts that the need to serve local load in Saint Cloud could be addressed by a short extension of a 345 kV line from Monticello or unspecified "competitive generation."

¹⁶ Petition to Intervene of Wind on the Wires, Izaak Walton League of America – Midwest Office, Fresh Energy and Minnesota Center for Environmental Advocacy.

¹⁷ Ex. 61 is a list of the MISO members.

¹⁸ Petition to Intervene of the Midwest ISO.

¹⁹ See, e.g., Ex. 59, MTEP 07.

²⁰ Executive Order, January 17, 2008; Minn. Stat. § 216C.10 (a)(9).

²¹ Minn. Stat. § 216A.085.

for the Upsized Alternative, with some modifications to the Applicants' proposed endpoints for the La Crosse Project and the Fargo Project.

18. The Prairie Island Indian Community was granted party status on January 3, 2008.²² It asked to withdraw as a party on August 15, 2008, and was dismissed without objection on August 21, 2008.

Brief Description of the Proposed Projects

19. The Applicants have applied for certificates of need to construct three 345 kV transmission line projects to improve regional transmission system reliability, enhance community service, and increase generation outlet capacity, particularly for renewable energy. Each of the three projects is functionally independent and does not depend on another project to go forward.²³

20. The La Crosse Project includes an approximately 150-mile long 345kV transmission line from a proposed new Hampton Corner substation in the southeast quadrant of the Twin Cities area to a new substation that would be built in the La Crosse, Wisconsin area. This project also includes two 161 kV transmission lines.²⁴

21. The Applicants initially proposed four alternative points for the La Crosse Project to cross the Mississippi River from Minnesota to Wisconsin. The Trempealeau crossing was withdrawn from consideration,²⁵ but the others, at Alma (Alma Crossing), or at Winona/La Crescent (Southern Crossing), are still proposed alternatives.

22. The Fargo Project includes an approximately 250-mile 345 kV line from Fargo, North Dakota, to Alexandria, St. Cloud, and Monticello.²⁶

23. The Brookings Project includes an approximately 200-mile 345 kV line from Brookings, South Dakota, to the southeastern quadrant of the Twin Cities area, with a related 345 kV transmission line between Marshall and the east side of Granite Falls.²⁷

24. The estimated cost of the three projects as proposed, including upgrades to the underlying system, is \$1.42 to \$1.7 billion.²⁸

25. In prefiled testimony, OES witness Dr. Rakow recommended that the Fargo Project be "upsized" to single circuit 500 kV rather than single circuit 345 kV

²² First Prehearing Order, Jan. 3, 2008.

²³ T. 15 at 123-124 (Alders).

²⁴ Ex. 1 at 2.1 (Application); Ex. 83 at 3 (Stevenson Direct).

²⁵ Ex. 128 at 9-10 (Rasmussen Direct).

²⁶ Ex. 1 at 2.1 (Application); Ex. 83 at 11 (Stevenson Direct).

²⁷ Ex. 1 at 2.1 (Application); Ex. 116 at 2 (Lennon Direct).

²⁸ The costs are summarized on Attachment F to this Report.

proposed by the Applicants.²⁹ MCEA witness Mr. Schedin recommended that the project be built as double-circuit 345 kV rather than single circuit 345 kV.³⁰

26. In response to this testimony, the Applicants re-examined all three of the projects and concluded that their initial proposals were sufficient to meet the regional reliability, load-serving, and immediate generation outlet needs, but that there could be benefits to building larger facilities to provide greater future capacity. The Applicants proposed an alternative in their Rebuttal Testimony, referred to as the “Double-Circuit Compatible Alternative” or “Upsized Alternative.”³¹

27. In general, the Upsized Alternative increases the size of the structures that carry the transmission lines so that the structures are large enough to accommodate a second 345 kV circuit line at a later date. One side of the poles would be strung upon construction, and the davit arms for the second side and the second circuit would be added at a later date as needed.³² Applicants’ acknowledge that the second circuit could not be strung without obtaining a certificate of need or other regulatory approvals in a subsequent proceeding.³³

28. The estimated cost of the Upsized Alternative, including upgrades to the underlying system, is approximately \$1.6 billion to \$1.9 billion, an increase of about \$200 million above the CapX projects as proposed.³⁴

29. The configurations included in the Application and in the Upsized Alternative are depicted in Exhibit 22 (Fargo Project), Exhibit 23 (Brookings Project), Exhibit 24 (La Crosse Project, Southern Crossing), and Exhibit 25 (La Crosse Project, Alma Crossing), which are Attachments A-D to this Report. The estimated costs for each project are summarized on Attachment F to this Report.

Procedural Summary

30. Initially, GRE and Xcel Energy filed separate applications for certificates of need for the three projects, but in an order dated November 3, 2006, the Commission authorized the Applicants to address all three projects in a single application for certificates of need to be filed in Docket No. ET-2/CN-06-1115.

31. On February 5, 2007, Applicants submitted a Request for Exemption from Certain Certificate of Need Application Content Requirements. Applicants also requested leave to proceed on behalf of themselves and the other CapX2020 utilities, although the ultimate ownership of the proposed transmission facilities would be deferred to a later date.

²⁹ Ex. 282 at 20-21, 72-78 (Rakow Direct).

³⁰ Ex. 177 at 23 (Schedin Direct).

³¹ Ex. 121 at 9 (Grivna Rebuttal).

³² Ex. 121 at 10 (Grivna Rebuttal).

³³ Ex. 121 at 32, 36-37 (Grivna Rebuttal).

³⁴ See Attachment F to this Report.

32. On June 4, 2007, the Commission issued its *Order Designating Applicants and Setting Filing Requirements* that modified Applicants' filing requirements, waived certain rules, and specified information to be included in the complete application.

33. On August 16, 2007, Applicants filed an Application for Certificate of Need for Three 345 kV Transmission Line Projects with Associated System Connections (Application) on behalf of themselves and the other CapX utilities.

34. On November 21, 2007, the Commission accepted the Application as substantially complete pending a supplemental filing, and assigned the Administrative Law Judge to conduct the contested case hearing.³⁵

35. A prehearing conference was held on December 18, 2007, and on January 3, 2008, the First Prehearing Order was issued, setting the schedule and parameters for the contested case, including a number of prehearing deadlines. At the prehearing conference, the parties concurred with the proposed schedule and Applicants agreed, in light of the size of the proposed projects, that there was good cause to extend the timeline for the Commission's action on the Application beyond November 27, 2008, as permitted pursuant to Minn. Stat. § 216B.243, subd. 5. Amended scheduling orders were issued on April 22, 2008, May 5, 2008, and May 22, 2008.

36. Applicants filed Direct Testimony on May 15, 2008.

37. OES, MISO, MCEA, NAWO/ILSR and CETF filed Direct Testimony on May 23, 2008. On June 16, 2008, Applicants, OES, MCEA and NAWO/ILSR filed Rebuttal Testimony. On July 3, 2008, Applicants, OES, MCEA and NAWO/ILSR filed Surrebuttal Testimony. Neither UCAN nor NoCapX prefiled any testimony.

38. From June 17, 2008, to July 2, 2008, 19 public hearings were held in 13 different Minnesota communities in the corridors where the three projects are proposed to be located. Public hearings were held in: Moorhead, Fergus Falls, Alexandria, Melrose, Clearwater, Marshall, Redwood Falls, Arlington, New Prague, Lakeville, Cannon Falls, Winona, and Rochester.³⁶

39. The evidentiary hearing commenced in Saint Paul on July 14, 2008, at the Commission's hearing rooms. There were 25 days of hearing, concluding on September 18, 2008. There were more than 300 exhibits received into evidence and 25 witnesses called for cross-examination. Also, on September 18, 2008, Final Rebuttal

³⁵ *Order Accepting Application as Substantially Complete Pending Supplemental Filing*, November 21, 2007.

³⁶ A petition to add a hearing in La Crescent or La Crosse dated Aug. 8, 2008, was filed as a public comment, after the start of the evidentiary hearing. Chipps, filed 8/08/08, Department of Commerce e-docket document number (#) 5464471. See Minn. R. 7829.1100, stating a preference that public hearings be held prior to the start of the evidentiary hearing.

Testimony, making minor cost corrections, was filed by the Applicants without objection,³⁷ and the post-hearing briefing schedule was set.

40. Notice of the public hearings and the evidentiary hearing was published in newspapers throughout the state, as set forth in the Affidavit of Publication, Minnesota Newspaper Association.³⁸ Supplemental notice of the hearings and additional information was sent to approximately 80,000 customers.³⁹

41. Transcripts were prepared for each of the public hearings and the evidentiary hearing and were placed in 37 public libraries for access by the public.⁴⁰

42. On September 26, 2008, the period for public comments closed. Comments were received at the public hearings, by U.S. mail, and by electronic mail. All of the comments have been included in the record and are summarized below.

43. On October 21, 2008, the Applicants concurred in the briefing schedule and agreed that the deadline for action by the Commission on the certificate of need, November 27, 2008, could be extended to allow sufficient time for the briefing, report of the ALJ and the deliberations of the Commission.⁴¹

Environmental Report

44. Minnesota Rule 7849.7030 requires the Department of Commerce to prepare an environmental report (ER) on a proposed high voltage transmission line as part of the certificate of need process:

The environmental report must contain information on the human and environmental impacts of the proposed project associated with the size, type, and timing of the project, system configurations, and voltage. The environmental report must also contain information on alternatives to the proposed project and shall address mitigating measures for anticipated adverse impacts. The commissioner [of commerce] shall be responsible for the completeness and accuracy of all information in the environmental report.

45. Minnesota Rule 7849.7060, subps. 1 and 3, sets forth the topics the ER must address for proposed high voltage transmission lines.

46. On February 18, 2008, the Commissioner of Commerce issued the "Environmental Report Scoping Decision," clarifying that the ER "provides a high level environmental analysis of the proposal and system alternatives, and reviews environmental impacts associated with named and alternative project corridors," that the

³⁷ Ex. 312.

³⁸ Ex. 314.

³⁹ Ex. 31 (Carlsgaard Direct); Ex. 43 (Carlsgaard Rebuttal); Exs. 33-42, 44-47.

⁴⁰ Exs. 315; 316; *Final Notice of Availability of Evidentiary Hearing Transcripts*, Filed 10/3/08, #5547758.

⁴¹ Letter from Michael C. Krikava, Counsel for Applicants, October 21, 2008; Minn. Stat. § 216B.243, subd. 5.

ER was only one part of the Department's investigation of the certificate of need application, and that the ER was not intended to evaluate specific route alternatives. It also spelled out the matters to be addressed in the ER.⁴²

47. OES completed the ER on March 31, 2008. It addressed each topic required by Minn. R. 7849.7060, subs. 1, 3 and 7.⁴³ Because the ER is prepared at an early point in the certificate of need process, prior to the filing of testimony, it is necessarily a preliminary review.⁴⁴

Criteria for Certificate of Need

48. Minnesota Statute § 216B.243 requires a certificate of need prior to construction of a "large energy facility." A large energy facility includes "any high-voltage transmission line with a capacity of 100 kilovolts or more with more than ten miles of its length in Minnesota or that crosses a state line."⁴⁵

49. Each of the three transmission lines and associated facilities, the La Crosse, Fargo and Brookings Projects, constitutes a large energy facility and requires a certificate of need from the Commission before construction can take place.

50. In assessing the need for a proposed transmission line, the criteria set forth in Minn. Stat. § 216B.243, subd. 3, and Minn. R. 7849.0120 must be evaluated. The Applicants bear the burden of proving the need for the proposed transmission line and that the "demand for electricity cannot be met more cost effectively through energy conservation and load-management."⁴⁶

51. Section 216B.243, subd. 3a, must also be evaluated. It states:

The commission may not issue a Certificate of Need under this section for a large energy facility 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.

52. Pursuant to Minn. Stat. § 216B.2422, subd. 4, the Commission shall not grant a certificate of need pursuant to section 216B.243 nor allow rate recovery for a

⁴² Ex. 162, *Environmental Report Scoping Decision*, Minnesota Department of Commerce, PUC Docket No. ET02, E002/CN-06-1115, Feb. 18, 2008.

⁴³ Ex. 5.

⁴⁴ T. 17A at 55-56 (Birkholz).

⁴⁵ Minn. Stat. § 216B.2421, subd. 2 (3).

⁴⁶ Minn. Stat. § 216B.243, subd. 3.

nonrenewable energy facility “unless the utility has demonstrated that a renewable energy facility is not in the public interest.”

53. Under section 216B.243, subd. 3(10), as a condition of granting the certificate of need, the Applicants must comply with the renewable energy goals (referred to as the Renewable Energy Standards or RES) enacted in 2007:

[E]ach electric utility shall generate or procure sufficient electricity generated by an eligible energy technology to provide its retail customers in Minnesota, or retail customers of a distribution utility to which the electric utility provides wholesale electric service, so that at least the following standard percentages of the electric utility’s total retail electric sales to retail customers in Minnesota are generated by eligible energy technologies by the end of the year indicated: 1) 2012 – 12 percent; 2) 2016 – 17 percent; 3) 2020 – 20 percent; and 4) 2025 – 25 percent.⁴⁷

54. Xcel Energy, one of the Applicants, and the largest projected owner of the CapX projects, has higher RES requirements: 1) 2010 – 15 percent; 2) 2012 – 18 percent; 3) 2016 – 25 percent; and 4) 2020 – 30 percent.⁴⁸

55. In evaluating compliance with the RES, the Commission must also consider whether the proposed project will provide opportunities to interconnect “distributed generation,” high-efficiency, low-emissions generation of no more than 10 MW of interconnected capacity,⁴⁹ as well as the utility’s efforts to purchase C-BED projects.⁵⁰

56. If the Applicants demonstrate the need for the proposed facilities, the Commission must determine whether there is evidence in the record demonstrating a more reasonable and prudent alternative to meet the demonstrated need.⁵¹

CapX Planning

57. During the twentieth century, Minnesota had two substantial upgrades to its bulk transmission system. In the early 1900’s, planners designed a ring of 115 kV lines around the Twin Cities to deliver electrical power to the growing city population. In the 1950’s and 1960’s, a similar overall system expansion was undertaken with a 345 kV ring around the Twin Cities, and 230, 345 and 500 kV interconnections to neighboring utilities to enhance reliability and facilitate access to additional generation resources.⁵²

⁴⁷ Minn. Stat. § 216B.1691, subd. 2a (a).

⁴⁸ Minn. Stat. § 216B.1691, subd. 2a (b).

⁴⁹ Minn. Stat. §§ 216B.169, subd. 1 (c), 216B.2426.

⁵⁰ Minn. Stat. §§ 216B.1612, subd. 1 and 5 (c), 216B.1691.

⁵¹ See, Minn. R. 7849.0120.

⁵² Ex. 1 at 3.25-3.26 (Application).

58. In 2004, a group of utilities jointly conducted engineering studies to develop a comprehensive plan to meet the anticipated increased demand for electricity in Minnesota and the surrounding area through the year 2020.

59. “CapX2020” was the name given to the initiative to study, develop, permit and construct transmission infrastructure to meet transmission needs through the year 2020. Initially, it included the Applicants, Minnesota Power, Missouri River Energy Services, and Otter Tail Power Company. “CapX2020” is short for “Transmission Capacity Expansion Initiative by the year 2020.”⁵³

60. In 2005, the CapX participants conducted a broad overview of the required transmission infrastructure investments needed to serve Minnesota and the surrounding states through 2020, referred to as the “Vision Plan” or “Vision Study.”⁵⁴

CapX Vision Study

61. In developing the Vision Study, the engineers examined the overall system of utilities serving Minnesota customers and the growth in demand for electricity anticipated by the year 2020. In 2005, the demand on the electrical system within the study region was 19,300 MW. The planning engineers gathered 2009 summer peak forecast data from the 2004 Mid-Continent Area Power Pool (MAPP) model to calculate a 2009 load level of about 20,200 MW. Using the MAPP Load and Capability Reports and comparable data for companies not included in the MAPP data, the planners calculated the forecasted demand to be about 26,500 MW by 2020, the “estimated growth” level.⁵⁵ The planners also calculated load growth approximately 30 percent lower, to reflect a “slow-growth” scenario. The slow-growth demand was estimated to be about 24,700 MW by 2020. The planning engineers used the estimated growth and slow growth levels to model the performance of the electrical system.⁵⁶

62. Based on the system-wide estimates, the planners projected individual distribution substation annual peak power demand levels.⁵⁷

63. To model the performance of the transmission network, both the magnitude and location of the demand for power by consumers and the generation to meet that demand are added to the computer simulation models. Planning engineers do not know where generation will be added to the system and must rely on forecasts of generation. The planners tested performance of the transmission system using several generation scenarios, and relied in part on the list of projects in the MISO queue at the time as an indication of potential generation development patterns.⁵⁸

⁵³ Ex. 1 at 1.22 (Application).

⁵⁴ Ex. 1, Apx. A-1 (CapX 2020 Technical Update: Identifying Minnesota’s Electric Transmission Infrastructure Needs ((October 2005)).

⁵⁵ Ex. 1 at 6.4-6.7 (Application); Ex. 48 at 3-5 (Lacey Direct).

⁵⁶ Ex. 1 at 6.7 (Application).

⁵⁷ Ex. 1 at 6.5 (Application); Ex. 21 (Response to NAWO/ILSR IR No.12).

⁵⁸ Ex. 1 at 6.15 (Application).

64. The planners also tested the sensitivity of the generation development patterns. They developed three generation scenarios to reflect how the location of potential generation development might influence electric power flows on the regional grid and the size and location of the transmission infrastructure needed to deliver the generation to customers.

65. Three generation scenarios were developed, “North/West Bias,” “Minnesota Bias,” and “Eastern Bias,” each modeling about 6,325 MW of new generation, including 2275 MW of renewable energy generation.⁵⁹ In each scenario, 975 MW of renewable generation was allocated to Minnesota and 1,300 MW of renewable generation was allocated to surrounding states.

- a. North/West Bias: In this model, much of the new generation was imported from Manitoba, North Dakota, South Dakota and Iowa. Of the 4,050 MW of non-renewable generation, 1,950 MW was allocated to Minnesota and 2,100 MW was allocated outside Minnesota.⁶⁰
- b. Minnesota Bias: In this model, the generation from outside of Minnesota was imported from North Dakota, South Dakota and Iowa. The entire 4,050 MW of non-renewable generation was allocated to Minnesota generation.⁶¹
- c. Eastern Bias: In this model, the imported generation was largely from Wisconsin and Iowa. Of the 4,050 MW of non-renewable generation, 1700 MW was allocated to Minnesota and 2,350 MW to other states.⁶²

66. Based on its analysis of where system overloads would occur when the estimated load growth or slow growth was added to the transmission system, the planners modeled several possible transmission additions. They determined that for each of the generation distribution scenarios, there were many necessary transmission additions in common. The “Common Recommended Facilities” are summarized in the Application, Figure 6-32.⁶³ The three CapX projects included in the Application were common to all scenarios.⁶⁴

67. CETF contended that the Applicants have failed to model the type of generation that is likely to be transmitted by the CapX lines. In each of the three generation scenarios, 2275 MW of renewable energy was inserted into the model. The number was selected to meet the Renewable Energy Objectives in effect at that time, but is lower than the currently applicable, higher RES. At least two of the three

⁵⁹ Ex. 1 at 6.18-6.24 (Application).

⁶⁰ Ex. 1 at 6.19 (Application).

⁶¹ Ex. 1 at 6.21 (Application).

⁶² Ex. 1 at 6.23 (Application).

⁶³ Ex. 1 at 6.39 (Application).

⁶⁴ Ex. 1 at 7.1 (Application); Ex. 6 at 17 (Rogelstad Direct).

generation scenarios evaluated in the Vision Study included energy from coal generation. CETF contended that the scenarios are prohibited by the Minnesota Greenhouse Gas Emissions Control law,⁶⁵ and the Applicants have failed to show that the proposed projects can comply with the new law.⁶⁶

68. The Vision Study included a mix of renewable and non-renewable generation in three areas to evaluate where new transmission facilities would be needed. The selection did not presume that the type of generation would occur as it was modeled. Rather, Applicants modeled a variety of scenarios to assure flexibility in meeting demand for any new generation.⁶⁷ There is no evidence that the projects' design could not serve a significant increase in the proportion of renewable generation to the RES level or above.

69. The Vision Study provided a long-range analysis and an analytical framework to guide project planning. Three additional engineering studies assessed and developed projects to address specific needs.⁶⁸

Southern Minnesota, Southwestern Wisconsin Reliability Enhancement Study (Rochester/La Crosse Study)⁶⁹

70. Local load studies were performed for Rochester and La Crosse/Winona to forecast future load growth and the ability of the current system to meet it. A number of alternatives were evaluated in each of the local load-serving studies. The study results demonstrated that a 345 kV option would provide the best long-term solutions and would be least-cost or require fewer additional lower voltage lines. Based on the results of the local studies, the Rochester/La Crosse Study was designed to evaluate 345 kV alternatives. As part of the study, the planning engineers evaluated possible sources for the 345 kV connection and concluded that the Twin Cities offered the strongest, closest connection.⁷⁰ Five options were considered and refined, leading to development of the proposed La Crosse Project, including the recommendation to construct a new substation at Hampton Corner to better separate the proposed line from existing 345 kV lines and decrease the risk of outage.⁷¹

71. The engineers concluded from the study that a new 345 kV line would provide reliable service to Rochester by increasing the peak load serving capability of the transmission system in the Rochester area to 821 MW, a level expected to meet need until 2041 to 2053.⁷² Continuing the new 345 kV connection to the La Crosse area would serve that area's needs until approximately 2025.⁷³ The engineers also predicted

⁶⁵ Minn. Stat. § 216H.03.

⁶⁶ CETF Posthearing Brief at 19-23.

⁶⁷ Ex. 2B at 21-22 (Rogelstad).

⁶⁸ Ex. 6 at 11-12 (Rogelstad Direct).

⁶⁹ Ex. 1, Apx. A-2 (Mar. 13, 2006) (Application).

⁷⁰ See Ex. 1 at 5.1-5.11 (Application); Ex. 94 at 13-16 (King Direct).

⁷¹ Ex. 94 at 16 (King Direct).

⁷² Ex. 94 at 18 (King Direct).

⁷³ Ex. 94 at 22 (King Direct).

that a new 345 kV line would improve the overall system stability and reliability in southeastern Minnesota and into Wisconsin.⁷⁴

72. Another study, the Regional Incremental Generator Outlet (RIGO) Study, evaluated generator outlet capacity in Southeastern Minnesota. As a result of the RIGO Study, three new lines are under consideration outside of this proceeding: 1) Pleasant Valley–Byron 161 kV line; 2) Pleasant Valley–Willow Creek 161 kV line; 3) Byron–Westside Energy Park 161 kV line. In addition to adding generation outlet capacity, these lines will also provide additional load-serving benefits to Rochester. Approval of these projects may affect Applicants’ requested timing for the North Rochester–Northern Hills 161 kV line included in the La Crosse Project.⁷⁵

Red River Valley/West Central Minnesota Transmission Improvement Planning Study (TIPS Report) and the Red River Valley/Northwest Minnesota Load-Serving Transmission Study (TIPS Update)⁷⁶

73. The TIPS Report and TIPS Update evaluated the transmission system needs in the Red River Valley area because that area experiences low system voltages during peak load conditions. For the northern zone of the Red River Valley, the best performing option was the 230 kV Bemidji to Grand Rapids line. Its certificate of need is addressed in a separate docket. For the southern zone of the Red River Valley, the best performing option was the proposed Fargo Project.⁷⁷

74. In conducting the study, the planners evaluated the system by increasing load and observing when and where system deficiencies occurred. In order to balance the system, it modeled corresponding increases in generation. NAWO/ILSR correctly pointed out that the increased generation was modeled from existing large generation facilities (coal, hydro and nuclear power), and not from renewable energy.⁷⁸ However, the sites were selected solely to test the system under different generation scenarios, as a proxy for any additional generation that might be added. There were no assumptions about what generation would be added to the Fargo Project.⁷⁹

75. In developing the Fargo Project, the planners considered three possible terminations that would increase service to the St. Cloud area and concluded that the Monticello Substation was the optimal endpoint, providing additional reliability improvements and avoiding a Mississippi River crossing.⁸⁰

76. As part of the TIPS Update, the planners evaluated lower voltage lines, but concluded that none of them were adequate to address all of the needs identified in the study. Approximately nine 115 kV lines were required to achieve the capacity that

⁷⁴ Ex. 94 at 23 (King Direct); See Ex. 1 at Figure 5-4 – “Benefit Area of Twin Cities – La Crosse 345 kV Project” (Application).

⁷⁵ Ex. 83 at 10 (Stevenson Direct).

⁷⁶ Ex. 1, Apx. A-3 (Feb. 13, 2006) (Application).

⁷⁷ Ex. 1 at 5.11-5.12 (Application); Ex. 67 at 12-14 (Kline Direct).

⁷⁸ Ex. 1, Apx. A-3 at 16 (Application).

⁷⁹ T. 7 at 81 (Kline).

⁸⁰ Ex. 67 at 14 (Kline Direct); Ex. 70 at 4 (Kline Rebuttal).

one 345 kV line could achieve. Moreover, the 345 kV option provided additional support to the southern Red River Valley that lower voltage lines could not, with more direct ties between northwestern Minnesota and the Twin Cities.⁸¹

77. Engineers considered whether additional generation could provide load serving support but determined that it would be costly and inefficient compared to transmission from abundant generation resources to the west and east.⁸²

Southwestern Minnesota – Twin Cities EHV Development Electric Transmission Study (Southwestern Minnesota Study or EHV Study)⁸³

78. In 2003, the Commission granted certificates of need for transmission infrastructure in the Buffalo Ridge region for approximately 825 MW of generation outlet for proposed wind generation.⁸⁴ In 2007, the Commission granted certificates of need for three 115 kV transmission lines (BRIGO Projects) to increase the generation outlet for proposed wind generation by an additional 275 MW, a total of approximately 1,200 MW of generation outlet capacity from Buffalo Ridge.⁸⁵ The Southwestern Minnesota Study was undertaken to examine what additional improvements were needed to increase generation outlet capacity in southwestern Minnesota beyond 1200 MW.⁸⁶

79. The Vision Study identified the need to construct a 345 kV transmission line in southwestern Minnesota. The Southwestern Minnesota Study was conducted to determine the details of integrating the 345 kV line into the existing transmission system and to identify the benefits of the line. It looked at termination points, intermediate connection points and transformer ratings, line design and other factors to evaluate performance and cost.⁸⁷

80. After examining several options, including four primary options, the planning engineers concluded that the proposed Brookings Project was the best performing option because it provided the most additional outlet capability and would improve the electric system reliability in communities within the project area.⁸⁸

⁸¹ Ex. 67 at 17 (Kline Direct).

⁸² Ex. 70 at 2-3 (Kline Rebuttal).

⁸³ Ex. 1, Apx. A-4 (Nov. 9, 2005) (Application).

⁸⁴ Docket No. E002/CN-01-1958, "825 MW Proceeding".

⁸⁵ Docket No. E002/CN-06-154.

⁸⁶ Ex. 104 at 3-4 (Alholinna Direct).

⁸⁷ Ex. 1, Apx. A-4, at 2 (Application).

⁸⁸ Ex. 104 at 2-5, 10-13 (Alholinna Direct).

Renewable Energy Standards

81. As part of its Renewable Energy Standards Report filed with the Commission, Minnesota Transmission Owners,⁸⁹ including the Applicants, provided a “Gap Analysis.” It estimated the amount of additional renewable energy beyond what is currently produced or planned that will be required to meet the RES.⁹⁰ The Applicants prepared a similar analysis in support of the Application, estimating that utilities will need to generate or procure approximately 5,000 to 6,000 MW of wind generation by 2025. Applicants acknowledged that some utilities may use other forms of renewable energy to meet the RES.⁹¹

Additional Studies

82. Several additional studies to address transmission needs in Minnesota and the surrounding area have been conducted or were in progress at the time of the hearing in this proceeding.

83. On November 7, 2007, Minnesota transmission owners submitted their 2007 Minnesota Biennial Transmission Projects Report.⁹²

84. Vision 2025: This study will examine the projected transmission facilities necessary to serve 2025 load levels in and around Minnesota, focusing on delivering the renewable energy required by the RES. It will look at scenarios with dispersed renewable generation, highly concentrated renewable project, and a scenario that assumes additional wind resources from the east.⁹³

85. RES 2016: This study will identify the transmission alternatives needed to meet the RES milestones for the year 2016 and other generation projects needed to maintain system reliability. It will attempt to refine generation scenarios based on information from the MISO queue and three studies further described below: the DRG studies, the 230 kV Upgrade study, and the G&T Optimization Study.⁹⁴

86. DRG Studies, Phase I and II: The purpose of Phase I was to determine whether up to 600 MW of dispersed renewable generation (DRG) could be sited without major transmission expansions. The Phase I Report was issued on June 16, 2008.⁹⁵ Phase II will consider whether an additional 600 MW of DRG can be added without major transmission expansions. Dispersed generation, as the term is generally used, refers to generation of 10 MW or less.⁹⁶ DRG is sometimes characterized as “C-BED,”

⁸⁹ Docket No. E999/ET-07-1028.

⁹⁰ Ex. 48 at 10-14 (Lacey Direct).

⁹¹ Ex. 2, Apx. D-7 (Application).

⁹² Ex. 54.

⁹³ Ex. 6 at 22-23 (Rogelstad Direct).

⁹⁴ Ex. 6 at 23 (Rogelstad Direct).

⁹⁵ Ex. 110, “Dispersed Renewable Generation Transmission Study,” Volumes 1-3, prepared by Minnesota Transmission Owners, June 16, 2008, Docket No. E999/DI-08-649.

⁹⁶ Ex. 1 at 7.17 (Application); Minn. Stat. § 216B.169, subd. 1 (c).

a “community-based energy development” project. A C-BED project must have specified types of ownership.⁹⁷ DRG ownership is not restricted.

87. 230 kV System Upgrade Study: The Minnesota Valley – Blue Lake 230 kV transmission line limits transfer capability from the western portion of Minnesota to the east. The 230 kV System Upgrade Study will examine the transmission alternatives that eliminate this constraint on the system and allow additional development of renewable generation along the Buffalo Ridge.⁹⁸

88. G & T Optimization: This study will examine the trade-offs of siting wind projects in high quality wind regions and siting the projects in lower quality wind regions with lower associated transmission costs. It will attempt to identify wind development models with both dispersed and concentrated wind generation.⁹⁹

89. The Applicants contended that the studies in progress reinforce the results of the prior studies and the need for major transmission line construction.¹⁰⁰

Overall Project Description

90. The CapX utilities identified four projects to be included in the first group of transmission improvements, collectively referred to as the Group 1 Projects. The Group 1 Projects include the La Crosse, Fargo and Brookings Projects included in this Application (the CapX projects), and a 230 kV transmission project proposed between Grand Rapids and Bemidji that is the subject of a separate proceeding.¹⁰¹

91. The results of the Vision Study demonstrated that the three proposed projects were common to all reasonable scenarios that were studied. In the analysis leading to the Application, several alternatives were considered, including different system configurations with different substations and voltages, upgrading or double-circuiting, no-build alternatives, and using generation as an alternative to transmission facilities. None of the alternatives were able to address the identified needs.¹⁰²

92. The CapX projects are designed to address three types of need: to maintain the reliability of the transmission system while accommodating system wide growth, provide reliable community service in specified areas, and to accommodate new generation in the region and facilitate expanding renewable energy generation.¹⁰³

⁹⁷ Minn. Stat. § 216B.1612, subd. 2.

⁹⁸ Ex. 6 at 23-24 (Rogelstad Direct).

⁹⁹ Ex. 6 at 24 (Rogelstad Direct).

¹⁰⁰ Ex. 6 at 20-25 (Rogelstad Direct).

¹⁰¹ Certificate of need docket number: E017, E015, ET-6/CN-07-1222; Route permit docket number: E017, E015, ET-6/TL-07-1327.

¹⁰² Ex. 1 at ch. 7 (Application).

¹⁰³ Ex. 1 at 3.31-3.32 (Application).

La Crosse Project Description

93. The La Crosse Project refers to the project as proposed in the Application and addressed in the Direct Testimony. The La Crosse Upsized Alternative refers to the alternative proposed by the Applicants in their Rebuttal Testimony. The Applicants are asking the Commission to grant a certificate of need for the La Crosse Project of the Upsized Alternative, but Applicants prefer the Upsized Alternative. Both the La Crosse Project and the Upsized Alternative are illustrated on Exhibits 24 and 25, Attachments C and D hereto. The Minnesota portion of the 345 kV line would be approximately 85 to 140 miles long, depending on the route selected.¹⁰⁴

94. The Applicants propose a 345 kV line that runs from a proposed substation at Hampton Corner,¹⁰⁵ east of Farmington, to a proposed North Rochester substation that would connect the new line to the existing Prairie Island–Byron 345 kV line. The segment from Hampton Corner to North Rochester would be approximately 40 to 50 miles long. In the Upsized Alternative, the segment would be built with 345 kV/345 kV structures, with only one side strung and operated at 345 kV.¹⁰⁶

95. Both the initial proposal and the Upsized Alternative include a 161 kV segment, approximately 10 to 15 miles long, from the proposed North Rochester Substation to the Northern Hills Substation, also in the Rochester area.¹⁰⁷

96. The specifications for the remaining line segments depend upon the location selected to cross the Mississippi River. In the Application, four possible Mississippi River crossings were proposed at existing transmission line crossings or narrow areas with relatively few floodplain wetlands: 1) near Alma, Wisconsin; 2) near Winona; 3) near Trempealeau, Wisconsin; and 4) near La Crosse, Wisconsin.¹⁰⁸

97. The Applicants withdrew the Trempealeau crossing from consideration because no existing transmission line crosses the area, field review showed more residences than expected, and the other three crossings have transmission lines in place.¹⁰⁹

98. The Alma Crossing and the Winona/La Crosse Crossing are still under consideration. The latter two are referred to as the “Southern Crossing.”

¹⁰⁴ Ex. 1 at 2.2 and Figure (Fig.) 2-1: “Map of Twin Cities – La Crosse 345 kV Project Area,” (Application); Ex. 88 at 2 (Stevenson Rebuttal).

¹⁰⁵ The new Hampton Corner Substation would connect the proposed line to the existing Prairie Island – Blue Lake 345 kV transmission line in the vicinity of Hampton, Minnesota. Ex. 1 at 2.2 (Application).

¹⁰⁶ Ex. 1 at 2.2-2.3 (Application); Ex. 83 at 3 (Stevenson Direct); Ex. 88 at 2 (Stevenson Rebuttal); Attachments C and D to this Report.

¹⁰⁷ Ex. 1 at 2.2 (Application); Ex. 121 at 11-12 (Grivna Rebuttal).

¹⁰⁸ Ex. 1 at 2.2-2.3 and Figure 2-1(Application).

¹⁰⁹ Ex. 128 at 9-10 (Rasmussen Direct).

Alma Crossing

99. If the Alma Crossing is selected, the Project will include a 345 kV circuit from North Rochester to Alma on double-circuit structures. The estimated length of the Minnesota segment would be about 40 miles long. The Applicants would replace a portion of the Rochester–Alma 161 kV line with a new 345 kV/161 kV double circuit line, routed through Olmsted and Wabasha Counties. As proposed, the second circuit would operate at 161 kV from North Rochester to Chester, and an existing 161 kV circuit would continue to operate from Chester to Alma. From Alma, the Project will terminate at a La Crosse area substation with a line segment proposed as a single-circuit 345 kV line, operated on a double circuit structure with the Alma to La Crosse 161 kV line.¹¹⁰

100. The Project also includes a new 161 kV line from North Rochester to Chester, approximately 20 to 30 miles long.¹¹¹

101. In the Upsized Alternative, the single 345 kV circuit from Hampton Corner to North Rochester would be placed on 345 kV/345 kV double-circuit structures. Also, the 345 kV line/161 kV double-circuit from North Rochester to Alma as proposed would be constructed as a 345 kV/345 kV double-circuit line, but the second circuit would be operated at 161 kV voltage and carry the existing parallel Chester–Alma 161 kV circuits until circumstances warrant an increase in the voltage. At that point the second circuit would operate at 345 kV, and the 161 kV line would be moved.¹¹²

102. The Applicants are not requesting the authority to operate a double-circuit 345 kV line at this time.

103. The Upsized Alternative does not change the proposed single-circuit 345 kV line from Alma to North La Crosse, placed with an existing Alma to North La Crosse 161 kV line on a double-circuit structure.¹¹³

Southern Crossing

104. As proposed, if the Project crossed the Mississippi River at Winona, the new 345 kV circuit from North Rochester would intersect with the Alma–North La Crosse 161 kV line in Wisconsin and the two lines would be double-circuited into the North La Crosse Substation. If the line from North Rochester crossed through La Crescent, it would not intersect with the Alma–North La Crosse line and would likely terminate at the La Crosse Substation.¹¹⁴

105. With the Southern Crossing, the 345 kV line from North Rochester to the east may be routed close to the Chester Substation. If it is, it may be more effective to

¹¹⁰ Ex. 1 at 2.3 (Application); Ex. 83 at 3-5 (Stevenson Direct).

¹¹¹ Ex. 1 at 2.2 (Application); Ex. 88 at 2 (Stevenson Rebuttal).

¹¹² Ex. 121 at 11 (Grivna Rebuttal); Ex. 25.

¹¹³ Ex. 1 at 2.3 (Application); Ex. 121 at 12 (Grivna Rebuttal).

¹¹⁴ Ex. 1 at 2.3 (Application).

connect the 345 kV line at the Chester Substation, which would eliminate the need for the North Rochester to Chester 161 kV segment.¹¹⁵

106. In the Upsized Alternative, the segment from North Rochester to La Crosse would be constructed using the 345 kV/345 kV double-circuit configuration to match up with the Hampton Corner–North Rochester segment.¹¹⁶

107. The Applicants request that the Commission grant a certificate of need for the proposed project that authorizes a 161 kV line from North Rochester to Chester or the alternative direct connection of the 345 kV line at the Chester Substation, depending on the outcome of the routing across the Mississippi River in the route permit proceeding.¹¹⁷

108. As proposed, the Southern Crossing is the least cost option. OES recommended that the Commission select the Alma Crossing and the North La Crosse Substation termination in this proceeding rather than in the routing proceeding, because it was the least cost choice for the Upsized Alternative.¹¹⁸ In addition, OES reviewed the Applicants' environmental information and concluded that the Alma Crossing would have less environmental impact and would be more acceptable to the U.S. Fish and Wildlife Service.¹¹⁹

109. The Alma Crossing has the least environmental impact, but the specific environmental impact of a selected route or its alternative is not known. Either endpoint is reasonable and may be selected during the routing proceeding.

110. Costs of the La Crosse Project: Applicants estimated that the La Crosse Project would cost between \$364 and \$374 million for the Alma Crossing and \$355 to \$363 for the Southern Crossing. For the Upsized Alternative, the estimate is \$389 to \$415 for the Alma Crossing (an increase of approximately \$25 to \$41 million) and \$407 to \$432 for the Southern Crossing (an increase of approximately \$52 to \$69 million).¹²⁰ The estimate will vary with the timing of construction, availability of construction crews and components, and the route selected by the Commission.¹²¹

111. Timing of the La Crosse Project: Applicants anticipate that each portion of the project will be completed in 2015, with the exception of the Northern Hills–North Rochester 161 kV line. Applicants request the flexibility to install that line by the third

¹¹⁵ Ex. 83 at 7 (Stevenson Direct); Ex. 94 at 19 (King Direct).

¹¹⁶ Ex. 121 at 12 (Grivna Rebuttal); Ex. 24.

¹¹⁷ Ex. 83 at 8 (Stevenson Direct).

¹¹⁸ Ex. 282 at 63 (Rakow Direct); Ex. 307 at 21, 23 (Rakow Surrebuttal). Dr. Rakow estimated that the cost differential between the two endpoints was about \$12 million to \$16 million, present value, for the proposed project and \$25 million to \$40 million, present value, for the Upsized Alternative; T. 25 at 58-59 (Rakow).

¹¹⁹ Ex. 307 at 24-25 (Rakow Surrebuttal), citing Ex. 130 at 3 (Rasmussen Rebuttal), and Ex. 131.

¹²⁰ See Attachment F to this Report; Ex. 89 at 4 (Stevenson Surrebuttal).

¹²¹ Ex. 83 at 11 (Stevenson Direct); See Attachment F to this Report.

quarter of 2011 if the RIGO projects are not approved, and to install it by the fourth quarter of 2012 if the RIGO projects are approved.¹²²

112. No party opposed the proposed flexible in-service date for the Northern Hills–North Rochester 161 kV line. OES offered an alternative: that the Commission approve a 2011 service date, subject to modification in the event that the Commission approves the RIGO lines. This would allow modification of the service date to be more fully explored in the RIGO proceeding.¹²³

113. Alternatives Considered by the Applicants: The Southeastern Minnesota/Southwestern Study explored several options for enhancing reliability in the area to be served by the La Crosse Project. These included options other than transmission construction, including generation, conservation, alternative energy and compliance with RES.¹²⁴ Higher and lower voltage lines were considered, as well as a double-circuit option from the Twin Cities to La Crosse.¹²⁵ OES concurred that a lower voltage alternative to the La Crosse Project would have higher capital costs and higher losses than the 161 kV alternative.¹²⁶

114. In developing its proposal, the Applicants considered possible system upgrades. Applicants concluded that reconductoring could improve reliability for Rochester for five to six years but it was not a reasonable longer-term alternative.¹²⁷

115. “No-Build” Alternative: The Applicants considered the “no-build alternative.” Without the project, by 2011 Rochester may exceed the 362 MW maximum capacity level that is now supported by transmission and generation. La Crosse will be subject to the contingencies discussed in the load forecasts below, and the regional reliability will not be enhanced. Without some new transmission, there will be no improvement in reliability to either community.¹²⁸

Fargo Project Description

116. Applicants seek a certificate of need to construct a series of 345 kV transmission line segments between Monticello, St. Cloud, Alexandria, and Fargo, North Dakota. The Fargo Upsized Alternative refers to the alternative proposed by the Applicants in their Rebuttal Testimony. The Applicants are asking the Commission to grant a certificate of need for either alternative, but Applicants prefer the Upsized Alternative. Both the Fargo Project and the Upsized Alternative are illustrated on Exhibit 22, Attachment A hereto. The overall length of the project would be approximately 210 to 270 miles, depending on the route selected.

¹²² Ex. 83 at 9 (Stevenson Direct).

¹²³ Ex. 303 at 14-16 (Rakow Rebuttal).

¹²⁴ Ex. 1 at Apx. A-2 (Application) See *also*, Ex. 1 at 7.24 (Application).

¹²⁵ Ex. 94 at 23-25 (King Direct).

¹²⁶ Ex. 282 at 70, 82-83 (Rakow Direct).

¹²⁷ Ex. 1 at 7.24 (Application).

¹²⁸ Ex. 1 at 7.36-7.37 (Application); Ex. 94 at 25-26 (King Direct).

117. The first segment would run from the Monticello Substation at the Monticello Power Plant site to a new substation, Quarry Substation, on the western side of St. Cloud, approximately 30 to 40 miles. The new 345 kV line would connect with the existing 115 kV transmission system that serves the St. Cloud area.

118. The second segment would run from the Quarry Substation to a substation near Alexandria, connecting with the existing 115 kV transmission system serving west central Minnesota, including the City of Alexandria, either at an existing substation or a new substation near Alexandria. This segment would be approximately 60 to 80 miles long.

119. The third segment would run from Alexandria to a substation near Fargo, North Dakota. This segment would be approximately 120 to 150 miles long. Initially, the Applicants proposed that the new 345 kV line would terminate at the Maple River Substation, northwest of Fargo.¹²⁹

120. During the proceeding, the Applicants requested the flexibility to terminate the northwestern end of the line at a new substation. The Maple River Substation is located within a growing residential area and it is congested with multiple transmission lines. A new substation farther from the City of Fargo may also simplify the routing of the new line. The Maple River Substation is the least cost option; the estimated incremental cost of building a new substation is \$20 million.¹³⁰ Applicants request that the certificate of need allow for termination in the vicinity of Fargo without specifying the end point so that the Applicants can explore the most appropriate endpoint in conjunction with the North Dakota Public Service Commission and the route the line will take in North Dakota.¹³¹

121. No party objected to deferring identification of the northwestern termination of the Fargo Project to allow the benefits of a new substation to be weighed against the incremental cost.

122. The Applicants' Upsized Alternative for the Fargo Project is to construct the entire length of the route using 345 kV/345 kV structures, with only one side strung and operated at 345 kV.¹³² This option was developed in response to the direct testimony of OES witness, Dr. Steve Rakow, and CETF witness, Larry Schedin. Both witnesses expressed their opinion that the Fargo Project should be larger than the original proposed project in order to provide the potential for additional transfer capability and long-term benefits. In his direct testimony, Mr. Schedin recommended that the Fargo Project be constructed as a double-circuit 345 kV configuration. In his direct testimony, Dr. Rakow recommended that the Fargo Project be constructed with a

¹²⁹ Ex. 1 at 2.5 and Figure 2-2: "Map of Twin Cities – Fargo 345 kV Project Area" (Application); Ex. 83 at 11-16 (Stevenson Direct).

¹³⁰ Ex. 312 at 3 (Kline Final Rebuttal).

¹³¹ Ex. 312 at 1-4 (Kline Final Rebuttal).

¹³² Ex. 121 at 10 (Grivna Rebuttal); Ex. 22.

single-circuit 500 kV configuration. Based on these recommendations, the Applicants reviewed their initial analysis and offered the Upsized Alternative.¹³³

123. The Applicants are not requesting the authority to operate a double-circuit 345 kV line at this time. There are other facilities that limit double-circuit operation, particularly the Minnesota Valley–Blue Lake 230 kV line.¹³⁴ The Upsized Alternative includes double-circuit compatible structures so that the second circuit may be added when circumstances warrant. A single-circuit 345 kV line will provide reliable service to the southern Red River Valley, Alexandria and Saint Cloud. Operating a second circuit immediately would not significantly increase regional reliability.¹³⁵

124. Timing of the Fargo Project: The projected service date for segments of the Fargo Project is 2011-2015. No party objected to the timing.

125. Cost of the Fargo Project: The estimated cost for the project is between \$390 and \$560 million, affected by the timing of construction, availability of construction crews and components, and the route selected by the Commission. The low end assumes a 210-mile route built as a single circuit. The high end of the range represents a 270-mile route with approximately 180 miles of double circuiting with existing transmission lines. The cost of the Upsized Alternative, with only one side strung and operated at 345 kV, is estimated to be \$500 million to \$640 million (an increase of \$80 to \$110 million).¹³⁶

126. Alternatives Considered by the Applicants: The Applicants considered system configuration alternatives including higher voltage and lower voltage lines, upgrading or double-circuiting, and using generation as an alternative to transmission. Nine 115 kV lines would be needed to provide capacity comparable to the 345 kV line. Lower voltage lines were evaluated in the TIPS Update as well and were not adequate to meet the all of the identified needs: the 345 kV option will provide a new 345 kV source on the western side of the St. Cloud region and additional support to the southern Red River Valley, as well as strengthen the backbone transmission system in the region.¹³⁷

127. No-Build Alternative: The Applicants also considered a “no-build” alternative and determined that the current level of transmission support in the southern Red River Valley, Alexandria, and St. Cloud was not capable of providing reliable service.¹³⁸

¹³³ Ex. 121 at 10-12 (Grivna Rebuttal).

¹³⁴ Ex. 70 at 10 (Kline Rebuttal).

¹³⁵ Ex. 70 at 7-9 (Kline Rebuttal).

¹³⁶ Ex. 83 at 16 (Stevenson Direct); Ex. 88 at 4 (Stevenson Rebuttal) (The Applicants did not clarify whether a portion of the Upsized Alternative would be double-circuited with existing transmission lines). See Attachment F to this Report.

¹³⁷ Ex. 67 at 16-17 (Kline Direct); Ex. 70 at 2 (Kline Rebuttal); Ex. 1 at 7.24-7.25 (Application).

¹³⁸ Ex. 67 at 18-19 (Kline Direct).

Brookings Project Description

128. The Brookings Project includes a series of 345 kV segments between the Brookings County Substation in South Dakota, to a proposed new substation at Hampton Corner in the southeast corner of the Twin Cities, with a series of connections along the proposed transmission line with the existing transmission system. The Brookings Upsized Alternative refers to the alternative proposed by the Applicants in their Rebuttal Testimony. The Applicants are asking the commission to grant a certificate of need for either alternative but Applicants prefer the Upsized Alternative. Both the Brookings Project and the Upsized Alternative are illustrated on Exhibit 23, Attachment B hereto. The overall length of the project between Brookings County and the Twin Cities would be approximately 165 to 200 miles, depending on the route selected.¹³⁹

129. The Applicants' primary purpose for the Brookings Project is to provide additional generation outlet from wind-rich southwestern Minnesota. It estimates that the project will increase generation outlet capability in Buffalo Ridge by 700 MW.¹⁴⁰

130. The western-most segment of the project would be a 345 kV circuit between two existing substations, Brookings County Substation and Lyon County Substation near Marshall. This segment would be approximately 50 to 55 miles long.

131. The project would also include an approximately 25-mile, 345 kV circuit from the Lyon County Substation to the Hazel Creek Substation southwest of Granite Falls. This segment would replace an existing 115 kV circuit and would connect with existing transmission lines at the Hazel Creek Substation. If this Project is approved and the Big Stone II line is constructed, the Big Stone II line would also connect at the Hazel Creek Substation and could operate at 345 kV standards. The Hazel Creek Substation would also provide voltage support in the western part of the state as more wind farms are developed.¹⁴¹

132. The project includes an eight to ten mile segment between the Hazel Creek and Minnesota Valley Substations. This would replace a segment of the existing Lyon County–Minnesota Valley 115 kV circuit. In their Application, the Applicants proposed constructing this segment as a 230 kV line. However, during the proceeding, they revised their proposal to construct the line to 345 kV line standards and operate it initially at 230 kV until other upgrades in the area occur that require conversion to 345 kV. The Applicants anticipate that the Minnesota Valley to Blue Lake 230 kV line will need to be replaced or upgraded in the near future to accommodate the increased demand for renewable generation. Constructing the Hazel Creek to Minnesota Valley

¹³⁹ Ex. 1 at 2.6-2.8 (Application); Ex. 116 at 2-4 (Lennon Direct).

¹⁴⁰ Ex. 1 at 6.39, 6.50 (Application); Ex. 104 at 5 (Alholinna Direct).

¹⁴¹ The 115 kV portion of the Hazel Creek Substation is being constructed as part of the Buffalo Ridge Incremental Generation Outlet (BRIGO) project. The 230 kV and 345 kV portions would be part of this project. Ex. 116 at 3 (Lennon Direct).

segment of this project at 345 kV standards will increase the capability of a Minnesota Valley-Blue Lake upgrade.¹⁴²

133. The Project includes a 45-mile double-circuit 345 kV line between the Lyon County Substation and the Franklin Substation or a new substation in that area, and a 45-mile double-circuit segment between the Franklin area and a new Helena Substation in the vicinity of New Prague. The Helena Substation would connect the proposed double-circuit line and the existing Blue Lake–Wilmarth 345 kV line.¹⁴³

134. There are two additional 345 kV single-circuit segments. One segment, approximately 20 to 30 miles long, would extend from the Helena Substation to the Lake Marion Substation in Lakeville, along the I-35 freeway corridor. The second segment, approximately 25 miles long, would extend from the Lake Marion Substation to the proposed new Hampton Corner Substation that is also included in the La Crosse Project.¹⁴⁴

135. The Upsized Alternative would retain the proposed double-circuit segments of the project, from Lyon county to Franklin and Franklin to Helena, and upgrade all of the other segments to be double-circuit compatible: from Brookings to Lyon County, from Lyon County to Hazel Creek, from Hazel Creek to Minnesota Valley, and from Helena to Lake Marion and Lake Marion to Hampton Corner.¹⁴⁵

136. At this time, the Applicants are requesting authority to operate double-circuit 345 kV lines only on the segments identified in the Application and not on the additional upsized segments.

137. Eastern Termination of the Brookings Project. CETF has challenged the proposed eastern termination of the Brookings Project at the new Hampton Corners Substation.¹⁴⁶ The Applicants have fully explained the proposed connection at Lake Marion but have not explained the benefit of the extension farther east to Hampton Corners.¹⁴⁷ However, the Lake Marion-Hampton Corners segment was included in the Southwestern Minnesota Study base plan and the related power flow analysis.¹⁴⁸ Based on this record, it is not clear whether the segment is necessary for regional reliability or to achieve 700 MW of generation outlet capacity.

¹⁴² Ex. 104 at 13-14 (Alholinna Direct); T. 10 at 154-155 (Alholinna); Ex. 307 at 27 (Rakow Surrebuttal); Ex. 175 at 12 (Schedin Rebuttal).

¹⁴³ Ex. 116 at 3-4 (Lennon Direct).

¹⁴⁴ Ex. 1 at 2.6-2.8 and Figure 2-3: “Map of the Twin Cities – Brookings County 345 kV Project” (Application).

¹⁴⁵ Ex. 120 at 4-5 (Lennon Rebuttal). Ex. 116 at 4 (Lennon Direct); Ex. 23.

¹⁴⁶ CETF Reply Brief at 11.

¹⁴⁷ Ex. 104 at 8-10, 16 (Alholinna Direct).

¹⁴⁸ Ex. 1 at Apx. A-4 at 8-9, 25, 39. OES evaluated the Brookings Project configuration but there is no specific mention of the Lake Marion to Hampton Corners Segment. Ex. 282 at 65-68 (Rakow Direct).

138. Timing of the Brookings Project. The Project is expected to be completed and in service in 2012 for the Lyon County to Franklin and Franklin to Helena segments, and 2013 for all other segments.¹⁴⁹ No party objected to the timing.

139. Cost of the Brookings Project. As proposed, including the 345 kV line from Hazel Creek to Minnesota Valley, the estimated cost is \$603.7 to \$669.6 million.¹⁵⁰ The cost of the Upsized Alternative is estimated to be \$654 to \$725 million (an increase of \$51 to \$55 million).¹⁵¹

140. Alternatives to the Brookings Project. As part of the Southwestern Minnesota Study, a number of alternatives were evaluated, including lower voltage options. Also, after the study, planning engineers examined a single-circuit alternative, referred to as the “West Waconia Alternative,” bypassing the proposed Franklin Substation connection. In addition, since the Southwestern Minnesota Study and the addition of new facilities, there has been further analysis to identify improvements that could provide significantly more outlet capability in Southwestern Minnesota. These studies confirmed both that the Brookings Project was the best-performing option, and identified the need to improve the Minnesota Valley to Blue Lake 230 kV line.¹⁵²

141. No Build Alternative. The primary purpose of the Brookings Project, to increase generation outlet, cannot be met without new transmission capacity.

Common Characteristics of the Proposed Projects

142. A high voltage transmission line circuit consists of three phases, each at the end of a separate insulator string, all physically supported by structures. Each phase consists of one or more conductors. When more than one conductor is used to make up a phase, the term “bundled” conductors is used. Conductors are metal cables consisting of multiple strands of steel and aluminum wire wound together. There are also two shield wires strung above the electrical phases to prevent damage from lightning strikes. The shield wire may also include fiber optic cable for communication along the transmission line. A double-circuit transmission line carries two circuits or six phases and normally two shield wires.¹⁵³

143. For all the 345 kV single-circuit and double-circuit transmission lines included in the three projects, Applicants propose to use two 954 Aluminum Conductor Steel Supported (ACSS) cables per phase or conductors of comparable capacity. For the 161 kV portions of the La Crosse Project, a single conductor using 795 ACSS cable or a conductor of comparable capacity will be used.¹⁵⁴

¹⁴⁹ Ex. 311.

¹⁵⁰ The cost to upgrade from a 230 kV line to a single-circuit 345 kV line included in the Applicants’ Direct Testimony is \$3.7 to \$4.6 million. Ex. 116 at 9 (Lennon Direct).

¹⁵¹ See, Attachment F to this Report; Ex. 120 at 4-5 (Lennon Rebuttal).

¹⁵² Ex. 104 at 11-18 (Alholinna Direct); Ex. 1 at 7.7, 7.25, and Apx. 4 at 8-9 (Application).

¹⁵³ Ex. 1 at 2.9-2.11 (Application).

¹⁵⁴ Ex. 1 at 2.10 (Application).

144. Applicants propose to use primarily single steel-pole structures for the 345 kV lines. Single-circuit steel-pole 345 kV structures vary in height from 105 to 150 feet depending on the span between structures. Double-circuit structures for either two 345 kV lines or a 345 kV and 161 kV line vary from 130 to 175 feet tall. Spans between structures can vary from 750 to 1,100 feet. Structures for a single-circuit 161 kV line are typically 70 to 105 feet tall with a 600 to 900 foot span.¹⁵⁵

145. Both a single-circuit 345 kV line and a double-circuit 345 kV line require a 150-foot right-of-way. A 161 kV line requires 70 to 80 feet of right-of-way. The right-of-way may be narrower where it follows a pre-existing transmission line, road, or pipeline corridor.¹⁵⁶

146. Applicants anticipate that the transmission towers will typically be single pole steel design, set on a concrete foundation approximately six to 12 feet in diameter and 15 feet deep.¹⁵⁷

147. The Applicants estimate that the per-mile construction cost is \$1,109,000 for a single-circuit bundled 345 kV line with a 954 ACSS conductor, and \$1,880,000 for the double-circuit bundled 345 kV line with a 954 ACSS conductor.¹⁵⁸ Although the Applicants included cost estimates of the Upsized Alternative for each CapX project, the per-mile construction cost for the Upsized Alternative with single-circuit bundled 345 kV line strung was not included.

148. The estimated service life of the transmission lines may vary. Although assigned a limited life for accounting purposes, transmission lines are seldom completely retired. With the exception of severe weather such as tornados and ice storms, transmission lines rarely fail. The average annual availability of transmission infrastructure is in excess of 99 percent.¹⁵⁹

149. Transmission lines have rare maintenance outages. The principal operating and maintenance cost for transmission facilities is the cost of inspections, usually done monthly by air and on the ground once a year. If wood structures are used, more detailed inspection is required about once every ten years. Annual operation and maintenance expenses average about \$300 to \$500 per mile. Substations require equipment and site maintenance.¹⁶⁰

Lower Voltage Upgrades

150. When substantial high voltage additions are planned for the transmission system, the engineers analyze the performance of the lower voltage network to identify lower voltage circuits that may be overloaded by the addition of new facilities. The

¹⁵⁵ Ex. 1 at 2.10-2.11(Application).

¹⁵⁶ Ex. 1 at 2.9 (Application).

¹⁵⁷ Ex. 1 at 9.7 (Application).

¹⁵⁸ Ex. 186.

¹⁵⁹ Ex. 1 at 9.16 (Application).

¹⁶⁰ Ex. 1 at 9.16-9.17 (Application).

planning engineers develop a list of the underlying system improvements needed to support the high voltage additions. For CapX, the planning engineers used computer simulations with year 2012 system parameters and identified numerous lower voltage circuits that could be overloaded. The Applicants included a list of the lower voltage system upgrades required by the three projects and estimate that the upgrades will add \$70 million to \$100 million to the projects' cost. The upgrades were not broken out among the three projects.¹⁶¹ The Upsized Alternative did not change the necessary lower voltage upgrades because no new circuits will be added immediately.¹⁶²

Evaluation of Criteria for Certificate of Need

151. The criteria for evaluating an application for a certificate of need are set forth at Minn. Stat. § 216B.243, and elaborated at Minn. R. 7849.0120. Each of the rule criteria is addressed below. The Applicants have asserted that each CapX project is necessary to address three separate needs: to improve overall system reliability, to assure reliable service to local communities, and to increase generation outlet capacity.¹⁶³ The burden is on the Applicants to show that there is the asserted level of need.

A. The Probable Result of Denial Would Be an Adverse Effect Upon the Future Adequacy, Reliability, or Efficiency of Energy Supply to the Applicant, to the Applicant's Customers, or to the People of Minnesota and Neighboring States, Considering:

A (1). Accuracy of the Applicants' Forecast of Demand for the Type of Energy that Would be Supplied by the Proposed Facility.

Regional Reliability

152. Reliability standards are determined by the North American Electric Reliability Council (NERC). The reliability standard has two components: the system must be adequate to provide customers with a continuous supply of electricity at the proper voltage and frequency virtually all of the time, and the system must be "secure," which means that the bulk power system must have the ability to withstand sudden, unexpected disturbances from natural or man-made causes.¹⁶⁴

153. NERC reliability standards require that a system be adjusted in order to withstand the "next" contingency. Thus, in its planning, when one component of the system is down, transmission planners examine the steps that must be taken to shift or reduce load if the loss of another component would result in overloading, even if the probability of the second loss is low.¹⁶⁵

¹⁶¹ Ex. 1 at 2.17-2.19 and Figure 2-14 (Application); T. 11 at 130 (Lennon).

¹⁶² Ex. 121 at 16 (Grivna Rebuttal).

¹⁶³ Ex. 1 at 3.25-3.26 (Application).

¹⁶⁴ Ex. 257 at 6-7 (Ham Direct) (citations omitted).

¹⁶⁵ Ex. 56 at 21 (Webb Direct); T. 5A at 31-35 (Webb).

154. Minnesota's need for additional transmission facilities is determined in part by the role that its interconnected facilities play in supporting regional reliability of the transmission system. Each of the three projects terminates in communities just across the Minnesota border and the three projects will support those communities as well as Minnesota communities. While the emphasis in the application is service to Minnesota customers, the nature of the transmission system requires an analysis that is regional. Minnesota has consistently imported electricity for many years (in 2006, about 16 percent). Appropriate interstate transmission can provide Minnesota with reliable and reasonably priced energy.¹⁶⁶

155. The Federal Energy Regulatory Commission (FERC) has authority over the transmission of electric energy in interstate commerce and wholesale sales of electricity, including regulating transmission rates and practices and authorizing and overseeing the operation of regional transmission organizations. Under the Energy Policy Act of 2005, it is also responsible for oversight of NERC reliability standards. MISO oversees and coordinates regional transmission planning and services and manages access to the transmission grid in the Midwest region. It is actively involved in studying transmission needs and expansion requests in order to serve existing and forecasted load and to meet demand for renewable energy mandates.¹⁶⁷

156. Minnesota utilities file Integrated Resource Plans (IRPs) with the Commission approximately every two years, predicting demand and energy consumption over a 15-year forecast period.¹⁶⁸

157. The Mid-Continent Area Power Pool (MAPP) is a voluntary association of Upper Midwest electric utilities and other electric industry participants. Its functions include responsibility for facilitating open access of the transmission system. Each year Minnesota utilities submit to MAPP a Load and Capability Report, which is a 10-year forecast estimating a utility's seasonal customer demand and what generation facilities the utilities will use to meet that demand.¹⁶⁹

158. Each forecast estimate discussed below is summarized on Revised Figure 6-6, Attachment E to this Report.

¹⁶⁶ Ex. at 1.4 (Application); Ex. 257 at 4-5 (Ham Direct); T. 22 at 169 (Ham).

¹⁶⁷ Ex. 56 at 4 (Webb Direct); T. 5A at 80 (Webb).

¹⁶⁸ See Minn. Stat. § 216B.2422.

¹⁶⁹ Ex. 1 at 6.5 (Application); Ex. 48 at 6 (Lacey Direct).

Applicants' Forecasted Load Growth

159. Forecasting uses historical information to make reasonable assumptions about the future. Changes in the economy, including a recession, may slow the anticipated growth, pushing out the year in which upgrades to the transmission system may be required, but there is no evidence that load growth will substantially slow or stop.¹⁷⁰

160. The Applicants' estimate of demand derives from the Vision Study. The study area selected for the Vision Study was primarily based on the geographic boundaries of the service territories of utilities that serve customers in Minnesota. Those systems include all of Minnesota and portions of North Dakota, South Dakota, Iowa, Wisconsin and Upper Michigan.¹⁷¹

161. To develop the forecast for the year 2020, planning engineers gathered 2009 summer peak forecast data from the 2004 MAPP model. They estimated the load level for 2009 to be 20,201 MW.¹⁷² Then they applied growth rates taken from MAPP Load and Capability Reports or, for three companies, Alliant Energy (West), GRE and Minnesota Power, from either their IRPs or the company. Based on the projected growth rates, the planning engineers estimated the demand to rise to about 26,500 MW by 2020, an increase of about 6,300 MW. The planners characterized this as the "expected growth" scenario.¹⁷³

162. Expected growth was estimated at 2.49 percent annually from 2009 through 2020, which is a decrease from the actual growth rate in the early 2000's of 2.64 percent.¹⁷⁴

163. In addition, the planning engineers ran an analysis assuming about 4,500 MW of growth, an approximately 29 percent reduction, described as the "slow growth" scenario. Under the slow growth scenario, peak system wide demand would reach approximately 24,700 MW in 2020.¹⁷⁵

164. In 2007, in preparation for the Application, the Applicants looked at the 15-year forecasts included in the IRPs filed by the utilities with the Commission. As part of this Application, the Commission required the Applicants to provide a summary description of the IRP filings and Commission Orders for each participating utility. The summary is included in Appendix C-6 of the Application.¹⁷⁶ Since some utilities do not file IRPs, the Applicants also reviewed 2006 MAPP Load and Capability data. Applicants compared the Vision Study forecasts with the IRPs and MAPP Load and Capability Reports approved by the Commission in 2005 and 2006. These confirmed

¹⁷⁰ T. 15 at 119-121 (Alders).

¹⁷¹ Ex. 1 at 6.3 and Fig. 6-1 (Application); Ex. 6 at 13 (Rogelstad Direct).

¹⁷² Ex. 48 at 4-5 (Lacey Direct).

¹⁷³ Ex. 48 at 4-6 (Lacey Direct).

¹⁷⁴ Ex. 1, Apx. A-1, at 1, 5. (Application).

¹⁷⁵ Ex. 48 at 4-6 (Lacey Direct).

¹⁷⁶ Ex. 2, Apx. C-6 (Application).

that the Minnesota utilities anticipated significant load growth between 2009 and 2020.¹⁷⁷ Using the combination of data from the two types of reports, Applicants projected a range of growth from 4,095 to 4,904 MW.¹⁷⁸

165. In response to Information Request No. 7 from NAWO/ILSR, Applicants prepared additional estimates to provide a demand forecast that incorporated the 1.5 percent conservation goals enacted in 2007.¹⁷⁹ Each utility has an annual energy-savings goal equivalent to 1.5 percent of gross annual retail energy sales. The conservation goals were not in effect when the Vision Study was conducted. The revised estimated load forecast was approximately 25,708 MW (medium) to 27,708 MW (high) by 2020, about 100 MW higher than the calculations used in the Vision Study.¹⁸⁰

166. The Applicants assert that the CapX projects are part of the plan to strengthen the transmission network to meet the forecasted demand under both the revised high and medium scenario.¹⁸¹

OES Forecast Analysis

167. OES reviews load forecasts as a part of many Commission proceedings. OES concluded that the Applicants' peak demand forecasts were reasonable.¹⁸²

168. OES witness Ham also conducted an independent analysis to verify the forecast. He obtained information from the Midwest Reliability Organization (MRO) 2007 Series summer peak model to update the 2004 MAPP data used by the Applicants. The updated figure was 22,228 MW peak demand in 2009, higher than the 20,201 forecast in the Vision Study.¹⁸³ Then Mr. Ham applied a growth rate from the most recently approved or accepted IRP from Minnesota utilities to obtain year 2020 summer peak demand.¹⁸⁴

169. Based on this information, Mr. Ham estimated 2020 peak demand to be 27,060 MW, about 572 more than the Applicants' expected growth forecast in its Vision Study (26,488 MW), and in between the high and medium revised forecasts (27,708 and 25,708). The results of this analysis were consistent with Mr. Ham's review of recent IRPs filed by Xcel Energy, Minnesota Power, Otter Tail Power and Interstate Power and Light, and with GRE's 2005 IRP. Mr. Ham concluded that these five companies serve the majority of Minnesota customers and all need additional capacity

¹⁷⁷ Ex. 1 at 6.7-6.8 (Application); Ex. 48 at 7-8 (Lacey Direct); Revised Figure 6-6, Attachment E to this Report.

¹⁷⁸ Ex. 1 at 6.9 (Application).

¹⁷⁹ Minn. Stat. § 216B.2401.

¹⁸⁰ Ex. 53 at 8 (Lacey Rebuttal); Revised Figure 6-6, Attachment E to this Report. The 2009-2020 increase was smaller than the base study because the base forecast for 2009 was higher.

¹⁸¹ Ex. 48 at 10 (Lacey Direct); Ex. 6 at 17 (Rogelstad Direct).

¹⁸² Ex. 257 at 14, 19 (Ham Direct); Ex. 274 at 1-2 (Ham Surrebuttal).

¹⁸³ Ex. 264; Revised Figure 6.6, Attachment E to this Report.

¹⁸⁴ Ex. 265.

and energy in the 2010-2015 timeframe. This was further corroborated by Mr. Ham's review of the MAPP Load and Capability Report issued on May 1, 2007.¹⁸⁵

170. In the course of this proceeding, Mr. Ham revised his calculations to take into account calculations by OES witness Davis of load reductions necessary to meet the 2007 conservation goals.¹⁸⁶ Since the historical conservation rates have been significantly lower than 1.5 percent, this was a reasonable proxy for the amount of additional energy the utilities could be expected to conserve through 2020.¹⁸⁷ Assuming that all the utilities met the 1.5 percent conservation goal, the cumulative incremental demand savings would be 1,370 MW. With 1.0 percent energy savings, the cumulative incremental demand savings would be 703 MW.¹⁸⁸

171. In addition to the projected conservations savings, Mr. Ham also took into account OES witness Peirce's calculation of the renewable energy generation needed to meet the 2007 RES Statute.¹⁸⁹

172. The RES Statute requires utilities to make a good faith effort to generate or procure "eligible energy technologies" in specified amounts by specified dates. OES calculated the amount of RES needed to meet those goals, using four scenarios:

- a. energy savings of 1.0 percent and a wind capacity factor of 30 percent;
- b. energy savings of 1.0 percent and a wind capacity factor of 40 percent;
- c. energy savings of 1.5 percent and a wind capacity factor of 30 percent;
- d. energy savings of 1.5 percent and a wind capacity factor of 40 percent.¹⁹⁰

173. The calculation took into account the utility's forecast, multiplied by the RES for each year in the forecast period, and then subtracted out the estimated amount of renewable energy each utility would have obtained by 2010.¹⁹¹

174. The wind capacity factor is the percentage of time that the facility's generation can be counted toward load serving, and the 30 to 40 percent rates for wind generation are consistent with the experience of the CapX utilities.¹⁹² Because wind is the largest renewable resource in Minnesota, OES used the wind capacity factor in the calculation.¹⁹³

¹⁸⁵ Ex. 257 at 9 (Ham Direct).

¹⁸⁶ Minn. Stat. § 216B.242, subd. 1.

¹⁸⁷ Ex. 215 at 2 (Davis Direct). OES regards the goal as aggressive but achievable. *Id.* at 2-3.

¹⁸⁸ Ex. 215 at 12-13 (Davis Direct). Calculations for local communities are discussed below.

¹⁸⁹ Minn. Stat. § 216B.1691.

¹⁹⁰ Exs. 253-255.

¹⁹¹ Ex. 261 at 6-17 (Peirce Direct); Ex. 247 at 4 (Peirce Surrebuttal).

¹⁹² Ex. 244; Ex. 2 at Apx. D-6 (Application); Ex. 261 at 17 (Peirce Direct).

¹⁹³ Ex. 231 at 19 (Peirce Direct). Ms. Peirce explained why she anticipated that most of the energy to meet the RES will come from wind energy. Ex. 247 at 1-3 (Peirce Surrebuttal).

175. The nameplate capacity of generation is the total amount of energy produced when the generator is operating at capacity. The “accredited” capacity is the amount of the nameplate capacity that can be relied upon to produce generation at full capacity within a given hour. The rates range from 10 percent to 36 percent, but most CapX utilities cite rates between 10 and 15 percent. OES used a rate of 13.5 percent, which fell in that range and was the rate used by Xcel Energy, the company with the largest wind capacity.¹⁹⁴

176. Based on these calculations, OES projected that Minnesota utilities will need an additional 3,160 to 4,927 MW of wind generation beyond their current commitments to meet the RES goals.¹⁹⁵ Increased conservation would not decrease the need for transmission to support renewable energy.¹⁹⁶

177. Taking into account both conservation and the renewable energy calculations in his analysis, Mr. Ham concluded that the Minnesota utilities will need 1,269 MW to 2,094 MW of non-renewable generation to serve Minnesota customers reliably through 2020, a total of 4,621 to 6,817 MW of additional generation.¹⁹⁷

178. The Applicants’ projected load figures may actually understate the forecast demand that should be used for planning purposes because significantly more peak demand is likely to be needed under extreme weather conditions. Thus, some projects for local areas may be needed sooner than projected.¹⁹⁸

179. No other parties offered a load forecast. Each forecast in the record is at or above the 24,701 MW slow-growth forecast in the Vision Plan upon which the engineering analysis was conducted. Both the Applicants’ revised medium growth forecast of 25,708 MW and the OES estimate of 25,690 to 26,357 MW exceed the level used in the Applicants’ analysis.¹⁹⁹

180. Although the Applicants have not completed an analysis of facilities needed at a level of forecasted growth lower than 24,701 MW in the slow-growth model, neither do they anticipate that the three projects included in the Application are sufficient to meet that need. Instead, the Applicants assert that these projects are a necessary first step to meet the forecasted load growth.²⁰⁰

MISO Analysis of Forecast

181. MISO conducted an independent evaluation of the CapX project. It relied upon the load forecasts provided by the load-serving utilities because its experience is that those forecasts are the most accurate and have been reviewed by state regulators. It also reviewed the reasonableness of the forecasts against trends, other models, and

¹⁹⁴ Ex. 231 at 20 (Peirce Direct).

¹⁹⁵ Ex. 247 at 4 (Peirce Surrebuttal).

¹⁹⁶ Ex. 231 at 26 (Peirce Direct); Ex. 215 at 1 2-16 (Davis Direct); Ex. 195 at 8 (Schedin Rebuttal).

¹⁹⁷ Ex. 274 at 2 (Ham Surrebuttal); T. 22 at 152 (Ham); Revised Figure 6.6, Attachment E.

¹⁹⁸ T. 22 at 151-153 (Ham).

¹⁹⁹ Revised Figure 6-6, Attachment E.

²⁰⁰ T. 1B at 70-71 (Rogelstad).

NERC studies to assure that the forecasts were sufficiently accurate for MISO to handle its planning responsibilities.²⁰¹ MISO also considered the CapX projects as part of its overall transmission expansion planning processes. MISO concurs that each of the CapX projects will be needed within the next five to seven years for overall system reliability and security.

182. In determining whether a specific project should be included in its expansion plan, MISO staff typically meets with a broad group of stakeholders including transmission owners, transmission customers, end-use customers, generation developers, and state regulators. Since the cost of transmission projects that provide regional reliability is spread broadly across MISO, the customers have a significant interest in assuring that the proposed transmission projects are needed and the best cost alternative. The CapX projects have been reviewed by the MISO stakeholders and included in MISO's base plans upon which longer term plans are being developed and analyzed.²⁰²

183. When the hearing record closed, the CapX projects were still under review by MISO, with expected board approval as part of its 2008 expansion plan.²⁰³

184. Each of the three CapX projects will strengthen the reliability of the transmission system, ensure adequate energy supplies to the Twin Cities and surrounding areas, enhance efficient transfer of power throughout MISO and support competitive pricing of electricity.²⁰⁴

Objections to the Load Growth Projections

185. NAWO/ILSR and CETF claimed that the Applicants' long-range forecast was no longer accurate, in part because Applicants failed to take into account recently enacted conservation goals and unanticipated declining consumption.²⁰⁵

186. Applicants provided updated forecasts that were verified by OES, taking into account both enhanced conservation and the RES. MCEA witness Schedin predicted that lower load growth may actually increase the need for the CapX projects to supply the necessary generation outlet to meet the RES because it is difficult to site large amounts of renewable generation near load.²⁰⁶

187. Reductions in load forecast could affect the MISO models, but because of the identified size of the overloads, and areas of voltage collapse, substantial reductions in the forecast ("a very wide, very, very significant change in forecast level") or

²⁰¹ T. 5A at 82-83 (Webb).

²⁰² Ex. 56 at 10 (Webb Direct); T. 5B at 29-30 (Webb).

²⁰³ Ex. 56 at 11-12 (Webb Direct). In its Reply Brief, MISO stated that the CapX Projects were included in MTEP 08, approved by its Board on December 4, 2008.

²⁰⁴ Ex. 56 at 37 (Webb Direct).

²⁰⁵ NAWO/ILSR Post-hearing Brief at 15, 21, citing T. 21 at 138 (Davis); CETF Posthearing Brief at 31.

²⁰⁶ Ex. 195 at 8-9 (Schedin Rebuttal).

significant addition of new generation would be required to significantly affect the need for the CapX projects.²⁰⁷

188. NAWO/ILSR contended that no engineering studies support the Applicants' lower forecasted demand. That is inaccurate. The loads included in the Vision Study modeling, 24,701 MW (slow growth) and 26,488 MW (expected growth), were within the range of Applicants' revised forecasts of 25,708 MW (medium) and 27,708 MW (high). Although the 2009 load forecast rose (reducing the size of the load growth), the modeling loads were consistent with the revised 2020 forecasts. Also, the studies showed that the system was not reliable at a level below the forecasted levels. Mr. Rogelstad's judgment was that the proposed projects would be necessary to address system-wide growth as well as local community needs even if demand growth through 2020 were as low as 2,000 MW, far below any of the estimates.²⁰⁸

189. CETF asserted that the 1.5 percent energy conservation estimates from Exhibit 217 could be applied to the lower demand forecasts in Exhibit 265, the approved integrated resource plan forecasts, reducing projected growth in 2020 to 3,163 MW.²⁰⁹ OES, the party that prepared those exhibits, did not agree with CETF's calculations. The 1.5 percent conservation calculation in Exhibit 217 was based on forecasted load. If the forecasted load were reduced, the resulting 1.5 percent calculation would also be lower. To take the higher conservation calculation and subtract it from a lower forecasted load would create an artificially low forecast. The OES analysis yielded significantly higher forecasts than the number posited by CETF.²¹⁰

190. Some parties and members of the public contended that the CapX projects were not necessary to serve Minnesota load and were a pretext to ship bulk power across Minnesota from the resource-rich states west of Minnesota to large urban centers to the east of Minnesota.²¹¹

191. The engineers credibly testified that the engineering studies evaluated Minnesota load-serving and not bulk transfer. MISO's witness, Mr. Webb, stated that its studies did not model injection of power from western source points to load east of Minnesota to determine whether the CapX project would accomplish that goal, but instead, it evaluated the reliability of constraints to serving Minnesota load over the next five to seven years. In his opinion, as designed and tested, CapX has minimal capacity for bulk transfer of power.²¹²

192. OES witness Rakow concurred that bulk transfer was not economical and that the vast majority of new capacity would serve Minnesota load.²¹³

²⁰⁷ T. 5A at 92-93 (Webb).

²⁰⁸ T. 2B at 84, 87; T. 3 at 83-85 (Rogelstad).

²⁰⁹ CETF Posthearing Brief at 17-18.

²¹⁰ OES Reply Brief at 29-30.

²¹¹ NoCapX Posthearing Brief; UCAN Posthearing Brief.

²¹² T. 5B at 58-64 (Webb).

²¹³ T. 25 at 73, 80 (Rakow).

193. NAWO/ILSR asserted that the Applicants failed to consider the potential energy savings from implementation of “Smart Grid” technology. Smart Grid technology has several components, including technology that provides more direct communication from fuel source to end use, providing immediate price information to encourage greater conservation and better performance of the distribution and transmission systems. NAWO/ILSR contends that Smart Grids can be expected to produce a 30 percent reduction in residential peak demand and ten percent reduction in residential energy consumption. NAWO/ILSR cites Xcel Energy projections of an additional 25 percent reduction in residential peak demand when Smart Grid is combined with “supply side” distributed generation.²¹⁴ However, its source is “Xcel Energy Smart Grid: A White Paper.”²¹⁵ At this time, the Smart Grid innovations are still in development. The purpose of the pilot project is to assess the benefits and the corresponding costs.

194. No specific Smart Grid alternative has been developed that would address each of the needs set forth in this Application, nor are there identified costs for any specific alternative.²¹⁶ Neither the Applicants nor OES considered that the results from Smart Grid demonstration projects were sufficiently quantifiable to include a corresponding reduction in demand in this proceeding. OES witness Davis included the possible use of Smart Grid as one of the tools for utilities to meet Demand Side Management (DSM) goals, but concluded that it was not sufficiently tested to include a specific forecast adjustment.²¹⁷

195. The La Crosse Project will improve regional reliability by creating a second 345 kV source to the Rochester area. In the event that the Prairie Island – Byron 345 kV line is out of service, the Hampton–North Rochester 345 kV transmission line could be relied upon to provide service.²¹⁸

196. The Fargo Project will increase the generation outlet across the North Dakota Export (NDEX), which may facilitate development of increased renewable generation in North Dakota and Minnesota, and it will provide back-up for the Dorsey-Forbes 500 kV line and Center-Jamestown 345 kV line.²¹⁹ It will provide a 345 kV source on the western side of the St. Cloud region and additional support to the southern Red River Valley, and strengthen the backbone transmission system in the region.

197. The Brookings Project will facilitate lower cost or renewable generation, ensure compliance with the NERC reliability standards, and relieve congestion on the transmission grid. The 825 MW provided by the Southwestern Minnesota project approved in 2003 and completed in 2008, and additional capacity associated with the BRIGO lines approved in 2007, provide a total of 1200 MW. That capacity is insufficient to accommodate all of the wind generation projects proposed in the Buffalo Ridge area.

²¹⁴ Ex. 148 at 46 (Michaud Rebuttal).

²¹⁵ Ex. 145.

²¹⁶ Ex. 133 at 2-3 (Alders Surrebuttal).

²¹⁷ T. 21 at 73, 127, 129 (Davis).

²¹⁸ Ex. 98 at 4 (King Rebuttal).

²¹⁹ Ex. 67 at 16-17 (Kline Direct); Ex. 70 at 2 (Kline Rebuttal); Ex. 199 at 12-13 (Schedin Surrebuttal).

The Brookings Project will provide an additional 700 MW of generation outlet, a total of approximately 1,900 MW, with a high capacity line from wind collection points to the Twin Cities. The Brookings Project will create an additional path from the Buffalo Ridge area to the east and avoid two current limiters on the system.²²⁰

198. In conducting its review of the CapX projects, MISO analyzed alternatives but did not identify any that would better serve either regional reliability or increased generation outlet for renewable energy.²²¹

199. NAWO/ILSR pointed out that the level of review necessary to fully analyze the Applicants' power flow and stability studies requires money and expertise that the intervenors cannot duplicate.²²² MCEA witness Schedin expressed similar concerns but noted that the project had been extensively reviewed by MISO and by personnel from the utilities. Mr. Schedin's limited review of selected output, his acquaintance with the professionals running the models and their qualifications, and the growing need for renewable generation outlets, reinforced his confidence in the accuracy of the modeling that supports the application. He recommended that the utilities and other model operators set up a consistent audit trail procedure in the future to allow careful review of their inputs and analysis.²²³

200. In summary, the Applicants have demonstrated that the CapX projects will improve the regional reliability of the transmission system to meet projected load growth.

Community Reliability

201. The need for improved community reliability led to development of the La Crosse Project and the Fargo Project. Although not part of the impetus for the project, the Brookings Project is also able to improve community service.²²⁴

Projected Load Growth for Rochester

202. The Applicants evaluated the load growth for the Rochester area. In 2006, the peak load at the Rochester area substations reached 330 MW. The reliable maximum transmission capacity available to serve the Rochester area is 181 MW. The available local generation is also about 181 MW. With the existing transmission support and local generation, the system can reliably serve 362 MW. Based on the forecasts, this load level will be exceeded in approximately 2011. With the failure of either generation or transmission, the level will be exceeded much sooner. There are also deficiencies on the system during off-peak, high transfer conditions. This has resulted in operating guidelines that limit the power that can flow south on the Prairie Island –

²²⁰ Ex. 104 at 3-5 (Alholinna Direct).

²²¹ T. 5B at 72-73 (Webb).

²²² Ex. 148 at 21-22 (Michaud Rebuttal).

²²³ Ex. 199 at 11-12 (Schedin Surrebuttal); see also, Exs. 182, 183.

²²⁴ Ex. 1 at 4.1-4.2 (Application).

Byron 345 kV line, to protect against overloading the system in the event of an outage along the Byron–Adams 345 kV line.²²⁵

203. Other projects are under consideration to serve Rochester. Based on the RIGO Study, Xcel Energy has developed a package of three new 161 kV lines (RIGO lines) that would alleviate certain limitations on the transmission system. The primary purpose of the RIGO lines is to increase generation outlet in southeastern Minnesota. The RIGO lines will also increase the capacity of the transmission system to 246 MW. With the addition of these facilities, the transmission system could adequately serve the area load until 2015.²²⁶

204. In addition, Dairyland Power intends to reconductor the Rochester–Adams 161 kV line to facilitate wind outlet. With the reconducting and the installation of the RIGO lines, the system could reliably serve load to 468 MW, a level expected to be reached in approximately 2018.²²⁷

205. The Applicant's projected 2020 load may be overstated. OES Witness Davis calculated the effect of the 2007 conservation goals which reduced the forecasted local need in Rochester by approximately 30 MW in 2020. Even with this reduction, the load exceeds the projected capacity of the transmission system.²²⁸

206. A new Hampton Corner 345 kV source enhances regional reliability by creating a second 345 kV source to the Rochester area. The Hampton Corner–North Rochester segment could reliably provide service if the Prairie Island–Byron 345 kV line is out of service. With the addition of the Hampton Corner–North Rochester segment of the La Crosse Project, the system would reliably serve load until approximately mid-century.²²⁹

207. The Applicants' projections assumed that current Rochester generation would be going down as facilities are scheduled to retire. In conducting its analysis, the Applicants assumed that there would be no local generation to serve load in 2020.²³⁰

208. OES examined information concerning the estimated supply capacity in 2009, expected additions and retirement of supply side resources, and each utility's purchases and sales of generation capacity.²³¹ RPU has plans to retire its current generation in the Rochester area by 2015 (a reduction of approximately 67 MW) and to seek permits for a new West Side Substation, connecting to new 161 kV lines. RPU is

²²⁵ Ex. 94 at 5-8 (King Direct); Ex. 219 at 1.

²²⁶ Ex. 94 at 21 (King Direct). Applicants' projected need: 426 MW. OES calculation with 1.5% energy savings: 411 MW (Ex. 219 at 1); T. 8 at 164 (King).

²²⁷ Ex. 94 at 21 (King Direct). Applicants' projected need: 492 MW. OES calculation with 1.5% energy savings: 461 MW (Ex. 219 at 1).

²²⁸ Ex. 219.

²²⁹ Ex. 98 at 4 (King Rebuttal).

²³⁰ Ex. 94 at 8-9 (King Direct).

²³¹ Ex. 220 at 2-3 (Shaw Direct); Ex. 222.

also considering adding gas generation, although no specific proposal was included.²³² None of the potential projects have received permits or have a date certain for coming into service.

209. NAWO/ILSR, CETF, and NoCapX correctly pointed out that if the level of generation in Rochester is maintained, the RIGO lines will provide reliable service to Rochester until 2026. OES concurred.²³³ At the time that the record in this proceeding closed, the application for a certificate of need for the RIGO lines had not been filed and there were no specific plans for new generation. Although installation of RIGO would postpone the need for the La Crosse Project to serve Rochester load, the La Crosse Project will also provide alternative 345 kV support to Rochester that will meet its needs for many years.²³⁴

210. For Rochester and other communities, NAWO/ILSR asserted that the Applicants had failed to assess whether the implementation of Smart Grid technologies would adequately address community reliability. As discussed above, Smart Grid approaches have not been sufficiently tested to include them in load forecasts, nor have the costs of implementing Smart Grid technologies in the local communities been estimated. Although Smart Grid holds promise for reducing load growth, the benefits are not yet quantifiable.

211. OES calculations of load growth with 1.5 percent conservation confirmed that Rochester's projected load would exceed critical load in 2011 and thereafter without additional generation or transmission capacity.²³⁵

212. Some members of the public expressed support for improving the reliability of service to Rochester. It has been several years since the city's infrastructure has been updated, and added capacity will encourage future economic development.²³⁶

Projected Load Growth for La Crosse

213. At the present time, power to the Winona/La Crosse area is provided by four 161 kV lines and the capacity of the system is dependent in part on the generation plants in the area.²³⁷ The forecast data show that the demand for power will exceed the capacity of the transmission system in 2009 under certain contingencies and will exceed its capacity by 68 MW in 2015. The reliability is significantly dependent on the operation of coal plants in Alma and Genoa. The French Island units in La Crosse also provide part of the generation serving this area. Two of the French Island units, 13 MW each,

²³² Ex. 222 at 11 of 23; T. 22 at 19-22 (Shaw). Ex. 157, "Report on the Electric Utility Baseline Strategy for 2005-2030 Electric Infrastructure," Summary, Parts II and IV, June 2005, prepared for RPU. Does not include specific planning commitments.

²³³ OES Reply Brief at 43, citing T. 9 at 111 (King).

²³⁴ Ex. 99 at 2 (King Surrebuttal).

²³⁵ Ex. 219 at 1.

²³⁶ Public Hearing Transcript (Pub. T.), Tab 19, Koshire, Reichert (Rochester); Tab 18, Eckerman (Rochester); Pub. Exs. 33, 34.

²³⁷ Ex. 1 at 4.7-4.16 (Application); Ex. 94 at 9-12 (King Direct).

burn refuse and operate on weekdays when trash is picked up. The other two units, 70 MW each, run on fuel oil which is expensive and possibly limited by environmental permitting. Thus, the transmission planners did not consider the 70 MW units to be routinely on line in their planning. The outage of any of the coal plants also significantly affects the amount of power than can be delivered to the area.²³⁸

214. The studies that preceded the application concluded that a 345 kV line would provide the best support to meet forecasted load of 640 MW in the Winona/La Crosse area through 2023.²³⁹

215. OES revised the load estimate, taking into account the impact of the 2007 conservation statute. It estimated load at 539 MW with 1.5 percent conservation savings. OES calculations confirmed that La Crosse's projected load would exceed critical load in 2010 and thereafter without additional generation or transmission capacity.²⁴⁰

216. The Applicants updated their modeling to include 2011 summer peak load from the 2066 MAPP Series. That MAPP series also included anticipated transmission infrastructure improvements.²⁴¹

217. The transmission system is sufficient to withstand the loss of the Genoa to Coulee transmission line if the French Island Units 3 and 4 are operating, but the system is not sufficient to prepare for the contingent loss under NERC standards of any additional facility. The planning engineers reasonably concluded that the French Island Units 3 and 4 could not be counted upon to be operating at all times.²⁴²

218. NAWO/ILSR asserted that the lower voltage system could be upgraded to improve reliability and load serving, and could be substantially reinforced with additional cost-effective generation at French Island. However, it did not provide any evidence of the cost to repower the French Island units or whether the 161 kV upgrades would be sufficient to meet the projected need under NERC contingencies.²⁴³

MISO Review of the La Crosse Project

219. MISO reviewed the projected loadings and voltage conditions in the Rochester and La Crosse areas for the 2011 summer peak period and also at somewhat higher levels. Like the Applicants, MISO anticipated that some of the available local generation in Rochester may be retired, but even with all generation available, there would be numerous line overload conditions. The potential overloading of the Byron to Maple Leaf 161 kV line was of particular concern.

²³⁸ Ex. 1 at 4.9-4.16 (Application).

²³⁹ Ex. 94 at 14 (King Direct); Ex. 98 at 7 (King Rebuttal).

²⁴⁰ Ex. 219 at 2.

²⁴¹ Ex. 11 at 3-4 (Response to NAWO/ILSR IR 16, Mar. 26, 2008).

²⁴² T. 9 at 123-123 (King); Ex. 103.

²⁴³ Ex. at 23 (Michaud Direct) (“(t)he alternative of adding just the 161 system upgrades, which appear to be those shown on p. 144 of Appendix A-2 for a cost of \$32 million, may be a cost effective solution to the 2020 time frame load serving issues.”)

220. Several scenarios that led to overloading involved either two line outages or one line outage and significant generation off line. Planning for the second contingency is consistent with NERC standards. MISO concluded that a new North Rochester substation with a step down transformer between the 345 kV Prairie Island to Byron 345 kV line and the proposed 161 kV line from North Rochester to Northern Hills would parallel the Byron transformer and the Byron to Maple Leaf 161 kV line.²⁴⁴

221. Although the Applicants have proposed to run the 345 kV line from a new Hampton Corner substation rather than from Prairie Island, each provides the same load-serving benefits.²⁴⁵

222. MISO considered the alternative of installing a second Byron transformer and new Byron to Northern Hills 161 kV line. This would provide similar benefits to Rochester at similar cost but would not address reliability in the La Crosse area.

223. MISO also reviewed the projected reliability in the La Crosse area and identified several reliability issues at the load projected for the 2011 summer peak, 492 MW. Each of these potential problems is summarized by MISO witness Webb. The addition of a strong 345 kV source into the area will relieve the worst loading conditions for many years.²⁴⁶ MISO considered the system operation with the 70 MW peaking plants on line and rebuilding the 161 kV lines in the area, but these options did not provide the same level of support to meet NERC standards or did not provide comparable ability to accommodate future load growth.

224. MISO concluded that the La Crosse Project would address future reliability in the Twin Cities and surrounding area and improve local reliability in Rochester and La Crosse for many years.²⁴⁷

225. NAWO/ILSR and CETF correctly pointed out that the contingencies identified by Mr. Webb assume that the two French Island 70 MW peaking plants are off line, and most of the scenarios also project loss of both a transmission line and one of the large coal generating plants, either Alma or Genoa.²⁴⁸

226. Although CETF and NAWO/ILSR opposed granting the certificate of need for the La Crosse Project, they apparently accept that a number of the proposed upgrades to the 161 kV system, including some that are already completed and may be included in the Project cost, are necessary to assure the system's reliability.²⁴⁹

227. At the public hearing in Winona, Brian Krambeer, President, Tri-County Electric Cooperative, spoke in favor of the La Crosse Project to ensure reliable service to its customers and support development of renewable energy projects in southeastern

²⁴⁴ Ex. 56 at 27-28 (Webb Direct).

²⁴⁵ Ex. 11 at 3 (Response to NAWO/ILSR IR 16 (Rev. & Supp.), Mar. 26, 2008).

²⁴⁶ Ex. 56 at 30-31 (Webb Direct).

²⁴⁷ Ex. 56 at 32 (Webb Direct).

²⁴⁸ Ex. 56 at 31 (Webb Direct).

²⁴⁹ See CETF Proposed Findings of Fact 288 and 292, citations omitted, and footnote 274, citing Ex. 11 and Ex. 1, Apx. A-2 at 144 (Application).

Minnesota.²⁵⁰ Tim Noeldner, a professional engineer employed by Wisconsin Public Power, Inc., also lent support to the La Crosse Project.²⁵¹

228. Jai Johnson, La Crosse City Council Member, opposed CapX and asserted that it will impede the development of local projects, including renewable energy.²⁵² Dr. Carrie Jennings, Eureka Township Supervisor, supported small, local generation to improve the electrical system and enhance the local economy.²⁵³

229. MCEA witness Schedin concluded that the certificate of need for the La Crosse Project was justified to serve the local area needs of Rochester and La Crosse.²⁵⁴

Load Growth in the Red River Valley

230. The TIPS Update identified reliability issues in the northern and southern Red River Valley. The application for a certificate of need for the Bemidji to Grand Rapids 230 kV transmission line addresses reliability issues for the northern Red River Valley through 2020.²⁵⁵

231. In the TIPS Update, planning engineers evaluated the southern Red River Valley actual system peak in the 2003/2004 winter period, and determined that the system could reliably serve an additional 330 MW beyond the peak, a total of 1,360 MW. The engineers determined that the loss of the Center–Jamestown portion of the Center–Jamestown–Maple River 345 kV line would severely limit the capacity of the system and cause unacceptably low voltages in some areas. They determined that local generation was relatively small and scarce and not a viable option. In 2005, 2006, and 2007, the Center–Jamestown segment experienced unplanned outages. Substation data also showed that the system’s capabilities could be exceeded in 2016 to 2019.²⁵⁶

232. During the summer of 2007, additional forecasting was done for the CapX application, including an evaluation of load forecasts for individual utilities in the Fargo study area.²⁵⁷

233. CETF claimed that the forecasted winter peak demand through 2020 was overstated.²⁵⁸ However, OES witness Davis took into account 1.5 percent conservation savings and projected that the forecasted load would exceed the critical load level by 2011 or earlier.²⁵⁹ No witness offered calculations that refuted Mr. Davis. As noted

²⁵⁰ Pub. T., Tab 16, Krambeer (Winona); Pub. Ex. 30B.

²⁵¹ Pub. T., Tab 17, Noeldner (Winona); Pub. Ex. 31.

²⁵² Public Comment (Pub. Comm.), Johnson, filed 7/31/08, #5405084.

²⁵³ Pub. Comm. Jennings, filed 9/22/08, #5518689. *See also*, Ninneman, Cure, filed 10/07/08, #5554862.

²⁵⁴ Ex. 177 at 35 (Schedin Direct).

²⁵⁵ T. 6 at 161 (Kline).

²⁵⁶ Ex. 1 at 4.16-4.26 (Application); Ex. 67 at 3-7 (Kline Direct).

²⁵⁷ T. 6 at 146 (Kline).

²⁵⁸ CETF Post-hearing Brief at 42.

²⁵⁹ Ex. 215 at 15 (Davis Direct); T. 21 at 61 (Davis).

above, the load forecasts used by Applicants and calculated by OES may actually understate the need because the forecasts did not take into account extreme weather.²⁶⁰

Load Growth in Alexandria

234. The Alexandria area was also analyzed in the TIPS Update. The conclusion was that the 115 kV system needed improvement between 2011 and 2014 to meet growing demand, the latter date dependent upon the availability of a 7.8 MW generator at the Poleyard Substation. Loss of any one of the three 115 kV lines serving the area could result in low voltages when demand exceeds 171 MW, the level expected by about 2011.²⁶¹

235. Al Crowser, general manager, Alexandria Light & Power, testified at the public hearing in support of the CapX projects. He stated that the Alexandria area is at a “seam” between the control areas of Otter Tail Power and Xcel Energy and has experienced occasional voltage dips and voltage swings from ice storms in the eastern Dakotas and the Red River Valley. He was pleased to see the utilities cooperating with each other to better serve the area. Mr. Crowser also noted that there is significant interest in conservation and load management, but that it is not estimated to exceed projected load growth.²⁶² Brian Zavesky, Senior Transmission Engineer, Missouri River Energy Services (MRES), Sioux Falls, South Dakota, also supported the CapX projects. His company is a supplemental supplier of power to Alexandria Light and Power, and believes efforts to upgrade the current system are a “band-aid” until the CapX projects can be constructed. He also commented on the difficulty that wind developers have gaining interconnection to the transmission system.²⁶³

236. NAWO/ILSR argued that the Alexandria area need can be met through 2020 with a combination of demand side management, using Smart Grid and other incentives, and the benefits of the proposed Bemidji–Grand Rapids 230 kV line.²⁶⁴ However, the Smart Grid technologies are not fully tested nor did NAWO/ILSR propose a specific alternative for Alexandria, with estimated costs and timeframe.²⁶⁵

237. OES calculations of load growth with 1.5 percent conservation confirmed that Alexandria’s projected load could exceed critical load by 2015 and thereafter without additional generation or transmission capacity.²⁶⁶

²⁶⁰ T. 22 at 153 (Ham).

²⁶¹ Ex. 1 at 4.26-4.30 (Application); Ex. 67 at 8-9 (Kline Direct).

²⁶² Pub. T., Tab 3, Crowser (Alexandria), and Pub. Hrg. Ex. 2.

²⁶³ Pub. T., Tab 3, Zavesky (Alexandria), and Pub. Hrg. Ex. 3. *See also*, Tab 4, Banke, Melrose, and Pub. Hrg. Ex. 4.

²⁶⁴ Ex. 148 at 49-50 (Michaud Rebuttal).

²⁶⁵ *See e.g.*, T. 21 at 127, 129 (Davis).

²⁶⁶ Ex. 219 at 4.

Load Growth in St. Cloud

238. The projected need for new transmission to St. Cloud was not opposed by any of the parties except NoCapX and UCAN, although neither of the two offered any evidence into the record that would counter the Applicants' evidence of need. There has been significant growth in population in the St. Cloud area. The Verso Paper Mill, with its associated load of 89 MW, is served through the St. Regis Substation. In the event of loss of the double-circuit line between Benton County and Granite City during summer peak loading, the Granite City–St. Regis 115 kV radial line is automatically tripped off, and the loss of the double circuit line also limits the capacity of the system to serve remaining load. Although capacity can be increased with the operation of the Granite City gas-fired generators, the generators are less reliable than transmission and less economical. Other contingencies will also limit the system's ability to serve customers.²⁶⁷

239. OES calculations of load growth with 1.5 percent conservation confirmed that St. Cloud's projected load will significantly exceed critical load by 2010 and thereafter without additional generation or transmission capacity.²⁶⁸

240. NAWO/ILSR and CETF agreed that the Applicants have demonstrated the need for the Monticello–St. Cloud segment of the Fargo Project because the projected load growth exceeds any reasonable estimate of current capacity and costs justify the expansion.²⁶⁹

241. Limiting the Fargo Project to this segment would not provide the necessary regional support to the southern Red River Valley or Alexandria and would not increase the NDEX or increase the potential for generation outlet.²⁷⁰

242. MCEA concluded that the Fargo Project would supply local areas and provide support for the Red River Valley.²⁷¹

MISO Review of the Fargo Project

243. MISO studied three general load serving areas along the path of the proposed Fargo Project: the Red River Valley Area, Alexandria Area, and the St. Cloud Area.²⁷²

244. In the Red River Valley, the winter peaking load was estimated to be 2,200 MW in 2011 and 2,367 MW in 2016. There is about 565 MW of generation within this area and the Jamestown-Maple River 345 kV line and 230 kV lines provide the balance of the power. If the 345 kV line and one of the 230 kV lines are out of service,

²⁶⁷ Ex. 1 at 4.30-4.35 (Application); Ex. 67 at 9-12 (Kline Direct); See also, Pub. T., Tab 4, William F. Banke, General Manager, Stearns Electric Assn., (Melrose) and Pub. Exh. 4.

²⁶⁸ Ex. 219 at 5.

²⁶⁹ Ex. 148 at 49 (Michaud Rebuttal); CETF Post-hearing Brief at 44-45.

²⁷⁰ See Ex. 74 at 1-2 (Kline Surrebuttal).

²⁷¹ Ex. 177 at 23 (Schedin Direct).

²⁷² Ex. 56 at 17 (Webb Direct).

the generation would not be sufficient to provide reliable service. By 2016, 545 MW (23 percent reduction in load) would be needed after a single transmission line outage. By providing a second 345 kV supply, the Fargo Project would assure that the system would remain secure for the loss of the single existing 345 kV supply, and would also address other reliability issues projected by 2016.²⁷³

245. Other alternatives were considered, including adding voltage support and a second 230 kV line from Boswell to Winger. This would address potential voltage collapse but with less margin and would not address projected need in Alexandria and St. Cloud. Adding a 345 kV extension or a new line from Dorsey to Maple River was also considered but would require the same or more miles of construction and would not serve Alexandria or St. Cloud.²⁷⁴

246. The Alexandria area is served by three 115 kV lines. By 2011, loss of any two of the lines would result in critically low voltage, and by winter peak of 2016, even a single contingency loss would reduce voltage to the point where it could not sustain any load. Although the probability of losing two lines is low, there is insufficient generation available to provide support. By 2016, 27 to 33 percent of the total load would have to be shed after the first line loss to withstand the loss of the next contingency and maintain adequate voltage.²⁷⁵ Alternatives, including an extension of 230 kV line, were considered. Although new 230 kV support would improve reliability through 2011, the Fargo Project would accommodate an additional 23 years of estimated load growth.²⁷⁶

247. In St. Cloud, MISO identified several possible contingency conditions by 2011.²⁷⁷

248. MISO concluded that the Fargo Project would provide long-term local reliability to the Red River Valley, Alexandria, and St. Cloud, and address future reliability needs in the Twin Cities and surrounding areas for many years.²⁷⁸

249. At the public hearings, the Sauk Center Public Utilities Commission,²⁷⁹ the City of Melrose,²⁸⁰ and Moorhead Public Service²⁸¹ also supported the CapX projects.

Projected Local Load Growth for the Brookings Project

250. Although the primary purpose of the Brookings Project is to increase outlet generation capacity, it will also improve local reliability. The Southwestern Minnesota

²⁷³ Ex. 56 at 18-19 (Webb Direct).

²⁷⁴ Ex. 56 at 20 (Webb Direct).

²⁷⁵ Ex. 56 at 21-22 (Webb).

²⁷⁶ Ex. 56 at 24 (Webb Direct).

²⁷⁷ Ex. 56 at 24 (Webb Direct).

²⁷⁸ Ex. 56 at 32 (Webb Direct).

²⁷⁹ Pub. T., Tab 4, Sunderman (Melrose), and Pub. Ex. 6.

²⁸⁰ Pub. T., Tab 4, Harren (Melrose), and Pub. Ex. 7. See *also*, Pub. Ex. 11, photos submitted in support, by Jim Nichols.

²⁸¹ Pub. Ex. 9.

Study was conducted after the Vision Study to determine the details of integrating the Brookings Project into the existing transmission system and to identify the initial benefits of the line, independent of the overall plan. The Southwestern Minnesota Study did not include a detailed examination of local load-serving, critical load levels or load projections, but local benefits were identified.²⁸²

251. Specifically, the proposed 345 kV/115 kV transformer at the Franklin Substation would strengthen the power supply for the New Ulm and Redwood Falls area and the Olivia and Bird Island area. The Lyon County to Hazel Creek 345 kV segment will strengthen service to Granite Falls and its surrounding area.²⁸³ In addition, the connection to the Lake Marion Substation would provide significant load-serving support in the growing areas of Scott and Dakota Counties.²⁸⁴ The planning engineers determined that this project would be a better alternative than increasing the number of north to south 115 kV lines through developed areas.²⁸⁵

252. Although the Applicants have demonstrated that the Brookings Project will generally strengthen service to local communities, there are no specific load forecasts upon which to determine the ability of current facilities to meet the need.²⁸⁶

253. MISO determined that the Brookings Project will support underlying lower voltage transmission systems along its route which will reduce loadings on the lower voltage circuits and provide better service quality to local transmission systems.²⁸⁷

254. In summary, the Applicants demonstrated that the CapX projects will improve the reliability of the transmission system to serve local load.²⁸⁸

Generation Outlet Capacity

255. The Applicants have stated that the CapX projects are needed in part to increase the generation outlet capacity for renewable resources and meet the RES. MISO, MCEA and OES projected strong demand for additional transmission to provide generation outlet, especially for wind generation. Although all parties supported implementation of the RES, some disagreed that the CapX projects are the best way to address this need. MCEA, NAWO/ILSR and CETF supported conditions on the certificates of need that would assure that new generation outlet capacity is dedicated to wind energy.

256. The La Crosse Project is expected to enhance the deliverability of wind generated power from southeastern Minnesota. There are approximately 12,000 MW of projects seeking to interconnect in southeastern Minnesota. The three RIGO lines are

²⁸² Ex. 1 at 4.36-4.40, Apx. A-4 at 2, 35 (Application).

²⁸³ Ex. 1 at 4.38-4.39, Apx. A-4 at 35 (Application); Ex. 104 at 7-8 (Alholinna Direct).

²⁸⁴ Ex. 1 at 4.39, Apx. 4 at 36; Ex. 104 at 8-10 (Alholinna Direct).

²⁸⁵ Ex. 1 at 4.39-4.40 (Application); Ex. 104 at 8 (Alholinna Direct) See *also*, Ex. 282 at 17-18 (Rakow Direct).

²⁸⁶ See Minn. R. pt. 7849.0120 A.

²⁸⁷ Ex. 56 at 36 (Webb Direct); T. 4 at 145 (Webb).

²⁸⁸ Ex. 257 at 19 (Ham Direct); Ex. 274 at 2 (Ham Surrebuttal); Ex. 56 at 9-10, 32, 36 (Webb Direct).

designed to help meet the RES 2012 milestone, providing approximately 700 to 900 MW of generation outlet capability in southeastern Minnesota. At those levels, much of the power would be absorbed in the Rochester area and the remainder would flow north on the Byron–Prairie Island 345 kV line to the Twin Cities. The net flow on the Byron–Prairie Island 345 kV line would still be north to south.²⁸⁹ Once the connected generation exceeds 900 MW, the level expected in the 2012-2015 timeframe, generation in excess of 900 MW could not be reliably delivered to the Twin Cities in the event the Prairie Island–North Rochester 345 kV segment were out of service. If the RIGO lines are approved, the La Crosse Project will allow capability beyond 900 MW, provide another path for the power, and assist utilities in meeting the 2016 milestones.²⁹⁰

257. The Fargo Project will cross a wind-rich area in northwestern Minnesota and eastern North Dakota. The transmission outlet capability from North Dakota is currently limited. The electrical boundary between Minnesota and North Dakota and South Dakota (NDEX) is identified by the Department of Energy as a congested area that limits wind generation development. The Fargo Project is expected to increase transfer across the NDEX limit by approximately 350 MW, which will support additional outlet for generators in northwest Minnesota and southeastern North Dakota.²⁹¹

258. The DRG Study showed that the existing transmission system provided virtually no opportunities for dispersed generation in the part of Minnesota traversed by the Fargo Project, and, more generally, showed the difficulty of adding dispersed generation sites to the high-voltage system.²⁹²

259. The Brookings Project is expected to provide approximately 700 MW of additional generation outlet capacity in the Buffalo Ridge area.²⁹³ It is a key component to the development of renewable energy resources.

260. CETF, NAWO/ILSR and NoCapX contended that the modeling of generation that was used in the studies is inconsistent with the asserted need of the Brookings Project to serve renewable generation. In the models, generation was injected from sites where coal projects are located. By planning the projects to run from areas near the coal plants, these parties are concerned that both the Fargo and Brookings Projects will serve coal generation rather than renewable energy. As Dr. Kildegaard explained it, “the presence or absence of conveniently located transmission affects the economic viability of current and future generation assets, not unlike the way in which a highway from a center city affects real estate values in the suburbs along the new route.”²⁹⁴ He pointed out that the cost of generation, including the cost for coal and for wind, is geographically specific.²⁹⁵ Thus, the proposed corridor for a new

²⁸⁹ Ex. 98 at 2-3 (King Rebuttal).

²⁹⁰ Ex. 98 at 1-3 (King Rebuttal).

²⁹¹ Ex. 1 at 6.49 (Application); Ex. 67 at 12 (Kline Direct); Ex. 70 at 7 (Kline Rebuttal).

²⁹² Ex. 100 at 49; T. 10 at 86-87 (Alholinna); Ex. 176 at 2-5 (Gramlich Surrebuttal).

²⁹³ Ex. 104 at 2, 5 (Alholinna Direct).

²⁹⁴ Ex. 166 at 5 (Kildegaard Direct).

²⁹⁵ *Id.*

transmission line must take into account the economics of the generation that it intends to serve.

261. The Applicants are aware of the changing regulatory environment and the increased requirements to provide electricity from renewable energy sources. The Applicants have not claimed that the transmission lines will serve only renewable energy, but both the Fargo and Brookings Projects will access wind-rich areas where wind development is well underway.²⁹⁶ Although the transmission lines could serve new coal generation, in the current regulatory environment, it is more likely that most of the new outlet capacity will serve wind generation.

262. Projects that seek interconnection must file a request with MISO and are placed on the MISO interconnection queue. In May 2008, MISO had approximately 60 generator interconnection requests along or near the counties where the Brookings Project will be routed: 15,940 MW of requests in the general area, including over 7,460 MW within the counties along the preliminary project route. MISO has performed studies to determine the effect the Brookings Project would have on the ability of generators to interconnect and reliably deliver output to the grid.²⁹⁷ Fifty-eight wind interconnection projects representing 4,358 MW of generation have been studied with the Brookings Project as part of the base case. For some of these projects, short-term interconnection solutions were identified. For others, the Brookings Project was an essential component of interconnection.²⁹⁸ Based on the studies, MISO witness Webb stated that it is “highly probable” that the 700 MW of increased transfer capacity in the Brookings Project would be used by wind capacity.²⁹⁹

263. OES, CETF³⁰⁰ and MCEA concurred that the Brookings Project is critical to increase wind generation outlet from the Buffalo Ridge and to support utilities’ compliance with the RES milestones. MCEA concluded that all three projects would create new generation outlet capacity.³⁰¹

264. In summary, the Applicants demonstrated that the CapX projects would improve the generation outlet capacity of the transmission system.

Benefits of the Upsized Alternative

265. Applicants concluded that the Upsized Alternative for each project would better serve longer term system expansion, provide additional flexibility, and make better use of transmission corridors. Since the proposed projects cross environmentally

²⁹⁶ T. 2B at 21-22 (Rogelstad); T. 5A at 64 (Webb).

²⁹⁷ Ex. 56 at 33-34 (Webb Direct).

²⁹⁸ Ex. 56 at 35 (Webb Direct).

²⁹⁹ T. 5A at 68 (Webb).

³⁰⁰ CETF Proposed Findings of Fact, etc. at #417, citing T. 3 at 216-218 (Lacey); Ex. 53 at 11-12 (Lacey Rebuttal).

³⁰¹ Ex. 177 at 5-7 (Schedin Direct); Ex. 176 at 4-5 (Gramlich Surrebuttal).

sensitive areas, building double-circuit structures now may avoid new river crossings in the future.³⁰²

266. The Applicants conceded that the La Crosse, Fargo and Brookings Projects as proposed are sufficient to meet forecasted load-serving needs. Most of the benefits associated with the larger structures included in the Upsized Alternative cannot be realized until other future transmission projects occur and are beyond the 2020 planning horizon.³⁰³

267. For the La Crosse Project, a second 345 kV circuit could provide access to economical power generated to the south or east. It could also increase delivery options during high wind, low load periods and increase import capability in times of high load and no wind.³⁰⁴ Although it was suggested that a second circuit could increase the level of the Wisconsin-Minnesota Export, there was no evidence of the current or anticipated export level. There is no evidence of current constraints or planning in progress to suggest that the need for a second circuit is imminent.

268. For the Fargo Project, there is strong evidence that transmission is currently constrained and that an upgrade beyond 345 kV is needed to increase the NDEX.³⁰⁵

269. For the western segments of the Brookings Project, the high number of proposed wind projects in western Minnesota and northeast South Dakota on the MISO queue, and the potentially high transfer demand from the west, are likely to increase the need for future upgrades.³⁰⁶ For the eastern segments of the Brookings Project, a second 345 kV circuit could provide the beginning of an outside-ring 345 kV loop for the Twin Cities load, decrease system loss and transfer line flow more efficiently. Although adding the second circuit from Helena to Hampton Corner is not part of the Applicant's proposal at this time,³⁰⁷ the Upsized Alternative will provide infrastructure that could reduce the number of new rights-of-way required in the future.³⁰⁸

270. OES, MISO and MCEA favored the potential benefits that the Upsized Alternative offers. OES concluded that the Upsized Alternative was a reasonable and prudent alternative to the three projects as proposed.³⁰⁹ MISO witness Webb stated that its "standard practice" in other parts of the Midwest to build transmission that is

³⁰² Ex. 121 at 32-34 (Grivna Rebuttal).

³⁰³ Ex. 121 at 9 (Grivna Rebuttal).

³⁰⁴ Ex. 121 at 40-41 (Grivna Rebuttal).

³⁰⁵ Ex. 70 at 10 (Kline Rebuttal).

³⁰⁶ Ex. 121 at 37-38 (Grivna Rebuttal).

³⁰⁷ Ex. 104 at 17 (Alholinna Direct) ("Planning engineers determined that [the Brookings to Lyon County] segment did not need to be double circuit 345 kV because a second circuit would not improve system performance or increase generation outlet....(T)he transfer capability of the transmission system is limited not by the capacity of this segment or the line impedance, but rather is limited by the adjacent and underlying transmission systems.")

³⁰⁸ Ex. 121 at 39 (Grivna Rebuttal).

³⁰⁹ OES Posthearing Brief at 10, citing Ex. 307 at 8, 9, 21 (Rakow Surrebuttal).

double-circuit compatible.³¹⁰ MCEA concluded that the investment is prudent only if increased capacity is committed to renewable energy. Each of them concluded that the Upsized Alternative was the best alternative and would provide a cost-effective foundation for a growing transmission system while at the same time minimizing the amount of additional right-of-way that may be required as the system grows.

A (2). Effects of the Applicants' Existing or Expected Conservation Programs and State and Federal Conservation Programs.

271. This rule criterion is interpreted in light of the language of Minn. Stat. §216B.243, subd. 3, which states: "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."

Public Support for Conservation, Demand Management, and Renewable Energy

272. NAWO/ILSR and CETF contended that targeted conservation and load management could reduce the community reliability need for the CapX projects.³¹¹ Several members of the public also advocated that the utility companies should more aggressively pursue conservation, demand management, and renewable energy instead of transmission lines.³¹² Glenn Bennett of Lowry, who has served as a director of Runestone Electric, an electric distribution cooperative, testified that additional conservation, such as motion detector switches and time-of-day monitoring, should be implemented before additional transmission lines are constructed.³¹³ Irv Balto of Chaseburg also advocated for increased conservation and peak demand management.³¹⁴ Virgil Fuchs has a wind turbine on his property that supplies his needs, and he has power to sell to Runestone Electric. He favors greater reliance on local renewable energy.³¹⁵

273. Some participants encouraged greater focus on the strong wind resources in Minnesota and its potential benefits to the state as an alternative.³¹⁶ Other individuals asserted that the CapX projects were not large enough to harness the state's wind energy.³¹⁷

274. Members of the public also preferred that a combination of conservation, demand management and small generation located closer to load be pursued rather

³¹⁰ T. 5B at 52-53 (Webb).

³¹¹ NAWO/ILSR Posthearing Brief at 21; CETF Posthearing Brief at 31.

³¹² See, e.g., Publ. T., Tab 18, Erickson (Rochester); Tab 15, Beckman, Leck, Soule (Cannon Falls); Tab 13, Diffley, Kaufenberg, Mealman (Lakeville); Tab 11, Minar (New Prague); Pub. Comm. Timmerman, filed 8/08/08, #5464476; Pohl, filed 8/21/08, #5464478; Quinlivan, filed 7/31/08, #5405095; Iremonger, filed 10/06/08 # 5551881; see also, Pub. Ex. 20.

³¹³ Pub. T., Tab 3, Bennett (Alexandria).

³¹⁴ Pub. Comm. Balto, filed 8/8/08, #5417357.

³¹⁵ Pub. T., Tab 4, Fuchs (Melrose).

³¹⁶ Pub. T. Tab 1, Wernsing (Moorhead); Tab 14, Tyler (Cannon Falls).

³¹⁷ Pub. T. Tab 5, Bruer (Clearwater); Tab 8, Fenske (Marshall).

than high voltage transmission lines.³¹⁸ Linda Halley of Eureka Township requested that the Commission deny the certificates of need and require alternatives that relied more heavily on conservation and C-BED wind projects.³¹⁹ Julie Anderson, Denise Radcliffe, Caroline van Schaik, Stephen Quinlivan, Mackenzie Sigler and others shared this view, and believe that transmission lines are representative of antiquated ideas about energy use and planning.³²⁰ Some anticipate that new technologies will slow the growth of electricity.³²¹

275. There were specific objections raised by Margaret Levin on behalf of the Sierra Club North Star Chapter, and others, that the Applicants had not demonstrated that the La Crosse Project was needed to provide reliable service to Rochester and La Crosse.³²² Some were concerned that the La Crosse Project would encourage transport of coal generation from the Dakotas to points east of Minnesota.³²³

276. With few exceptions, compliance with the conservation statute would result in energy savings significantly higher than the levels electric utilities have achieved in the past. This is reflected in the OES analysis. The conservation statute sets an aggressive but achievable goal.³²⁴ Although it may be possible to achieve higher levels of conservation, there are no solid estimates upon which to base a lower forecast.³²⁵ Also, in evaluating conservation savings greater than 1.5 percent, the additional costs to attain the higher level must be considered.³²⁶

277. The Applicants' consideration of conservation and load management is reflected in their estimates of future load growth and is validated by the OES analysis. Mr. Davis calculated the impact of the conservation statute on demand as a whole and on five local load areas included in the Application and concluded that forecasted load would exceed the critical load level by 2011 in four of the areas, Rochester, La Crosse, Red River Valley and St. Cloud, taking into account the 1.5 percent energy savings goal. With the 1.5 percent energy savings goal, the Alexandria load forecast would exceed the critical load level between 2015 and 2017.³²⁷

278. Even if load growth is smaller than forecasted, the Renewable Energy Standard will bring new generation into the system that would require additional

³¹⁸ See e.g., Pub. Comm. Pfenning, filed 10/06/08, #5551876; Wambeke, Christenson, filed 9/23/08, #5551877; Francois, Hunt, filed 9/22/08, #5518689; Falc, Bovee, filed 9/22/08, #5518690.

³¹⁹ Pub. T., Tab 15, Halley (Cannon Falls); Pub. Ex. 29.

³²⁰ Pub. Comm., Radcliffe, filed 8/25/08, #5464474; van Schaik, Bot, Lundberg, filed 10/06/08, #5551881; Quinlivan, filed 7/31/08, # 5405095; Sigler, filed 9/24/08, #5520590.

³²¹ See e.g., Pub. Comm., Wilson, filed 7/31/08, #5405084.

³²² Pub. Comm., Levin, filed 10/07/08, #5554862; Pub. T., Tab 17, Eide-Tollefson (Winona).

³²³ See e.g., Pub. T., Tab 18, Erickson (Rochester).

³²⁴ Ex. 215 at 2 (Davis Direct).

³²⁵ Ex. 215 at 3 (Davis Direct).

³²⁶ T. 21 at 89-90 (Davis).

³²⁷ Ex. 215 at 15-16 (Davis Direct).

transmission.³²⁸ Compare the 3,160 to 4,927 MW needed for RES to the 1,370 MW of estimated conservation at 1.5 percent.³²⁹

279. No party calculated conservation estimates that yielded forecasts lower than the identified critical load levels.

280. Overall, although achieving the energy conservation goals will reduce load levels, the offset is not sufficient to meet projected regional load growth, the community needs identified by the Applicants, or to increase generation outlet.³³⁰

281. There is no evidence that CapX projects will impede the development of distributed generation. Xcel Energy currently has plans to buy 500 MW of C-BED and has PPAs for 200 MW or more. Adding C-BED projects will not reduce the need for transmission to import energy when wind power is not available.³³¹

282. The public's interest in conservation, demand management, and renewable energy is reflected in the legislatively enacted conservation and renewable energy standards, the impetus for C-BED, and the DRG and RES studies. The CapX projects are consistent with the current laws. There is no basis to hold the Applicants to higher, undefined standards in this proceeding.

A (3). Effects of the Applicants' Promotional Practices.

283. There was no evidence that the Applicants engaged in promotional practices that have increased the use of or demand for electricity. The Applicants have publicized the need for additional transmission capacity in Minnesota to maintain and improve the system.³³²

284. OES has reviewed the promotional practices of the Applicants in several cases since 2006 and concluded that this criterion had been met.³³³

A (4). Ability of Facilities that Do Not Require Certificates of Need to Meet the Future Demand.

285. Alternatives not requiring a certificate of need could be either generation facilities or transmission facilities.³³⁴ The Applicants analyzed transmission and generation alternatives that do not require a certificate of need. In general, upgrading existing facilities and reconductoring alone could not meet the projected increase in load to 2020. For the Fargo project, some improvements decreased voltage to unacceptable

³²⁸ T. 1A at 92-93 (Rogelstad).

³²⁹ Ex. 247 at 4 (Peirce Surrebuttal), Ex. 215 at 12 (Davis Direct).

³³⁰ See, Ex. 215 at 17 (Davis Direct).

³³¹ Ex. 1 at 7.18-7.20 (Application); Ex. 9 at 5 (Rogelstad Rebuttal).

³³² Ex. 1 at 1.20-1.21 (Application).

³³³ Ex. 282 at 84-85 (Rakow Direct).

³³⁴ See Minn. Stat. §§ 216B.169, 216B.2421, subd. 2.

levels. For the Brookings Project, additional rebuilding and reconductoring could not significantly increase generation outlet.³³⁵

286. OES concurred that the scope of the needs addressed by the CapX project, including community service reliability, regional reliability, and creation of additional generation outlet, could not be met by non-certificate-of-need alternatives.³³⁶

287. NoCapX and CETF contended that the Applicants did not properly consider existing local generation in the analysis of community need. However, both the Applicants and MISO evaluated the ability of local generation to serve load and the reliability of the system when the generators were not available.³³⁷

288. The No Build Alternative would provide none of the benefits associated with the CapX projects.³³⁸ None of the parties offered an alternative that could improve regional reliability, meet the identified community needs, or improve renewable generation outlet capacity.

A (5). The Effect of the Proposed Facility, or a Suitable Modification, to Use Resources Efficiently.

289. The CapX projects will use resources efficiently.

290. The Applicants have shown that the probable result of denial of the certificates of need would be an adverse effect upon the future adequacy, reliability, or efficiency of energy supply to the applicants, to the applicants' customers, or to the people of Minnesota and neighboring states. They have demonstrated that load growth will rise to 24,701 MW or more by 2020, that the capacity to serve five local areas will be exceeded prior to 2020, and that there is a need to support additional generation outlet.

291. Rule 7849.0120 B: requires that a certificate of need be granted to the applicant if:

B. A More Reasonable and Prudent Alternative to the Proposed Facility Has Not Been Demonstrated by a Preponderance of the Evidence on the Record, Considering:

B (1). The Appropriateness of the Size, Type and Timing of the Proposed Facility, Relative to Reasonable Alternatives.

³³⁵ Ex. 1 at 7.24-7.25 (Application); Ex. 9 at 3-5 (Rogelstad Rebuttal).

³³⁶ Ex. 282 at 28-30 (Rakow Direct); OES Reply Brief at 35-36.

³³⁷ Rochester: Ex. 94 at 6-7 (King Direct); Ex. 56 at 27 (Webb Direct); La Crosse: Ex. 94 at 9-11 (King Direct); Ex. 56 at 29-31 (Webb Direct); So. Red River Valley: Ex. 67 at 6 (Kline Direct); Ex. 56 at 18 (Webb Direct); Alexandria: Ex. 67 at 8 (Kline Direct); Ex. 56 at 23 (Webb Direct); St. Cloud: Ex. 67 at 11 (Kline Direct); Ex. 56 at 25-26 (Webb Direct).

³³⁸ Ex. 1 at 7.36-7.40 (Application); Ex. 67 at 18-19 (Kline Direct).

292. The “size” of the project refers to the quantity of power transfers that the transmission infrastructure improvement enables. The CapX projects are designed to address the level of need identified in A (1): to support system-wide load growth, meet projected load growth in specified local areas, and increase generation outlet. Two alternatives were sufficiently developed to address the demonstrated level of need: the CapX projects as proposed, and the Upsized Alternative.

293. Applicants have demonstrated that the CapX projects are needed to meet its identified needs.

294. Applicants also provided the information necessary to consider whether the Upsized Alternative is a more reasonable and prudent alternative.³³⁹

295. Other parties must show that there is a more reasonable and prudent alternative to the Applicants’ proposal.

296. Although there is evidence that some of the local needs identified in the Application may be met with generation and lower voltage transmission, no specific alternative was proposed to meet those needs, nor was an alternative offered that would address regional reliability and supply the same level of generation outlet. In some instances, the parties who contested the need for the proposed projects relied upon generation or transmission facilities that would require certificates of need that have not yet been approved or for which no applications have been filed.

297. OES closely evaluated the costs of the three projects, including the cost of energy losses³⁴⁰ and termination points,³⁴¹ to determine if there was a more reasonable and prudent alternative to the CapX projects.

298. OES concluded that Applicants’ proposed size for the La Crosse Project and the Fargo Project was reasonable to meet community service reliability.³⁴² Although the Applicants were not able to quantify the size of the community service reliability needs served by the Brookings Project, OES concurred that the Brookings Project would have some avoided cost benefits.³⁴³

299. OES initially took the position that the CapX projects may be too small to meet the forecasted load growth and provide sufficient outlet for high quality renewable resources.³⁴⁴ Since both the Fargo Project and Brookings Project provide access to high quality renewable resources, OES asserted that higher voltage alternative should be considered. Because the study, design, permitting and construction of transmission lines extend over many years, a proposed project should take into account needs into

³³⁹ See Minn. R. 7849.0110.

³⁴⁰ Ex. 282 at 40-55 (Rakow Direct).

³⁴¹ Ex. 282 at 57-68 (Rakow Direct).

³⁴² Ex. 282 at 16, 17 (Rakow Direct).

³⁴³ Ex. 282 at 18-20 (Rakow Direct).

³⁴⁴ Ex. 282 at 18,32-33 (Rakow Direct).

the foreseeable future.³⁴⁵ OES also questioned whether the Applicants had understated the total costs of a higher voltage line, including line losses, and posited that higher voltage may be more cost-effective.³⁴⁶

300. Electrical line losses are one measure of efficiency. If there is significant line loss, additional electricity must be generated, and the higher the loss, the greater the cost of extra generation. Line losses are a significant factor in evaluating the overall cost of each option.³⁴⁷

301. Based on information provided by the Applicants on the cost of constructing the Twin Cities to Fargo line at 500 kV (Fargo 500kV Alternative), and calculation of line losses, OES concluded that under three out of four potential scenarios a Fargo 500 kV Alternative would be the least cost choice. Under only one scenario, no increased use of the proposed line above the level assumed by Applicants, would the Applicants' proposed Fargo Project be the least cost choice, with significant energy savings.³⁴⁸

302. MCEA witness Schedin also questioned whether the Fargo Project was too small as proposed to serve the Project's stated need. Mr. Schedin recommended that the Applicants consider a 345 kV double-circuit alternative.³⁴⁹

Development of the Upsized Alternative

303. In response to the direct testimony of OES and MCEA, the Applicants re-examined all of the projects to determine whether they should be upsized and compared the optimal electrical performance, the costs and other characteristics associated with the identified options. Applicants analyzed six alternatives, including the single-circuit 500 kV option proposed by Dr. Rakow and the double circuit 345 kV option proposed by Mr. Schedin:

- a. 345 kV single-circuit with larger conductors;
- b. 345 kV double-circuit with both circuits deployed immediate;
- c. 345 single-circuit installed, double circuit capable;
- d. 500 kV single-circuit;
- e. 500 kV double-circuit; and
- f. 345 kV and 500 kV double-circuit using common structures.³⁵⁰

³⁴⁵ Ex. 282 at 33-37 (Rakow Direct). For this project, the studies began before 2005 and the in-service date of the projects extends to 2015. See, Ex. 282 at 37 (Rakow Direct).

³⁴⁶ Ex. 282 at 33, 74-75 (Rakow Direct).

³⁴⁷ Ex. 282 at 43-53 (Rakow Direct)

³⁴⁸ Ex. 282 at 74, 75-77 (Rakow Direct).

³⁴⁹ Ex. 177 at 23 (Schedin Direct).

304. In their review, Applicants applied a number of factors, including an estimate of future growth, ability to serve load and provide bulk power, flexibility, cost including losses, thermal limits, physical characteristics and so forth. Although the Applicants did not conduct new engineering studies, the upsized models were analyzed and checked against obvious benefits and detriments.³⁵¹

305. The Applicants analyzed the single-circuit 500 kV option, including Dr. Rakow's analysis of line loss. Dr. Rakow's analysis is premised on an increase of transfer across the NDEX for the proposed Fargo line that would require other upgrades to the underlying transmission system. Those upgrades have not been studied or built into the model. Adding additional capacity would be limited by the ability of the underlying system to withstand the new line's outage. Because the increase in transfer capability would require installation of another high voltage line, the benefits may not be achieved for several years.

306. The 500 kV line has fewer load serving benefits and provides less ability for interconnection. Since a fully-utilized double-circuit 345 kV line provides similar capability as a 500 kV line, the Applicants preferred the configuration that would best address multiple issues.³⁵² A double-circuit 345 kV line will also require less right-of-way than a single-circuit 500 kV line would require.³⁵³

307. Although a double-circuit 345 kV line may have higher line losses than 500 kV facilities, the cost of the line losses is outweighed by the difficulties of integrating 500 kV facilities into the underlying system. Applicants agreed with Mr. Schedin that a double-circuit 345 kV option was preferable.³⁵⁴

308. The Applicants concluded that the three projects as proposed were adequate to meet the load-serving and immediate generation outlet needs outlined in the Application, but that taking the longer view, a double-circuit 345 kV configuration, the Upsized Alternative, would provide a better solution. Because the benefits of the second circuit cannot be realized until other transmission projects occur, the Applicants do not recommend adding the second circuit at this time. Instead, Applicants propose constructing towers that will allow the second circuit to be strung when needed.³⁵⁵

309. Applicants also prefer the double-circuit 345 kV option over the 500 kV option because Minnesota utilities have more experience with 345 kV, and no experience using 500 kV for load-serving purposes.³⁵⁶

310. OES evaluated three alternatives to upsize the proposed Fargo Project:

³⁵⁰ Ex. 121 at 15, 32-34 (Grivna Rebuttal).

³⁵¹ Ex. 121 at 14-15 (Grivna Rebuttal).

³⁵² Ex. 121 at 19-25 (Grivna Rebuttal).

³⁵³ Ex. 121 at 26 (Grivna Rebuttal).

³⁵⁴ Ex. 121 at 27-30, 32 (Grivna Rebuttal).

³⁵⁵ Ex. 121 at 9-10 (Grivna Rebuttal); Attachments A-D.

³⁵⁶ Ex. 121 at 34 (Grivna Rebuttal).

- a. 345 kV double-circuit capable, single-circuit installed (Upsized Alternative);
- b. 345 kV double-circuit; and
- c. 500 kV single-circuit.

311. Dr. Rakow concluded that either the 345 kV double-circuit or the 500 kV single circuit was economically superior to the Applicants' proposed project or the Upsized Alternative because of their energy conservation benefits.³⁵⁷ He reviewed the Applicants' engineering analysis of the alternatives, including Applicants' witness Grivna's evaluation of the 500 kV alternative. Most of Mr. Grivna's concerns, although shared in part by Mr. Schedin and Mr. Webb, were not significant to Dr. Rakow.³⁵⁸

312. Dr. Rakow agreed that the Applicants' concern about the stability of adding a 500 kV alternative was significant.³⁵⁹ Moving to 500 kV and the higher transfer levels could result in unanticipated impacts on regional stability that would have to be mitigated to obtain maximum transfer capability.³⁶⁰

313. In comparison, by installing a single-circuit 345 kV line initially and conducting additional studies, one could be certain that adding a second circuit would not decrease the system's stability and would maximize the line's potential.³⁶¹

314. Due to the lack of stability analysis, Dr. Rakow concluded that no option was superior to the Applicants' Upsized Alternative.³⁶² Mr. Schedin concurred that there was no more reasonable and prudent alternative.³⁶³

315. The Applicants acknowledge that additional certificates of need will be required before the second circuits are added. New studies must be conducted to determine the underlying upgrades that would be required with the addition of the second circuit. The capacity and thermal ratings of the second circuits will be evaluated at that time.³⁶⁴

316. CETF claimed that "the performance of the upsizing option has not been verified with load flow study or by other means." However, the Upsized Alternative does not change the conductors, transformers, voltages, number of circuits strung, or other parameters used in the original engineering analysis. Rather, the proposal is to build larger towers to allow stringing a second circuit at a later date. Construction of the

³⁵⁷ Ex. 307 at 16 (Rakow Surrebuttal).

³⁵⁸ Ex. 307 at 16-19 (Rakow Surrebuttal).

³⁵⁹ Ex. 307 at 19 (Rakow Surrebuttal).

³⁶⁰ Ex. 121 at 24 (Grivna Rebuttal)

³⁶¹ Ex. 121 at 24 (Grivna Rebuttal).

³⁶² Ex. 307 at 20, 21 (Rakow Surrebuttal); Ex. 308 at 5 (Rakow Statement).

³⁶³ Ex. 199 at 5 (Schedin Surrebuttal).

³⁶⁴ Ex. 121 at 35 (Grivna Rebuttal); see *a/so* NoCapX Posthearing Brief at 1.

second circuit would require a certificate of need and the appropriate engineering studies.³⁶⁵

317. The additional cost of the Upsized Alternative is about \$200 million, significantly more expensive than the three proposed projects. The extra costs are attributed to building larger, stronger structures to which a second circuit can be added at a later date. The higher costs will be built into the rates paid for transmission service. The Applicants acknowledge that stringing the second circuit for any of the projects will require another certificate of need, and they have made no showing that the need is present. Thus, the decision whether to incur approximately \$200 million must be based on whether it is prudent to invest now because additional lines may be needed at some time in the future and the configuration of these projects will serve that need.

318. The Applicants, OES, MISO and MCEA believe that the Upsized Alternative presents a cost-effective opportunity to serve future needs and to minimize the difficulty of siting and constructing future large transmission lines. In some parts of the country it is standard practice to install large structures to facilitate later double-circuiting.³⁶⁶

319. There are no specific load-growth forecasts to support the Upsized Alternative for either regional reliability or to improve community service.

320. For the Fargo Project, the estimated incremental cost of the Upsized Alternative is \$80 to \$110 million.³⁶⁷ Dr. Rakow and Mr. Schedin demonstrated that the area west of the Fargo Project is rich with resources and currently constrained. An increase of transfer capability to the 1200 MW level that was used to study a higher voltage option will require a certificate of need to upgrade the Minnesota Valley–Blue Lake 230 kV line to 345 kV double-circuit, at an estimated cost of \$410 million, and additional costs of approximately \$125 to \$250 million to upgrade underlying facilities.³⁶⁸

321. The Minnesota Valley-Blue Lake 230 kV line presents a significant constraint on further expansion of both the Fargo Project and the Brookings Project. Studies are underway to upgrade the line to 345 kV single or double circuit. Applicants anticipated that an application for a certificate of need would be filed in 2009.³⁶⁹

322. For the Brookings Project, the incremental cost of the Upsized Alternative is \$51 to \$55 million.³⁷⁰ The large number of interconnection requests on the MISO queue, and the high quality of wind resources in western Minnesota and eastern South Dakota are strong evidence that a second circuit will be needed. The total number of forecasted megawatts needed to meet RES also supports this probability. Also, the Brookings Project as proposed included some double-circuit segments. Adding larger

³⁶⁵ Ex. 121 at 10 (Grivna Rebuttal); OES Reply Brief at 52.

³⁶⁶ T. 5B at 52-53 (Webb).

³⁶⁷ Ex. 88 at 4 (Stevenson Rebuttal); Attachment F.

³⁶⁸ Ex. 88 at 6 (Stevenson Rebuttal).

³⁶⁹ Ex. 70 at 10 (Kline Rebuttal); Ex. 104 at 13-14 (Alholinna Direct).

³⁷⁰ Ex. 120 at 4-5 (Lennon Rebuttal); Attachment F.

structures to allow expansion for a second circuit may help address transmission development that is already under consideration. The Helena-Lake Marion-Hampton Corner segment could become a part of a possible second 345 kV loop around the outside of the current metropolitan area.³⁷¹ It is anticipated that the addition of the Minnesota Valley-Blue Lake upgrade to 345 kV could increase the generation outlet capacity of the Brookings Project from 1900 MW to 3000 MW.³⁷²

323. For the La Crosse Project, the costs of the Upsized Alternative will depend on the choice of river crossing. For the Alma Crossing, the incremental costs are approximately \$25 to \$41 million. For the Southern Crossing, the incremental costs are approximately \$52 to \$69 million.³⁷³

324. As proposed, without upsizing, the La Crosse Project will meet the projected need for several decades. With upsizing, a second 345 kV circuit could provide Minnesota with access to potentially more economical power generated to the south or east. It could also increase delivery options during high wind, low load periods, and increase import capability load is high and the wind is not blowing. If states to the east add or expand renewable energy requirements, a second circuit could increase the potential to deliver some of the high quality wind resources from the west to the east.³⁷⁴ Only these general statements support the Upsized Alternative. There are no specific proposals or contingencies that were identified that would suggest that the Upsized Alternative is a more reasonable and prudent alternative to the La Crosse Project as proposed.

325. The La Crosse Project as proposed with the RIGO lines will substantially increase generation outlet for renewable energy.

326. Although it is difficult to quantify the benefit, the Upsized Alternative may prevent the disruption of environmentally sensitive areas for an additional Mississippi River crossing. Since the need for a second circuit may be decades away, it is difficult to predict what other changes may occur or technologies may be in place that would eliminate the need for such a crossing at that time.

327. There is no evidence in the record to determine whether it would be a reasonable and prudent alternative to limit the Upsized Alternative to installation of the larger, double-circuit compatible structures only in the environmentally sensitive areas on the two sides of the Mississippi River crossings.

328. In summary, the Applicants have demonstrated that the Upsized Alternative is a more reasonable and prudent alternative for the Fargo Project and the Brookings Project to address current constraints on the system and significantly increase generation outlet capacity. Applicants have failed to demonstrate that the

³⁷¹ Ex. 121 at 36-39 (Grivna Rebuttal).

³⁷² Ex. 104 at 14 (Alholinna Direct).

³⁷³ Ex. 89 at 4 (Stevenson Rebuttal); Attachment F.

³⁷⁴ Ex. 121 at 40-41 (Grivna Rebuttal).

Upsized Alternative is a more reasonable and prudent alternative to the La Crosse Project as proposed.

Selection of Conductor

329. NoCapX challenged the MVA capacity of the capacitors selected by the Applicants, claiming that only a small portion of the rated capacity would be used.³⁷⁵ NoCapX's representative may be confused about the increased outlet capacity provided by the transmission line and the thermal capacity of that line. However, as pointed out by Mr. Alholinna, the MVA capacity is selected to support the operation of the transmission system as a whole.³⁷⁶

330. In selecting the appropriate cable, the Applicants balanced the costs to acquire the cable versus the benefits resulting from the cable's performance. The bundled conductor 954 ACSS cable was selected for its characteristics of lower losses with slightly higher cost at higher loadings. OES concluded that the sizes of the proposed conductor were reasonable, and no alternative was offered.³⁷⁷

Installation of Direct Current (DC) Lines

331. The Applicants considered the alternative of installing direct current (DC) lines, and related substations. However, the alternative was rejected because of the high estimated cost: \$9.7 billion for the DC configuration, compared to approximately \$1.5 million for the CapX projects as proposed.³⁷⁸ OES reviewed this analysis and concurred that the DC option was not viable.³⁷⁹ No other party offered expert testimony addressing Applicants' proposed AC line.

NAWO/ILSR Has Failed to Provide an Alternative to the CapX Projects

332. NAWO/ILSR asserted that each element of need can be met with a more reasonable and prudent alternative with far less harm to the natural and socioeconomic environments and with the same level of reliability. CETF endorsed NAWO/ILSR's position.³⁸⁰ However, they have failed to produce sufficient information to evaluate any alternative to the Applicants' proposals.

333. NAWO/ILSR relied in part on conservation measures such as Smart Grid and demand management, but, as addressed above, NAWO/ILSR failed to produce substantiated forecasts to support its claims. There is no evidence that conservation and demand management can meet the projected load growth for the region or for the identified communities.

³⁷⁵ NoCapX Brief at 2, 10-11.

³⁷⁶ T. 10 at 117-119 (Question from Overland; Alholinna Response).

³⁷⁷ Ex. 282 at 21-22 (Rakow Direct).

³⁷⁸ Ex. 1 at 7.25-7.26 (Application).

³⁷⁹ Ex. 282 at 23 (Rakow Direct).

³⁸⁰ NAWO/ILSR Posthearing Brief at 26-27; CETF Posthearing Brief at 4-5.

334. Also, NAWO/ILSR contended that the Applicants failed to demonstrate that the Brookings Project was the least cost option or necessary to comply with the RES. However, it failed to offer an alternative that could add the equivalent of 700 MW of renewable energy to the transmission system or the costs and upgrades for such an alternative.

335. NAWO/ILSR favored dispersed generation technologies over large, remote central-station power plants, connected to load centers with relatively few high voltage lines, because dispersed generation is “cost-competitive and often cheaper and faster to implement than central station based strategies.”³⁸¹ It asserted that large central-station power plants will not be built in the future and that dispersed, small generation, closer to load is the new paradigm and a more cost-effective alternative.

336. Many members of the public also supported increased C-BED, both because of its benefits to local communities and because they perceived that C-BED could serve local load and minimize the need for new transmission. Some were concerned that the CapX projects’ large size would inhibit C-BED.³⁸²

337. No party, including NAWO/ILSR, came forward with a specific proposal to site small generation facilities, with approximate locations, the associated costs, engineering studies and transmission upgrades, as an alternative to the CapX project as a whole, or for the La Crosse, Fargo, or Brookings Projects individually. Instead, NAWO/ILSR relied on the results of the DRG Study³⁸³ to support its claim. No party has shown that the DRG Study results offer a viable alternative to the CapX projects.

338. Phase I of the DRG Study was conducted to determine if 600 MW of dispersed renewable generation of 10 to 40 MW each could be sited with minimal impact on the regional transmission system. The DRG Study was conducted at the direction of the Legislature as part of the Next Generation Energy Act of 2007. A Technical Review Committee (TRC) oversaw each step of the study and reviewed its progress and results. A smaller study team conducted the analysis under the direction of the TRC. The study team developed a state-wide model of the electrical system that included lower voltage lines and developed a methodology for identifying potential opportunities for dispersed renewable generation. The study results demonstrated that 600 MW could be sited without significantly affecting any transmission infrastructure, but that even dispersed generation could have a substantial impact on the transmission grid overall.³⁸⁴

³⁸¹ NAWO/ILSR Brief at 1-2.

³⁸² Pub. T., Tab 3, Fuchs (Melrose); Tab 7, Dacey (Marshall); Tab 11, Magnussen (New Prague); Tab 12, Budenski (Lakeville); Tab 13, Olstad, Diffley (Lakeville); Tab 14, Tyler (Cannon Fall); Tab 15, Beckman, Longfellow, Topp (Cannon Falls); Pub. Comm., Grecco, Kawahara, Ouray filed 7/31/08, #5405095; Peter Dwyer, Avon Hills Initiative, filed 7/08/08, #5322765.

³⁸³ Ex. 110, “Dispersed Renewable Generation Transmission Study,” Volumes 1-3, prepared by Minnesota Transmission Owners, June 16, 2008, Docket No. E999/DI-08-649.

³⁸⁴ Ex. 110 at 3.

339. After applying several screening criteria, 300 potential DRG locations were selected and then narrowed to 42 geographically diverse sites for closer examination. As part its analysis, the study team attempted to distribute the DRG across the five out-state planning zones. The study team was not able to locate any potential connection zones in the Northwest Planning Zone, and for 19 of the 42 sites, there were transmission limitations below 40 MW.

340. The conclusions were limited in that the ability of any one project to actually connect at the identified site would require detailed assessment and coordination with MISO. Pending interconnection requests may occupy potential interconnection sites.³⁸⁵

341. The DRG Study showed that even small amounts of DRG added to the lower voltage system in the Northwest, Northeast, and West Central planning zones could overload the system and impact the high voltage system for three hundred miles or more.³⁸⁶ The constraints limited all types of renewable generation, both dispersed and larger scale.³⁸⁷

342. The Fargo Project and Brookings Project will pass through the areas where the DRG Study identified the fewest opportunities for siting.³⁸⁸

343. One of the parameters of the DRG Study was that it looked at interconnection opportunities in 2010, before any of the CapX projects would come on line.³⁸⁹ It is also significant that the DRG Study was a “gen-to-gen” study. That is, to evaluate whether DRG could be added, 600 MW of other generation was taken off line. The DRG Study did not attempt to determine if that 600 MW could be added back into the system. A MISO interconnection study would take into account existing generation.³⁹⁰

344. There was no evidence that the DRG locations identified in the study could improve the regional reliability of the transmission system or meet the community needs identified in the Application, even if each one were successfully sited.³⁹¹ Since the projected quantity of generation to meet the RES is between 3,160 MW and 4,927 MW,³⁹² there is no basis to conclude that approval of CapX will impede siting 600 MW of DRG.

345. Mr. Schedin, also a member of the TRC, gave several specific reasons why the DRG Study did not demonstrate that dispersed generation was a substitute in

³⁸⁵ Ex. 110 at 13-14.

³⁸⁶ Ex. 109 at 5 (Alholinna Surrebuttal). Mr. Alholinna was the Study’s Team Lead and member of the TRC.

³⁸⁷ Ex. 176 at 2-3 (Gramlich Surrebuttal).

³⁸⁸ *Compare*, Ex. 110 at 49 (Final DRG Site Map), *with* Ex. 1 at 2.5, Fig. 2-2, and 2.6-2.8, Fig. 2-3 (Application).

³⁸⁹ T. 9 at 183 (Alholinna).

³⁹⁰ T. 10 at 88-91 (Alholinna).

³⁹¹ T. 11 at 70, 75 (Alholinna).

³⁹² Ex. 275 at 1 (Ham Surrebuttal); Ex. 247 at 4 (Peirce Surrebuttal).

whole or in part for the CapX projects. The DRG Study examined a snapshot of transmission in 2010 while the CapX projects address needs identified in 2014 and beyond; the Study showed that new dispersed generation in the West-Central planning zone required major transmission additions; the Study did not take into account projects already in the MISO queue that may be built before 2010; the Study expressly stated that actual siting of the identified dispersed generation projects would require additional study; and transformers supplying the Dorsey-Forbes 500 kV line create a bottleneck to good wind sites with the possible exception of southeastern Minnesota.³⁹³

346. Based on his participation in the DRG Study, Mr. Schedin's opinion was that any dispersed generation would have some impact on the transmission system unless equivalent generation at the same site was shut down. Restricting wind development to areas with the least transmission impact may not take advantage of superior wind sources.³⁹⁴

347. It is a fundamental policy of Minnesota energy planning to use existing transmission infrastructure more efficiently through installation of dispersed renewable generation and also to significantly increase high-voltage transmission capacity in the state.³⁹⁵ The DRG Study focused on the ability to install dispersed renewable generation into the existing transmission system, but also demonstrated the need for increased high-voltage transmission.

348. NAWO/ILSR contended that the Applicants have perpetuated an outdated paradigm by injecting large amounts of generation into its models and that CapX may foster the development of large transmission and impede small, dispersed generation.³⁹⁶

349. Under some circumstances, reliable generation and strategic lower voltage enhancements may displace the need for some higher voltage transmission.³⁹⁷ However, NAWO/ILSR failed to show that addition of several small generators would be more cost-effective than a large generation plant. The Applicants estimated that a 168 MW combustion turbine would cost at \$541 per kW while a smaller 29 MW combustion turbine would cost about \$1,416 per kW.³⁹⁸ Without closer examination of the specific facility, its use, and the transmission improvements it would require, it is not possible to conclude that siting small generation would be more cost-effective than the Applicants' proposal. Mr. Alholinna, the Team Lead for the DRG Study, stated that the study did not demonstrate that "finding sites with smaller amounts of generation outlet has an

³⁹³ Ex. 199 at 15 (Schedin Surrebuttal).

³⁹⁴ Ex. 195 at 10-11 (Schedin Rebuttal); Ex. 199 at 16 (Schedin Surrebuttal).

³⁹⁵ Ex. 110 at 3.

³⁹⁶ Ex. 140 at 16-17, 35-36 (Michaud Direct).

³⁹⁷ T. 6 at 119 (Kline).

³⁹⁸ Ex. 1 at 7.14 (Application).

advantage over large generation plants.”³⁹⁹ Specifically, Mr. Alholinna did not believe that the DRG Study findings affected the need for the CapX projects.⁴⁰⁰

350. NAWO/ILSR incorrectly argued that the burden is on the Applicants to produce a model that added dispersed generation, and to conduct the appropriate power flow analysis up to the level that the system reliability, local load serving benefits, and renewable generation support were comparable to CapX. In its view, the Applicants are required to run that model to meet their burden of proof, and their failure to do so restricts the ability to compare that alternative.⁴⁰¹

351. NAWO/ILSR overstated the utilities’ obligation to analyze alternatives. The certificate of need statute requires Applicants to consider whether distributed generation, among other options, is an alternative to meet energy demand.⁴⁰² In developing each CapX project, the Applicants looked at a variety of alternatives, including siting local generation. They concluded that those alternatives were not cost effective or failed to provide the same overall benefits to the transmission system as the CapX projects. OES also considered dispersed generation as an alternative but concluded that it could not address the scope of the needs addressed by CapX.⁴⁰³ The Applicants were not required to conduct the specific analysis NAWO/ILSR and NoCapX requested.

352. Similarly, NoCapX contended that dispersed wind generation can be sited locally to meet the RES without transmission. It contended that the Applicants did not consider taking existing generation off-line to make room for renewable generation.⁴⁰⁴ NoCapX failed to explain how replacing one form of generation with another would increase regional reliability or address identified community needs.

353. Several studies were underway at the time of the hearing in this proceeding that may provide the type of information that will allow for the analysis that NAWO/ILSR, CETF and NoCapX advocates, but at this time, results are incomplete and no reasonable alternative has been proposed to provide the generation outlet capability that the Brookings Project can provide.

354. Since it takes many years to plan and build transmission lines, states have attempted to construct new lines into areas with high wind resources, thereby increasing the likelihood that renewable generation will connect to the planned lines and that renewable energy standards will be met.⁴⁰⁵ The DRG Study does not support NAWO/ILSR’s contention that developing smaller sized, dispersed wind generators closer to load will change the type of transmission facilities needed.⁴⁰⁶ Rather, the DRG

³⁹⁹ T. 11 at 69 (Alholinna).

⁴⁰⁰ T. 11 at 70 (Alholinna).

⁴⁰¹ NAWO/ILSR Posthearing Brief at 11-12.

⁴⁰² Minn. Stat. § 216B.243, subd. 3 (6); NAWO/ILSR Posthearing Brief at 9.

⁴⁰³ Ex. 282 at 28-29 (Rakow Direct).

⁴⁰⁴ NoCapX Posthearing Brief at 17.

⁴⁰⁵ Ex. 175 at 6-7 (Gramlich Rebuttal).

⁴⁰⁶ Ex. 148 at 18 (Michaud Rebuttal).

Study concluded that small injections of dispersed generation tend to flow on the high-voltage grid in the same manner as larger scale generation.⁴⁰⁷

355. The DRG Study supports the Applicants' contention that existing constraints on the high-voltage system limit the potential for all types of new renewable generation, both dispersed and larger-scale.⁴⁰⁸

356. NAWO/ILSR asserted that the total cost of delivered energy, both the cost of generation and transmission, is the appropriate basis for analysis of alternatives.⁴⁰⁹ CETF witness Kildegaard concurred with NAWO/ILSR that evaluation of the CapX projects required analysis of the cost of the transmission and the cost of the related generation expansion.⁴¹⁰

357. Others disagreed that it was reasonable to attempt to analyze the precise impact that transmission will have on future generation.⁴¹¹

358. The Commission has two distinct planning processes. The IRP establishes each utility's plans to expand generation, including both supply-side and demand-side growth. Biennial transmission planning is a different process, undertaken jointly by the utilities to evaluate the need for new transmission to meet projected growth.⁴¹² Although in theory, planning generation and transmission together is reasonable, the elements are continually changing and the range of options is unlimited. Practicality dictates that the two processes are separate, but that each process is informed by the other.⁴¹³

359. In summary, NAWO/ILSR failed to propose a more reasonable and prudent alternative to the CapX projects.

B (2). The Cost of the Proposed Facility and the Energy Supplied by It, Relative to Reasonable Alternatives.

360. The capital costs for the Proposed Projects and the Upsized Alternative are summarized in Attachment F, attached to this Report.⁴¹⁴

361. As part of each of the underlying studies that led to the Application, the Applicants evaluated several options, including the costs associated with them. No party questioned the specific costs included in the calculations. The analysis of line losses was included in evaluation of the higher-voltage alternatives.

⁴⁰⁷ Ex. 110 at 12; *see also*, Ex. 176 at 2-3 (Gramlich Surrebuttal).

⁴⁰⁸ *See also*, Ex. 176 at 2-3 (Gramlich Surrebuttal).

⁴⁰⁹ Ex. 140 at 44 (Michaud Direct).

⁴¹⁰ Ex. 161 at 4 (Kildegaard Direct).

⁴¹¹ Ex. 175 at 9 (Gramlich Rebuttal).

⁴¹² Ex. 303 at 17-18 (Rakow Rebuttal).

⁴¹³ *Accord*, Ex. 303 at 19-20 (Rakow).

⁴¹⁴ Cost estimates are stated in 2007 dollars. Ex. 1 at 2.17 (Application).

Cost to Minnesota Customers

362. It is difficult to estimate the cost of the CapX project to Minnesota customers. Once the projects are on line, MISO allocates the costs for transmission based on a formula which takes into account the purpose of the line and the portions of the MISO footprint that will benefit from the improved reliability that the new lines add to the system. Whether MISO classifies the proposed projects as a Baseline Reliability project or a Generator Interconnection Network Upgrade will affect the cost allocation.⁴¹⁵ The Applicants expect that the Fargo Project and Brookings Project and 80 percent of the La Crosse Project will be subject to the MISO formula. The Applicants estimated the projects' revenue requirements and allocated the costs to the MISO pricing zones. Then, it estimated the charges to the CapX owners, based on projected ownership shares. Its analysis was premised on MISO classifying each of the three CapX projects as Baseline Reliability projects.⁴¹⁶

363. OES developed a rough estimate of the impact of the increased cost of the CapX projects to Minnesota customers. Based on those estimates, a residential customer using 800 kWh of electricity per month would see an increase ranging from approximately 40 cents per month for a Minnesota Power customer to a \$2.15 per month for an Xcel Energy customer (with a very small decrease for Wisconsin Public Power customers). The estimate took into account the benefit of lower line losses but did not include the costs or savings of the Upsized Alternative.⁴¹⁷

364. The actual costs will depend in part on the ultimate distribution of ownership among the participating utilities. The OES estimates are based on the Applicants' preliminary ownership structure, but the total project cost could vary between \$0.88 billion (low costs, all public power ownership), and \$1.77 billion (high costs, all investor owned).⁴¹⁸

365. NAWO/ILSR hypothesized that Minnesota ratepayers may be double-billed for the Brookings line, once by MISO for allocation of the cost of the lines to serve load, and also for the portion of the costs borne by generators to connect and deliver energy to Minnesota consumers.⁴¹⁹ There are components to the rates customers pay for electricity, including a portion for transmission and a portion for the cost of the energy, including generation. Thus, to the extent that the CapX lines provide transmission that serves Minnesota customers, the customers will pay some of the cost. If new generation is added that also serves Minnesota customers, the cost of generation may include the generator's costs to connect to the transmission system, but that is not the same as the cost of transmission itself.

366. Some members of the public expressed concern that long transmission lines will have costly, high line losses. In their view, such losses are wasteful and can

⁴¹⁵ Ex. 2 at D-5 (Application); T. 5B at 69 -71 (Webb).

⁴¹⁶ Ex. 2 at D-5 (Application); Ex. 137 at 2-3 (Grover Direct).

⁴¹⁷ Ex. 310; T. 24 at 122-124; T. 25 at 41-42, 47-49 (Rakow).

⁴¹⁸ Ex. 282 at 70 (Rakow Direct).

⁴¹⁹ NAWO/ILSR Brief at 36.

be reduced by siting generation closer to load.⁴²⁰ Dr. Rakow closely analyzed the line losses of several options and concluded that the CapX projects would in fact reduce line losses.⁴²¹

367. By connecting into the 345 kV networks that serve the Twin Cities, the combined projects will improve access to existing and future resources within the MISO market. This can be expected to lower on average marginal energy prices in the near term and in the long term ensure adequate energy supplies to the Twin Cities and surrounding area.⁴²²

368. MISO supported the CapX projects in part because of the economic benefit the transmission lines will provide. By extending in different directions, the new lines will give utilities access to the most cost-effective generation available across a broad geographic area.⁴²³

B (3). The Effects of the Proposed Facility Upon the Natural and Socioeconomic Environments Compared to the Effects of Reasonable Alternatives.

Effect on the Land and Its Inhabitants

369. The Application contains a general discussion of the natural features along the corridors of each proposed transmission line and detailed maps of each route segment.⁴²⁴ Each project corridor includes managed and regulated land, including municipal and county parks and trails, trust lands, state trails, trout streams and other public waters, federal easement lands, forest lands, Wildlife Management Areas, Waterfowl Protection Areas, state parks, National Wildlife Refuges and Scientific and Natural Areas. All three projects involve crossing at least one major waterway, and there are airports in each project area.

370. The public raised concerns that the construction of a transmission line will decrease the value of the property it crosses or borders.⁴²⁵ The ER references a Wisconsin Public Service Commission analysis that made six general observations that OES apparently accepts:

- a. The potential reduction in sale price for single family homes may range from 0 to 14 percent.
- b. Adverse effect on the sale price of smaller properties could be greater than effect on the sale price of larger properties.

⁴²⁰ Pub. T., Tab 3, Bennett (Alexandria); Tab 18, Easter (Rochester); Pub. Comm., Maass, filed 10/06/08, #5551877; Lusk, filed 7/31/08, #5405095.

⁴²¹ See Ex. 308 at 3 (Rakow Statement).

⁴²² Ex. 56 at 37 (Webb Direct); Ex. 257 at 4-5 (Ham Direct).

⁴²³ Ex. 56 at 37 (Webb Direct); T. 4 at 156 (Webb).

⁴²⁴ Ex. 1 at Chapter 8, Ex. 2 at E-1, E-2, E-3 (Application).

⁴²⁵ Pub. T., Tab 5, Lieder, Shore, Sypnieski (Clearwater); Tab 11, Magnussen (New Prague); Tab 13, Herschberger-Ligan (Lakeville); Tab 18, Easter (Rochester).

- c. Other amenities, such as proximity to schools or jobs, lot size, square footage of a house and neighborhood characteristics, tend to have a much greater effect on sale price than the presence of a power line.
- d. The adverse effects appear to diminish over time.
- e. Effects on sale price are most often observed for property crossed by or immediately adjacent to a power line, but effects have also been observed for properties farther away from the line.
- f. The value of agricultural property is likely to decrease if the power line poles are placed in an area that inhibits farm operations.⁴²⁶

371. The ER reached no conclusion about the effects on property value except to state: “In the matter of property values, potential impacts would typically be negotiated in an easement agreement between the Applicants and the landowner.”⁴²⁷ However, some members of the public objected that the eminent domain process was inherently unfair because of the power imbalance between an individual landowner and the utility.⁴²⁸

372. New transmission lines will have a significant visual impact.⁴²⁹ Several members of the public expressed their concern about the impact the towers would have on the aesthetics of rural areas.⁴³⁰ Typically, both a single-circuit 345 kV line and a double-circuit 345 kV line require a 150-foot right-of-way. The 161 kV lines require 70 to 80 feet of right-of-way. The right-of-way may be narrower where it follows a pre-existing transmission line, road or pipeline corridor. Typically, the towers for 345 kV single-circuit lines will be 105 to 150 feet high, with approximately 750 to 1100 feet between spans. Double-circuit 345 kV lines will be 130 to 175 feet high, with approximately the same spans. The lower voltage lines typically have lower towers but shorter spans.⁴³¹

373. Since much of the land in the proposed corridors is flat or rolling and open, the structures and lines will be visible from long distances. The visual impact can be somewhat minimized during the siting, but for most people the overall aesthetic effect would be negative. The Environmental Report identified areas of high visual sensitivity and possible mitigation.⁴³² Placement under ground is not practical in light of the length of the lines and the associated expense. In addition, underground are more difficult and expensive to maintain and repair.⁴³³

⁴²⁶ Ex. 5 at 14.

⁴²⁷ *Id.*

⁴²⁸ Pub. T., Tab 10, Mayer (Arlington); Tab 13, Topp (Lakeville).

⁴²⁹ Ex. 1 at 8.3 (Application).

⁴³⁰ Pub. Comm., Bigaouette, filed 7/31/08, #5405084; Chipps, filed 10/6/08, #5551878; VanOverbeke, Groshek, Howe, Morse, filed 10/06/08, #551881; Miller, filed 10/06/08, #5520590.

⁴³¹ Ex. 1 at 2.10 (Application).

⁴³² Ex. 5 at 17-19.

⁴³³ Ex. 1 at 2.11 (Application).

374. Human settlement, including homes and potential development, will be affected.⁴³⁴ Lezlie and Jason LaVoy of Milroy would prefer to have a wind turbine on their farm than a transmission tower, which could affect their electronic equipment and ability to farm.⁴³⁵ Elmer Green lives on a farm in Lynd. He supports the need for a power line but wants the line to bypass housing, and to avoid damaging farm drainage systems or having an adverse effect on his ability to farm.⁴³⁶ Keith and Cheryl Miller of Marshall fear that the transmission line could run within 120 feet of their home. Dan and Rose Bot of Cottonwood advocate for running the lines along road and railroad rights-of-way to minimize the effect on homeowners.⁴³⁷

375. All three projects would affect agricultural lands, including significant “prime farmland,” as defined by federal law.⁴³⁸ Some citizens expressed their concern about the loss of forest and agricultural land⁴³⁹ and about the detrimental impact the CapX projects could have on private land and the ability to farm.⁴⁴⁰ James Mayer, speaking on behalf of Cornish Township, said that the utilities’ heavy equipment damaged township roads during previous construction and that the townships were not adequately compensated for the damage.⁴⁴¹

376. Since the routing process has not begun, there are no estimates in this record of the amount of new or expanded right-of-way that would be required or the proportion that would follow existing rights-of-way.

377. There are archeological sites and historic sites in each project area.⁴⁴²

378. Threatened and endangered species are found along virtually every segment of the three project corridors, and each of the three projects could have an impact on them.⁴⁴³ Danger to migrating birds was a special concern for many members of the public. John and Susan Greening and Reverend Howard Larsen of La Crescent,⁴⁴⁴ and Jeanne Dukerschein, a natural resources professional in La Crescent, feared that the La Crosse Project could damage and fragment habitat with a negative effect on the migrating birds. Her concern was shared by Julia Crozier of Fountain City, who noted that the river birds and other river animals are already under major environmental stress, with a resulting decline in species on the river.⁴⁴⁵

⁴³⁴ Ex. 1 at 8.4 (Application).

⁴³⁵ Pub. Comm., LaVoy, filed 10/06/08, #5551881.

⁴³⁶ Pub. Comm., Green, filed 9/24/08, #5520583.

⁴³⁷ Pub. Comm., Miller, Bot, filed 9/24/08, #5520590.

⁴³⁸ See, 7 C.F.R. § 657.5 (a)(1).

⁴³⁹ See, e.g., Pub. T., Tab 18, Easter, Forhan (Rochester); Tab 11, Pickit, Hartung (New Prague); Tab 12, Otto (Lakeville); Tab 15, Friend (Cannon Falls).

⁴⁴⁰ Pub. Comm., Henry, LaVoy, Van Schaik, Bot, Kluver, Van Keulen, filed 10/06/08, #5551881; Tupy, affidavit, # 5551879; Rohlik, filed 10/06/08, #5551880; Prchal, Bot filed 9/24/08, #5520590.

⁴⁴¹ Pub. T., Tab 10, Mayer (Arlington).

⁴⁴² Ex. 1 at 8.4 (Application).

⁴⁴³ Ex. 1 at 8.3 (Application); Ex. 5, Part 3.0.

⁴⁴⁴ Pub. Comm., Greening, filed 8/25/08, #5464476; Larsen, filed 9/22/08, #5518689.

⁴⁴⁵ Pub. Comm., Dukerschein, filed 9/22/08, #5518690; Crozier, filed 6/18/08, #5286821. See also, Pub. T., Tab 17, Joe Morse, Bluff Land Environment Watch (Winona).

379. Several public comments, including those by Xcel Energy stockholders Leo and Marilyn Smith, addressed the possible degradation of the beautiful Mississippi River bluffs, scenic by-way, and adjacent protected land that provides crucial habitat for plants and animals.⁴⁴⁶

380. During the routing process, more detailed information will be collected. However, the Applicants concluded that, based on the level of review required for the certificate of need, there were no environmental issues that would preclude construction of these facilities.⁴⁴⁷

381. The ER concluded that the proposed projects will have a significant impact on the land that they traverse, and that, in particular, the projects will require approaching, crossing or proximity to the Minnesota and Mississippi Rivers:

The Minnesota River and Mississippi River valleys contain large tracts of state and federally protected lands, many cities, biologically outstanding lands, high scenic values, and cultural resources. *In most cases* the mere presence of these resources does not prohibit new or rebuilt transmission infrastructure, [but] the presence of and potential impacts to these resources may limit routing options or require special mitigation measures. The presence of and potential impacts of these resources are an important factor for the public and the PUC to consider at the [certificate of need] and at the routing stages of the regulatory process.⁴⁴⁸

382. There are alternatives for river crossings. However, both overhead and underground alternatives require cleared rights-of-way for construction and maintenance, both will disrupt the river during construction and both will have a visual impact on each shore. Underground facilities are generally 10 times more costly than overhead facilities, more difficult to repair, and may require more equipment and time to construct. Construction of underground facilities may also pose greater environmental risk.⁴⁴⁹

383. The ER did not recommend specific mitigation or reach a conclusion about whether any route could be found within the proposed corridors that would do no lasting damage to the Minnesota River and Mississippi River valleys. However, the OES witness opined that each corridor had at least one possible route with feasible river crossings that, with proper mitigation, would not significantly degrade the natural environment.⁴⁵⁰

⁴⁴⁶ Pub. T., Tab 17, Smith (Winona), and Pub. Ex. 32; Pub. Comm., Edon, Hammes, Heisel, filed 9/22/08, #5518690; Blum, Timmerman, filed 8/25/08, #5464476; Acevedo, Krenz, Morse, Howe, filed 10/06/08, #5551881; Cerwin, Karoll, Breidel, filed 9/24/08, #5520590; Eisley, Larsen, filed 9/22/08, #5518689.

⁴⁴⁷ Ex. 1 at 8.1 (Application); Ex. 128 at 6, 12, 13, 19 (Rasmussen Direct).

⁴⁴⁸ Ex. 5 at 93 (emphasis added).

⁴⁴⁹ Ex. 1 at 9.10-9.11 (Application).

⁴⁵⁰ T. 18A at 27-29, 33-34, 37-38, 44-45 (Birkholz).

384. In addition to the overall impact of the projects, each of the three projects has specific environmental considerations.

385. For the La Crosse Project, consideration must be given to minimizing the impact of major crossings of the Mississippi and Cannon Rivers, routing and construction in the forested and bluffland areas in the southern portion of the project area, and routing in the densely populated areas of Rochester, La Crosse and Winona.⁴⁵¹ The ER identified a 350-acre area north of Rochester called “Evergreen Acres” that contains some of the largest areas of undeveloped lands and habitat in Olmsted County and several endangered species. Conservation easements have been placed on the land. Efforts should be made to avoid interrupting contiguous natural features and unfragmented parcels.⁴⁵² The Applicants’ environmental analysis included discussion of the issues related to the Prairie Island Substation, but the Applicants dropped that substation connection from the La Crosse Project.⁴⁵³

386. For the Fargo Project, consideration must be given to routing near extensive water features in the central portion of the project area, the Mississippi River migratory flyway, sensitive scenic resources, including scenic by-ways, routing in the densely populated areas around Fargo, Stearns County and Monticello, and the feasibility of routing along the Interstate 94 Corridor.⁴⁵⁴

387. The ER gave special attention to the large Avon Hills area of Stearns County, which includes Avon and Collegeville Townships and parts of four others. It includes an “Important Bird Area,” one of the most critical areas in the state for the conservation of bird populations. Avon Hills includes wildlife protection areas managed by the U.S. Fish and Wildlife Service and two DNR Scientific and Natural Areas. Clearing a corridor for the transmission lines through the area could significantly fragment the habitat with a serious impact on the many forest bird populations. Efforts are underway to protect approximately 50,000 acres because “a significant proportion of the remaining natural vegetation and rare plants and animals of the entire county lie within this relatively small geographic area.” The area is shown on Map 12 of the ER.⁴⁵⁵

388. For the Brookings Project, consideration must be given to minimizing the impact of major crossings of the Mississippi, Minnesota and Redwood Rivers, impact on migratory birds, routing and construction in prime farmland, gneiss outcroppings near Granite Falls, several Scientific and Natural Areas, sensitive scenic resources, impact on the Upper Sioux Community and Lower Sioux Community, and routing in the densely populated areas in Scott, Carver and Dakota Counties.⁴⁵⁶ In particular, the Minnesota River Valley presents several challenges because of its scenic resources and archeologically rich areas. Crossing to the Minnesota Valley Substation will be difficult

⁴⁵¹ Ex. 1 at 8.5-8.22 and Ex. 2, E-1 (Application); Ex. 128 at 7-12 (Rasmussen Direct).

⁴⁵² Ex. 5 at 49.

⁴⁵³ Ex. 2, E-1 at 56.

⁴⁵⁴ Ex. 1 at 8.22-8.27 and Ex. 2, E-2 (Application); Ex. 128 at 12-13 (Rasmussen Direct).

⁴⁵⁵ Ex. 5 at 63.

⁴⁵⁶ Ex. 1 at 8.27-8.36 and Ex. 2, E-3 (Application); Ex. 128 at 14-19 (Rasmussen Direct).

because of the variety of natural resources at the crossing, including threatened and endangered species, prairie and wetlands, and the constrained area.⁴⁵⁷

389. The ER reiterated the challenge of crossing the Minnesota River and possible degradation of its river valley with its “outstandingly remarkable values of national significance (scenery, recreation, wildlife, and history),” and the need to protect the Minnesota Valley Scenic Byway that parallels the river.⁴⁵⁸

390. If approved, routing approvals and other local, state and federal approvals would be required. A list of possible permits is included in the Application at 8.37-8.38. Many of the permits are intended to mitigate environmental impact.

391. A transmission line’s operating characteristics have an effect on the natural environment. Some chemical reactions, noise, electric and magnetic fields and interference with electromagnetic signals occur around conductors.

Ozone and Nitrogen Oxide Emissions

392. Corona is an ionization of air within a few centimeters of the conductor. This breakdown of air around the conductors can generate audible noise, radio frequency noise, light, ozone, other products and energy loss. Any imperfection or irregularity on a conductor, including a scratch or water droplet, can cause corona. During good weather, discharges are insignificant. However, during wet weather, water droplets on the conductor’s surface increase corona discharges.⁴⁵⁹

393. Corona can produce ozone and oxides of nitrogen. However, because the natural production rate of ozone is directly proportional to temperature and sunlight, and inversely proportional to humidity, the same factors that increase corona discharges from transmission lines inhibit production of ozone. Ozone is very reactive and is relatively short-lived.

394. The national standard for ozone emission into the air is 0.08 parts per million (ppm) for an eight-hour average period, and the state standard is 0.08 ppm based upon the fourth-highest eight-hour period daily maximum average in one year. The 0.0007 ppm concentration for a 345 kV transmission line is well below the federal and state standards.⁴⁶⁰

Audible Noise

395. Audible noise generally increases with the voltage of the line – the higher the voltage, the higher the noise.⁴⁶¹ In Minnesota, statistical sound levels (L Level Descriptors) are used to evaluate noise levels and identify noise impacts. L₅ is defined

⁴⁵⁷ Ex. 2, E-3 at 45-46 (Application); Ex. 128 at 14-15 (Rasmussen Direct).

⁴⁵⁸ Ex. 5 at 77.

⁴⁵⁹ Ex. 1 at 9.17 (Application); Ex. 126 at 2-3 (LaCasse Direct).

⁴⁶⁰ Ex. 1 at 9.17-9.18 (Application); Ex. 126 at 3 (LaCasse Direct).

⁴⁶¹ T. 12 at 141, 153 (LaCasse).

as the noise level exceeded 5 percent of the time, or for three minutes in an hour. The L_{50} is the noise level exceeded 50 percent of the time, or for 30 minutes in an hour. Land areas are assigned to an activity category based on sensitivity to traffic noise. The Noise Area Classification (NAC) is listed in the Minnesota Pollution Control Agency (MPCA) noise regulations to distinguish the categories.⁴⁶² Household units, including farm houses, are included in Category 1,⁴⁶³ with the following noise limits, recorded in units of decibels (dBA):

Daytime: $L_{50} - 60$; $L_{10} - 65$

Nighttime: $L_{50} - 50$; $L_{10} - 55$.⁴⁶⁴

396. Figure 9-8 of the Application summarizes the audible noise associated with transmission lines of the type included in the CapX projects, under wet conditions with the highest audible noise levels.⁴⁶⁵ The figure shows that the noise level at the edge of the right-of-way for a 345 kV double-circuit line has an L_5 level of 57.7 dBA, which is higher than the nighttime L_{10} noise limit. The L_{10} level is not included in the chart. A 345 kV double-circuit line has an L_{50} noise level of 49.9 dBA, barely below the nighttime limit. None of the other values on the chart exceed the MPCA noise limits. To assure compliance with L_{10} and L_{50} nighttime limits, household units must be sufficiently far from the edge of the 345 kV double-circuit right-of-way.⁴⁶⁶

Radio and Television Interference

397. Corona from a transmission line can interfere with the reception of television and AM radio signals. AM radio interference typically occurs directly under a transmission line and dissipates rapidly within the right-of-way. Television interference can be addressed by the utility to assure that quality reception is maintained.⁴⁶⁷

Electric and Magnetic Fields

398. Electric and magnetic fields (EMF) are present around any electrical device. Electric fields are the result of voltage or electrical charges, and the intensity of the electric fields are related to the operating voltage of the line or the device. EMFs are the result of the flow of electricity or current that travels along transmission lines, distribution lines, substation transformers, house wiring and household electrical appliances. The intensity of a magnetic field is related to the current flow through the wires.

⁴⁶² Ex. 1 at 9.20 (Application).

⁴⁶³ Minn. R. 7030.0050.

⁴⁶⁴ Minn. R. 7030.0040, subp. 2.

⁴⁶⁵ Ex. 1 at 9.18-9.19 (Application); Ex. 126 at 5 (LaCasse Direct).

⁴⁶⁶ Although the transmission towers for a 345 kV single or double-circuit line will be 100 feet tall or more, for the purpose of this calculation, the analysis is based on the estimated low point of the line between towers, 36 feet above the ground. T. 12 at 140 (LaCasse).

⁴⁶⁷ Ex. 1 at 9.21-9.22 (Application); Ex. 126 at 6 (LaCasse Direct); T. 12 at 150 (LaCasse).

399. There has been a great deal of research conducted to determine whether exposure to power-line-level EMF causes biological exposure and health risks. The issue has been addressed in several prior proceedings before the Commission, and has not been of sufficient concern to prevent construction of new transmission lines. Neither the state nor federal government has established limits on exposure to magnetic fields.

400. Several members of the public expressed their concern about the health effects of the transmission lines, including the possible links to cancer.⁴⁶⁸ Joe Kenning spoke of the adverse effects a nearby line has had on his family's personal health and on his livestock.⁴⁶⁹ Robert Dahse has worked in the renewable energy field for many years. He cited studies linking EMF exposure to adverse health effects.⁴⁷⁰ Jan Rohwer of Greenvale Township expressed concern about the cancer deaths in her family.⁴⁷¹

401. Because of the continued uncertainty and public concern, the Minnesota Department of Health recommends a "prudent avoidance" policy to minimize exposure.⁴⁷²

402. Transmission lines can induce "stray voltage" when an electric distribution line runs parallel or under a transmission line. If not properly grounded, the voltage on the line may move to the ground through an object that comes in contact with it.⁴⁷³ The Applicants have committed to taking appropriate measures to prevent stray voltage problems when the transmission lines parallel or cross distribution lines.⁴⁷⁴

403. The ER discussed the general effect of new transmission lines on noise, radio and television interference, and human health and safety, including exposure to electric and magnetic fields and stray voltage. It concluded that proper placement and installation of the lines should protect the public.⁴⁷⁵

404. The ER commented specifically on the World Health Organization's recent review of the health implications of electromagnetic fields, and, in particular, the possible link between exposure and incidence of childhood leukemia. Although the WHO could not conclude that there was a causal link, there is still troubling evidence of increased risk of childhood leukemia associated with average exposure to residential power-frequency magnetic field of about 0.3 to 0.4 micro Teslas (0.03 to 0.04 milliGauss).⁴⁷⁶ This average exposure range is several times less exposure than the

⁴⁶⁸ Pub. T., Tab 15, Rohwer (Cannon Falls); Pub. Comm., Hanson, Donabauer, filed 8/08/08, #5417357.

⁴⁶⁹ Pub. T., Tab 5, Kenning (Clearwater).

⁴⁷⁰ Pub. Comm., Dahse, filed 9/22/08, #5518686.

⁴⁷¹ Pub. T., Tab 15, Rohwer (Cannon Falls). See also, Pub. Comm., Dahse, filed 9/22/08, #5518686; Teschler, filed 8/25/08, #5464470; Magnussen, filed 8/25/08, #5464472; Hanson, Donabauer, filed 8/08/08, #5417357.

⁴⁷² Ex. 1 at 9.24 (Application); Ex. 126 at 6 (LaCasse Direct).

⁴⁷³ T. 12 at 159-160 (LaCasse).

⁴⁷⁴ Ex. 1 at 9.31 (Application).

⁴⁷⁵ Ex. 5 at 28-29.

⁴⁷⁶ Ex. 5 at 27; see also, Pub. Comm., Otto, filed 9/24/08, #5520587 (August 31, 2007, BioInitiative Report: A Rationale for a Biologically-based Public Exposure Standard for Electromagnetic Fields (ELF and RF)).

“Peak Magnetic Field at ROW Edge,” in milliGauss (mG), expected for the three projects. The estimated “Peak Magnetic Field at [right-of-way] Edge” is estimated to range from 0.4 mG to 92 mG, and the largest number of estimates for the various components of the projects clustered between 15 and 30 mG.⁴⁷⁷ The record is unclear about the distance from the proposed projects that would be required to reduce the exposure level below 0.3 to 0.4 micro Teslas.⁴⁷⁸

405. The ER pointed out that there are many sources of exposure to magnetic fields, including household appliances and computers, although it is difficult to compare the typical length of exposure.⁴⁷⁹

406. Many members of the public expressed concern about the lack of definitive evidence that exposure to transmission lines is safe, including some who have felt the effects of nearby lines or stray voltage, and requested extra precautions.⁴⁸⁰

407. In light of the on-going concern about the possible effects of the transmission projects, members of public recommended use of the “precautionary principle,” routing the transmission lines to avoid human exposure and minimize the possible health impact.⁴⁸¹ Members of the public offered suggestions to mitigate EMF, including wider easements, additional technology to sheathe power lines, and elimination of the higher voltage lines.⁴⁸²

Effect of CapX on Development of Coal Generation

408. There was considerable controversy during the proceeding about whether the proposed projects would stimulate additional coal generation in North or South Dakota. Many assumed that the CapX projects would be a conduit for coal generation and expressed their concern about coal generation’s greenhouse gas emissions, contribution to global warming, and general unsustainability.⁴⁸³

409. One basis for the concern was that the Fargo Project will increase the North Dakota Export limit, the amount of electricity that can be transmitted from the west into Minnesota. The source of the generation is neither determined nor limited by this proceeding. It is not possible on this record to assign a probability to the concern that coal generation will connect and flow into Minnesota. Other proceedings will dictate whether and where new coal generation develops, and MISO will determine the specific

⁴⁷⁷ Ex. 5 at 25-26.

⁴⁷⁸ See T. 18A at 31 (Birkholz).

⁴⁷⁹ Ex. 5 at 26.

⁴⁸⁰ See, e.g., Pub. T., Tab 6, Hagerstrom, Zabinski (Clearwater); Tab 7, Dacey (Marshall); Tab 9, Turbes (Redwood Falls); Tab 11, Ruhland (New Prague); Pub. Comm, Otto, filed 9/24/08, # 5520590; Beach, filed 7/31/08, # 5405084; Holleran, filed 10/06/08, #5551881, Babcock, filed 9/24/08, #5520585.

⁴⁸¹ Pub. T., Tab 13, Diffley (Lakeville); Pub. Comm., Dailey, filed 8/08/08, #5417357, Brown, filed 8/25/08, #5464476, Turner, filed 9/22/08, #5518690.

⁴⁸² See, e.g., Pub. Comm., Otto, Filed 9/24/08, #5520590.

⁴⁸³ See, e.g., Pub. T., Tab 15, Moskl, Halley (Cannon Falls); Tab 13, Frerichs (Lakeville); (see also Public Hearing Ex. 18); Tab 12, Topp, Olstad, Budenski (Lakeville); Tab 17, T. Tollefson (Winona); Tab 19, Hoffman, Muller-Green (Rochester); Tab 16, Paddock (Winona). See also, Pub. Ex. 14, 15, 16.

generation that will connect to the proposed projects. However, with the enactment of the Minnesota Greenhouse Gas Emission law, it is unlikely that new coal generation will develop in this state, and the same law may discourage development to the west to meet Minnesota load.

410. MISO's planning document, MTEP 2007, includes 229 active projects, of which 33 have signed interconnection agreements and expected in-service dates prior to 2016. These are expected to add 7,945 MW of capacity to the MISO market footprint, 4,511 MW of coal projects, 1,805 MW of gas-fueled, combined-cycle projects and 1,008 MW of wind projects. None of these projects have interconnection agreements conditioned on the Brookings Project. Conversely, none of these projects would be displaced from their positions in the queue by interconnecting additional wind projects to the Brookings Project.⁴⁸⁴

411. Some parties and members of the public feared that the CapX projects would support Big Stone II expansion and objected to any project that would facilitate that expansion and its mercury emissions.⁴⁸⁵ There is no evidence that the CapX projects are needed to serve Big Stone II. The CapX projects are not included in the Big Stone II transmission studies, and Big Stone II has an interconnection request at MISO that does not involve connection to any of the CapX facilities.⁴⁸⁶ It is not possible to determine what effect, if any, subsequent changes in Big Stone II will have on the CapX projects.

412. Some parties and many members of the public were concerned that the CapX project was a subterfuge to move coal-fired power from points west of Minnesota to Minnesota or states to the east. Neither OES, nor MCEA witness Ellison, could find any rational basis for this concern.⁴⁸⁷ The basis for the study, analysis, and design of CapX was to serve Minnesota load.⁴⁸⁸

413. Although there was evidence that up to 600 MW of dispersed generation could be sited without construction of new generation, there was no specific alternative presented that would alleviate the need for any one of the three projects. Moreover, the DRG Study presumed that dispersed generation would replace existing generation, not supplement it. Thus, even if more dispersed generation was added, it would not reduce the projected need for new generation and new transmission to connect to it.

414. The ER included the required review of specified alternatives.⁴⁸⁹ Alternatives were not discounted because they could not meet all of the identified need,

⁴⁸⁴ Ex. 59 at 37; T. 5B at 17-20 (Webb).

⁴⁸⁵ NAWO/ILSR Posthearing Brief at 16; NoCapX Posthearing Brief at 21; CETF Posthearing Brief at 54; Pub. T., Tab 2, Wika (Fergus Falls); Tab 3, Campbell, Jensen (Alexandria); Tab 16, Paddock (Winona); Pub. Comm. Pierce, filed 10/116/08, #5567282; Braun, filed 9/22/08, #5518690; Schoofs, filed 8/08/08, #5417357; Crozier, filed 6/18/08, #5286821.

⁴⁸⁶ T. 2B at 61 (Rogelstad) T. 10 at 127 (Alholinna).

⁴⁸⁷ Ex. 303 at 30-31 (Rakow Rebuttal); T. 25 at 73, 80-81 (Rakow); T. 24 at 66-69 (Ham); T. 21 at 49 (Ellison).

⁴⁸⁸ See, e.g., T. 25 at 73 (Rakow).

⁴⁸⁹ Minn. R. 7849.7060, subps. 1 and 6. No alternatives were offered for consideration.

but were evaluated for what they could contribute to the need, and the environmental impact.⁴⁹⁰ Among those, it evaluated an alternative with transmission sufficient to provide outlet for 800 MW of wind generation and four natural gas generation facilities with associated pipeline and transmission infrastructure to provide new generation in Rochester, La Crosse, Alexandria and Saint Cloud. This was referred to as the “generation alternative.”⁴⁹¹

415. Although the generation alternative could be constructed, it did not achieve comparable regional reliability or local load-serving and could require significant investment in transmission infrastructure.⁴⁹²

416. The ER evaluated whether conservation or demand-side management could replace the 4000 to 6000 MW of increased demand identified by the Applicants, but did not analyze whether a smaller portion of the increased demand could be met by either conservation or demand-side management.⁴⁹³ OES acknowledged that over time, greater energy savings are likely, but because most Minnesota utilities have not yet achieved the level of energy savings required by the conservation statute, it made no effort to factor a reduction into the demand through 2020 that would exceed the statutory requirement.⁴⁹⁴

417. The RES reflect Minnesota’s policy to promote increased renewable generation. Because of the wind resources available, it is anticipated that much of the RES will be met with wind, and, in particular, that Xcel will require additional wind development to meet its RES milestones. Transmission limitations are the most significant barrier to wind energy development.⁴⁹⁵ Although the Applicants cannot limit access to transmission lines to wind generation, construction of additional transmission lines is essential to interconnecting additional wind generation.⁴⁹⁶

Economic Benefits of Construction and Operation

418. The ER concluded that there are likely to be short-term increases in spending during construction that may benefit the local economy, but no additional permanent jobs created by the projects. The new transmission lines, new substations, and upgrades to existing facilities may increase local tax base with incremental increase in revenues from utility property taxes.⁴⁹⁷

419. Applicants estimate that 200 to 250 workers will be employed on the three projects, spread across the worksites. Long-term, the transmission lines and substation additions will increase local tax base resulting from the incremental increase in

⁴⁹⁰ Ex. 5 at 78-79.

⁴⁹¹ Ex. 5 at 80.

⁴⁹² Ex. 5 at 89-90.

⁴⁹³ Ex. 5 at 90; T. 17B at 9 (Birkholz).

⁴⁹⁴ *Id.*

⁴⁹⁵ Ex. 171 at 10 (Gramlich Direct).

⁴⁹⁶ Ex. 56 at 33 (Webb Direct); T. 5B at 23-24 (Webb).

⁴⁹⁷ Ex. 5 at 13.

revenues from utility property taxes. Nearby communities may have some short-term benefit from expenditures by workers during construction.⁴⁹⁸

420. Transmission lines require little maintenance and are typically available 99 percent of the time. The principal operating and maintenance cost is for regularly scheduled inspections - monthly by air, and once a year on the ground. Substations require periodic site and equipment maintenance.⁴⁹⁹

421. Overall, the proposed transmission lines will reduce line losses and the associated pollution including greenhouse gases, relative to the level without the CapX projects.⁵⁰⁰ Moreover, since the source of generation that will be served is not known, the incremental impact of varying forms of generation cannot be assessed.

422. Renewable energy generation is intended to reduce greenhouse gases. Using the 2,275 MW of renewable energy included in the Vision Study, MCEA estimated that the CapX projects will reduce CO₂ emissions by almost 5 million tons. This is far in excess of the 500,000 tons of CO₂ that NAWO/ILSR estimated would be created by 700 miles of construction for the CapX projects.⁵⁰¹

423. In summary, the proposed transmission lines will have a substantial impact on the natural and socioeconomic environment, but no reasonable and prudent alternative with less impact has been shown that can meet the need for the CapX projects.

B (4). The Expected Reliability of the Proposed Facility, Relative to Reasonable Alternatives.

424. The NERC planning standards define reliability of the interconnected transmission system using two terms: adequacy – ability to provide customers with a continuous supply of electricity at the proper voltage and frequency virtually all of the time; and security – the ability of the system to withstand sudden, unexpected disturbances such as short circuits or unanticipated loss of system elements.⁵⁰²

425. The CapX projects are part of a longer-term plan to strengthen the transmission network to meet additional demand for electrical power anticipated by 2020 in Minnesota and parts of the surrounding states. The CapX projects are designed to increase the reliability of the overall transmission system and the reliability of service to five local areas. No alternative was proposed that would meet those needs.

⁴⁹⁸ Ex. 1 at 9.15-9.16 (Application).

⁴⁹⁹ Ex. 1 at 9.16-9.17 (Application).

⁵⁰⁰ See, Ex. 282 at 47-53 (Rakow Direct); Ex. 303 at 31-33 (Rakow Rebuttal); Ex. 307 at 2-3 (Rakow Surrebuttal).

⁵⁰¹ Ex. 140 at 31-32 (Michaud Direct); Ex. 175 at 204 (Gramlich Rebuttal); see also, Ex. 303 at 32 (Rakow Rebuttal); Ex. 308 at 3 (Rakow Statement).

⁵⁰² Ex. 257 at 6-8 (Ham Direct), citations omitted.

426. No party has demonstrated by a preponderance of the evidence that there is a more reasonable and prudent alternative to the Applicants' proposed project.

C. The Applicants Must Show that the Proposed Facility or a Suitable Modification Will Provide Benefits to Society Compatible with Protecting the Natural and Socioeconomic Environments, including Human Health.

427. The benefits of the project are increased regional reliability, more reliable service to several communities, and increased generation outlet for renewable energy.

C (1). The Relationship of the Proposed Facility, or a Suitable Modification, to the State Energy Needs.

428. The CapX projects will strengthen the transmission network to meet additional demand for electrical power anticipated by 2020 in Minnesota and parts of the surrounding states. The CapX projects will increase the reliability of service to Minnesota customers. They will also improve the ability of the transmission system to meet overall state energy needs, including compliance with the RES. No alternative was proposed that would meet those needs.

429. The proposed projects will have a significant positive effect on community reliability in Rochester, La Crosse, Southern Red River Valley, Alexandria and Saint Cloud.⁵⁰³

C (2). The Effects of the Proposed Facility Relative to Not Building the Facility.

430. The No Build Alternative would have no impact on the natural and socioeconomic environment, but the demonstrated needs for increased regional reliability of the transmission system, improved community reliability, and enhanced generation outlet cannot be met if the facilities are not constructed.

431. Some of the parties and many members of the public contend that the proposed projects will not protect or enhance the environment, but, instead, will significantly contribute to its degradation. The construction and siting of large transmission structures will have a detrimental visual effect, disturb miles of farmland, and require the taking of private property from property owners who value their land and their rural surroundings. In addition, crossing pristine areas, including but not limited to the Minnesota and Mississippi Rivers, may disturb wildlife and protected habitat. These effects should not be minimized during the routing proceeding.

432. Construction of the CapX projects will have an impact on air quality and may disturb surface water, flora, and fauna during construction. The operation of the projects will have limited air emissions.⁵⁰⁴

⁵⁰³ Ex. 257 at 1, 9-10, 19 (Ham Direct); Ex. 274 at 2 (Ham Surrebuttal).

⁵⁰⁴ Ex. 5 at 35, 37.

433. The CapX projects may interfere with the function of wetlands, lakes, rivers, and floodplains. There may be a loss of habitat, including habitat for threatened and endangered species, within the project corridors.⁵⁰⁵

434. There are no known environmental issues associated with the proposed configuration that would preclude construction.⁵⁰⁶

435. Some homes, forests, and prime farmland, may be lost or adversely affected by the proximity of the transmission lines.⁵⁰⁷

436. There may be a temporary influx of wages and expenditures during construction.⁵⁰⁸

437. If the facilities are not built, the region and some communities may experience unreliable electrical service and poor voltage support, and there will continue to be limited opportunity for generation outlet from the western part of the state.⁵⁰⁹ Every effort should be made during routing and construction to avoid harmful effects on the natural environment and, where damage is unavoidable, to significantly mitigate the impact.

C (3). The Effects of the Facility, or a Suitable Modification Thereof, in Inducing Future Development.

438. The CapX projects will address the anticipated demand growth in the project areas and throughout the transmission system. There was some concern that the location and size of the lines would inhibit the development of dispersed, small-scale wind projects, but the evidence shows that the CapX project will increase generation outlet and create the infrastructure to facilitate additional development of renewable resources.

C (4). The Socially Beneficial Uses of the Output of the Proposed Facility, or a Suitable Modification, Including Its Uses to Protect or Enhance Environmental Quality.

439. There are beneficial uses of the electricity that will be carried on these lines. There is substantial evidence that the regional stability of the electrical system and the immediate needs of several communities will require the additional capacity these projects will provide. Additional transmission lines are needed to increase the opportunity to develop new generation to help meet future RES milestones. The CapX projects will also lower line losses, with the effect of reducing generation of CO₂.

⁵⁰⁵ Ex. 5 at 36-38.

⁵⁰⁶ Ex. 128 at 6 (Rasmussen Direct); Ex. 5.

⁵⁰⁷ Ex. 5 at 13-14, 31.

⁵⁰⁸ Ex. 5 at 13.

⁵⁰⁹ Ex. 5 at 35, 80.

440. The Applicants have demonstrated that the proposed facilities will benefit society in a manner compatible with protecting the natural and socioeconomic environments.

D. The Design, Construction, or Operation of the Proposed Facility, or a Suitable Modification, Will Comply with Relevant Policies, Rules, and Regulations of Other State and Federal Agencies and Local Governments.

441. The Applicants intend to comply with all relevant policies, rules, and regulations of state and federal agencies and local governments applicable to construction and operation of the proposed transmission lines.⁵¹⁰ A list of required permits is set forth in the Application.⁵¹¹

442. OES reviewed the Applicants' list of permits. It had no reason to believe that the permits would not be granted, but deferred to the agencies for enforcement of their permit requirements.⁵¹²

443. NAWO/ILSR asserted that the Applicants cannot demonstrate that the CapX projects will comply with applicable laws and policies.⁵¹³ It cited policies that are aimed at reducing greenhouse gas emissions. However, it failed to cite any specific policy or regulation that this project would violate.

444. The record does not demonstrate that the design, construction, or operation of the proposed facilities, or the specified modifications, will fail to comply with relevant policies, rules, and regulations of other state and federal agencies and local governments.

Proposed Conditions

445. In granting the certificate of need, the Commission may impose modifications that it deems necessary.⁵¹⁴

Limiting New Generation Outlet To Renewable Energy

446. MCEA asserted that the certificates of need for each of the three projects should be subject to conditions imposed by the Commission that would ensure that any new generation outlet capacity would be dedicated to renewable energy. The Brookings Project is expected to provide approximately 700 MW of additional generation outlet capacity in the Buffalo Ridge area.⁵¹⁵ The Fargo Project will cross a wind-rich area in northwestern Minnesota and eastern North Dakota and provide additional generation support of approximately 350 MW.⁵¹⁶ The La Crosse Project is

⁵¹⁰ Ex. 1 at 1.21 (Application).

⁵¹¹ Ex. 1 at 8.37-8.38 (Application).

⁵¹² Ex. 282 at 83-84 (Rakow Direct).

⁵¹³ NAWO/ILSR Post-hearing Brief at 19 *et seq.*

⁵¹⁴ Minn. Stat. § 216B.243, subd. 5.

⁵¹⁵ Ex. 104 at 2, 5 (Alholinna Direct).

⁵¹⁶ Ex. 67 at 12 (Kline Direct); Ex. 70 at 7 (Kline Rebuttal).

expected to enhance the deliverability of wind generated power from southeastern Minnesota and, in conjunction with the RIGO projects, will allow outlet capability beyond 900 MW and assist utilities in meeting the 2016 RES milestones.⁵¹⁷

447. MCEA witness Schedin concluded that all three projects would create new generation outlet capacity.⁵¹⁸

448. MCEA proposed several conditions to assure that new generation outlet capacity will be dedicated to renewable generation:

a. Applicants sign power purchase agreements (PPAs) with renewable energy developers or commit to utility-owned renewable generation projects to use the new capacity on the transmission lines at least two years prior to the expected in-service date of those lines; and seek Commission approval of those commitments within six months of execution.

b. Applicants make a compliance filing within 30 days of obtaining the certificates of need, detailing the allocation of the new transmission capacity among the Applicants. The compliance filing must address: how much capacity will be enabled by the three new transmission lines; the allocation of the capacity among the Applicants; and the type of MISO transmission service the Applicants will seek to serve the renewable-generated electricity to be carried on the three CapX projects.

c. Applicants sign PPAs or commit to utility-owned renewable generation projects within the timeframe of the Minnesota RES milestones, or earlier, depending on the proposed in-service dates of each segment of the three transmission lines.

d. Applicants commit to submit network (firm) transmission service requests to MISO Open Access Same Time Information System (OASIS) for the total amount of new capacity enabled by the three transmission lines to ensure full subscription of the capacity for renewable generation.

e. As necessary to comply with condition (a), Applicants designate the new renewable commitments as Network Resources pursuant to the MISO TEMT, and seek the designation as soon as permitted under the MISO rules, but no later than 10 days after the Commission approves the PPAs or commitments.

f. Applicants report to the Commission any changes at MISO or the federal level that could affect the conditions.⁵¹⁹

⁵¹⁷ Ex. 98 at 2-3 (King Rebuttal).

⁵¹⁸ Ex. 177 at 5-7 (Schedin Direct).

⁵¹⁹ Ex. 213;

449. MCEA asserted that the conditions assure that the new generation outlet is used for the purpose upon which the Applicants' need is based, supporting renewable generation outlet. Its first condition was its most important: entering into commitments at the expected level of outlet generation at least two years before the transmission lines are expected to be in service. Utilities' commitments to purchase or own renewable energy are critical to the development of those projects. Changes to the MISO interconnection process require a signed PPA or ownership by the load-serving entity to move the project through the queue. By requiring signed PPAs, MCEA believed that the transmission lines will in fact promote renewable generation. The remaining conditions would assure that the contracted or owned renewable energy projects will be interconnected and obtain transmission service in a timely manner coincident with the in-service dates of the CapX lines.⁵²⁰

450. MCEA's proposed conditions are intended to fully utilize the firm transmission capability of the new lines, but would not preclude the use of the lines by other non-renewable facilities. To the extent renewable energy is not available due to weather or other circumstances, nonrenewable energy would have access in the real-time market to the facilities.⁵²¹

451. Changes in the MISO queue process allow projects to move through the queue by achieving designated milestones. Projects that achieve the milestones can move ahead of those that do not. In the opinion of MCEA, a signed PPA or utility commitment to purchase the power is necessary to meet one of the key milestones.⁵²²

452. The Applicants, OES and MISO opposed the proposed conditions. CETF supported MCEA's proposed conditions for the Brookings Project.⁵²³ NAWO/ILSR would deny the certificate of need for the Brookings Project, but if the certificate of need is granted, it favored imposing conditions to assure that generation outlet will be used for wind energy and outweigh the adverse greenhouse gas emissions from construction activities.⁵²⁴ UCAN and NoCapX did not address the proposed conditions.

453. MCEA relied upon the Commission's order in the "825 MW Proceeding," issuing a certificate of need for four transmission lines in southwestern Minnesota, as precedent for the conditions that it is requesting in this proceeding.⁵²⁵ The Applicants and OES distinguish the 825 MW Proceeding on the basis that its sole purpose was to develop generation outlet from Buffalo Ridge and not to improve overall system reliability or address projected load growth. MCEA maintained that the distinction was not determinative because renewable generation that complies with the conditions will be available to address load-serving and system reliability, as well as assure that

⁵²⁰ T. 20 at 14 (Ellison).

⁵²¹ T. 20 at 15 (Ellison).

⁵²² T. 20 at 19-20 (Ellison).

⁵²³ CETF Posthearing Brief at 50 *et seq.*

⁵²⁴ NAWO/ILSR Posthearing Brief at 36.

⁵²⁵ Ex. 214, *In the Matter of the Application of Northern States Power Company d/b/a Xcel Energy for Certificates of Need for Four large High Voltage Transmission Line Projects in Southwestern Minnesota, "Order Granting Certificates of Need Subject to Conditions,"* E-002/CN-01-1958, 03/11/03.

generation outlet is dedicated to renewable generation. MCEA agreed that wind generation is a variable resource, and when wind energy is not fully available, there will be non-firm capacity available to other resources.⁵²⁶

454. Although the MCEA may be correct that the conditions would not impede the ability of the CapX projects to meet the claimed need, the regulatory and political climate has changed significantly since the 825 MW Proceeding.

455. There is no basis to apply the conditions to the La Crosse Project because the Applicants have not claimed that it will increase generation outlet by a specified amount, except in coordination with the as-yet-unapproved RIGO lines.

456. Although the Applicants expect an increase of 350 MW on the Fargo Project, it will serve other identified needs, including improved regional and community reliability.

457. The Brookings Project is more similar to the Southwestern Minnesota 825 MW project upon which the Commission placed conditions. However, changes in the law and in MISO diminish the importance of placing any conditions upon its certificate of need.

458. Unlike Xcel Energy's claim in the 825 MW Proceeding, in this proceeding Applicants have not claimed that the CapX lines will serve renewable generation only. Here, Applicants' asserted need is to provide access to any form of generation to meet projected load growth.⁵²⁷ OES has demonstrated that by 2020 Minnesota utilities will need 1,269 MW to 2,094 MW of non-renewable generation in addition to renewable generation. The CapX projects are a step toward serving that load growth.⁵²⁸

459. The regulatory environment has significantly changed since the Commission issued its order in the 825 MW Proceeding. Utilities are required to file IRPs demonstrating the generation resources that will be used to serve load, and the IRPs are reviewed for compliance with the recently enacted laws that include clear preferences for renewable generation and for generation that does not emit greenhouse gases. In that proceeding, the costs and benefits of resource selection are appropriately considered.

460. There are thousands of megawatts of wind generation seeking interconnection through MISO, including requests for interconnection at the substations along the Brookings Project. MCEA claimed that signed commitments are essential to get wind projects financed and constructed, but the length of the MISO queue suggests that wind development is booming as developers anticipate implementation of the states' renewable energy standards and possible carbon taxes. Regardless of whether the Applicants sign additional PPAs or commit to additional wind development, the experts testified that wind generation is the most likely form of generation to take up

⁵²⁶ Ex. 206 at 5 (Ellison Surrebuttal); Ex. 199 at 7-9 (Schedin Surrebuttal).

⁵²⁷ T. 13 at 116 (Alders).

⁵²⁸ Ex. 274 at 1-2 (Ham Surrebuttal); Ex. 275.

new generation capacity. However, the Applicants have not convincingly demonstrated that the conditions would impede competitive bidding. There are multiple developers vying for interconnection.⁵²⁹

461. MCEA raised the possibility that, without conditions that tie the CapX projects to renewable energy, the Applicants may later claim that there is insufficient transmission to meet the RES milestones. The Commission may modify or delay the RES upon review of circumstances, including “transmission constraints preventing delivery of service.”⁵³⁰

462. Minnesota transmission owners must regularly report on the transmission needed to meet the RES, which provides the Commission with the opportunity to monitor compliance, and minimizes the likelihood that the Applicants, or any Minnesota utility, can assert that there is insufficient transmission to meet the RES milestones. As previously cited, the recent report includes the Brookings Project and the Fargo Project among the transmission lines expected to support RES compliance.

463. Once the transmission lines are in place, the lowest-cost generation will be dispatched, regardless of the conditions placed on the Applicants. The integrated network system will operate in accordance with market security and economic dispatch. The conditions cannot extend to the actual operation of the transmission lines and its obligation to assure open and nondiscriminatory access.⁵³¹

464. The Applicants and OES argued that transmission decisions should be independent of generation decisions, but they have relied in part upon the RES and MISO’s lengthy list of wind generation interconnection requests as justification for the Brookings Project in particular, and the Fargo Project and La Crosse Project to a lesser extent. Nonetheless, this reliance does not logically lead to the conclusion that conditions should be placed on the CapX projects. The Applicants have a legal obligation to meet the RES, regardless of whether the CapX projects are approved or used,⁵³² and are on track to do so.⁵³³ Even if the Applicants do not use the CapX projects to meet their own RES, there is demonstrated need for greater transmission facilities to meet forecasted load growth and to address the requests for interconnection on the MISO queue.

465. The proposed conditions are not appropriate to assure that the CapX projects address the demonstrated need for regional reliability, community reliability, or increased generation outlet.

⁵²⁹ Ex. 204 at 4-5 (Ellison Direct).

⁵³⁰ Minn. Stat. § 216B.1691, subd. 2b (7).

⁵³¹ MISO Reply Brief at 5-6; T. 5B at 55 (Webb).

⁵³² See T. 20 at 107 (Ellison).

⁵³³ Ex. 54, 2007 Minnesota Biennial Transmission Projects Report, Part II (Renewable Energy Standards Report 2007) at Section 5. See *also*, Part 1 at 109 (Fargo Project), 183 (Brookings Project), 197 (La Crosse Project); Ex 231 at 26 (Peirce Direct) (Applicants in compliance with RES); T. 22 at 107 (Peirce).

C-BED Conditions

466. NAWO/ILSR proposed that the Commission condition the granting of the certificates of need on the Applicants' signing PPAs for 600 MW of dispersed C-BED projects within the next two years.⁵³⁴ CETF proposed a similar condition: that the Commission condition the granting of the certificates of need on Applicants signing at least 300 MW of dispersed C-BED projects by 2012 if viable C-BED projects are available.⁵³⁵

467. NAWO/ILSR and CETF witnesses expressed a strong preference for C-BED. In their view, small, dispersed generation, particularly locally owned generation, provides the most benefit to the communities affected by generation and transmission development, and is most compatible with "[providing] benefits to society in a manner compatible with protecting the natural resources."⁵³⁶

468. Dr. Kildegaard's testimony focused on the benefits of small, community-owned energy development, including greater local job creation and spending.⁵³⁷ He reviewed studies of the economic benefits of community based ownership and also participated in a study of data from Big Stone County on the economic impact of a locally-owned 10 MW wind project. The results of the study were consistent with the literature: community-owned wind projects have up to 5 times the economic impact on local value added and up to 3.4 times the impact on local job creation, relative to a project developed by an outside ownership group.⁵³⁸

469. Xcel Energy has announced its intention to deploy approximately 500 MW of C-BED by 2010, and has issued a request for proposal to fulfill this commitment.⁵³⁹ Whether this is the appropriate amount of C-BED is best addressed in a resource planning docket where its costs and benefits can be analyzed.⁵⁴⁰

470. The Applicants acknowledge that there is a public interest in facilitating C-BED as part of the overall effort to develop renewable energy because C-BED offers greater opportunity for revenue to go into the communities.⁵⁴¹

471. The DRG Study demonstrated that there are limited opportunities to add dispersed generation to the transmission system. The CapX projects may be able to increase the opportunity to add dispersed generation, but there is no evidence in this record of where or when those projects would be added or the cost of doing so, or whether community-based projects would or should take precedence over other forms of generation or ownership. Like the conditions proposed by MCEA, the preference to

⁵³⁴ Ex. 115 at 4 (Michaud Surrebuttal).

⁵³⁵ CETF Posthearing Brief at 76.

⁵³⁶ Minn. R. 7849.0120, subp. C (2).

⁵³⁷ Ex. 166 at 15-17 (Kildegaard Direct).

⁵³⁸ Ex. 166 at 16-17 (Kildegaard Direct); Ex. 168, Kildegaard, Myers-Kuykindall, "Community vs.

Corporate Wind: Does It Matter Who Develops the Wind in Big Stone County, Mn.?" revised, Sept. 2006.

⁵³⁹ Ex. 132 at 25 (Alders); see also, Minn. Stat. § 216B.1691, subd. 10..

⁵⁴⁰ Minn. Stat. §§ 216B.1612; 216B.1691, subd. 10; 216B.2422, subd. 2; Ex. 1 at 7.18-7.20 (Application).

⁵⁴¹ T. 13 at 107-108 (Alders).

be given to dispersed generation, and C-BED in particular, are better addressed in a resource planning docket where the relative costs and benefits can be fully examined.

Statutory Enactments That Affect the Determination of Need

472. Minnesota Statute § 216B.243, subd. 3 (10), requires the Applicants to demonstrate compliance with section 216B.2425, subdivision 7. Section 216B.2425, subdivision 7, requires utilities to determine the transmission upgrades needed to support the renewable energy standards under section 216B.1691. In their most recent biennial transmission plan, the Applicants and other utilities reported on current progress toward meeting RES and identified and discussed the transmission needed to meet the renewable energy objectives. The Fargo Project and the Brookings Project are among the lines that utilities project are needed to meet intermediate RES milestones.⁵⁴²

473. CETF contended that there is no direct connection between the CapX projects and the RES. It claimed that there were no specific identified wind projects that would interconnect to CapX and no assurance that any wind projects at all would interconnect.⁵⁴³ However, the record is clear that wind energy is the most likely to connect to the Brookings Project, and that all three projects will relieve constrained transmission to allow for greater interconnection. So long as the Applicants can demonstrate that they are in compliance with the RES, the certificate of need statute does not limit use of the transmission lines use solely to renewable energy.

474. Minnesota Statutes § 216B.243, subd. 3 (12) states that the Commission shall evaluate:

[I]f 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 association with that risk.

475. Similarly, Minn. Stat. § 216B.1694, subd. 2 (a)(5), applies to the building or construction of a fossil-fuel-fired generation facility.

476. Since the applicants are proposing transmission lines and not a nonrenewable generation plant, neither section 216B.243, subd. 3 (12), nor section 216B.1694, subd. 2 (a)(5) apply to this proceeding.

477. Minnesota Statute § 216B.243, subd. 3a, provides that the Commission may not issue a certificate of need for transmission that transmits electric power generated by a nonrenewable energy source. Section 216B.2422, subd. 4, includes a

⁵⁴² Ex. 54, 2007 Minnesota Biennial Transmission Projects Report, Part II (Renewable Energy Standards Report 2007) at Section 5. See also, Part 1 at 109 (Fargo Project), 183 (Brookings Project), 197 (La Crosse Project); Ex. 231 at 26 (Peirce Direct); Ex. 282 at 86-88 (Rakow Direct); (Applicants in compliance with RES).

⁵⁴³ CETF Posthearing Brief at 26-27.

similar preference for renewable energy. These preferences have been interpreted to apply to transmission interconnecting to a specific generation source and not to transmission that improves the overall ability of the system, without regard to type of generation.⁵⁴⁴ It is likely that the proposed CapX projects will enhance the development of renewable energy, but they are not intended to connect to any one generation source or type.

Minnesota Greenhouse Gas Emissions

478. In 2007, the Legislature enacted restrictions on greenhouse gas emissions. The law states, in part, that no party may import from outside the state power from a new large energy facility that would contribute to statewide power sector carbon dioxide emissions,⁵⁴⁵ and it set goals for reduction of greenhouse gases.⁵⁴⁶ NAWO/ILSR and CETF asserted that the CapX projects are inconsistent with the greenhouse gas emissions controls enacted in Minnesota and under discussion in other states.⁵⁴⁷

479. The CapX projects will not connect to a particular generator. In their IRP filings, the Applicants must specify their anticipated generation sources, and the Commission will have the opportunity to assess compliance with this statute.⁵⁴⁸ Also, because of the current regulatory climate, as Dr. Rakow stated in his testimony, “the only generation it is reasonable to assume will be interconnected and delivered by the proposed transmission lines is generation that does not emit CO₂.”⁵⁴⁹

480. The incremental impact of the proposed projects will be significant reduction in line losses and the associated pollution, including greenhouse gases.

Evidentiary Support for the Findings of Fact

481. Citations to the transcripts or hearing exhibits in these Findings of Fact are not inclusive of all applicable evidentiary support in the record.

Based on these Findings of Fact, the Administrative Law Judge makes the following:

⁵⁴⁴ Ex. 27, *In the Matter of the Application of Otter Tail Power Company for a Certificate of Need for Appleton-Canby 115 kV High Voltage Transmission Line*, Order Granting Certificate of Need, Docket No. E-017/CN-06-677 at 9 (April 18, 2007).

⁵⁴⁵ Minn. Stat. § 216H.03, subd. 3.

⁵⁴⁶ Minn. Stat. § 216H.02, subd. 1.

⁵⁴⁷ NAWO/ILSR Posthearing Brief at 19-20.

⁵⁴⁸ See Minn. Stat. § 216H.06.

⁵⁴⁹ Ex. 303 at 30-31 (Rakow Rebuttal).

CONCLUSIONS

1. The Public Utilities Commission (“Commission”) and the Administrative Law Judge have jurisdiction to consider the Applicant’s Application for certificates of need for the La Crosse, Fargo and Brookings Projects.⁵⁵⁰

2. The La Crosse, Fargo and Brookings Projects each meet the definition of “large energy facility” and require a certificate of need from the Commission prior to construction.⁵⁵¹

3. The Commission issued an Order Accepting the Certificate of Need Application as Substantially Complete, Contingent on Submission of Additional Data, on November 21, 2007.

4. Public hearings were held at places and times convenient to the public, and public testimony was taken at the public hearings, and through written comments.⁵⁵² Public hearings were completed on July 2, 2008; the evidentiary hearing was completed on September 18, 2008.⁵⁵³ The Applicants’ notice of the hearings complied with statute and rule. A Commission staff member was present at each hearing to facilitate public participation.⁵⁵⁴

5. Applicants have complied with all applicable procedural requirements for a Certificate of Need.

6. The criteria for evaluating the application for certificates of need are set forth in statute and rule.⁵⁵⁵ Application of the criteria includes a determination of need and, based on the evidence in the record, whether there is a more reasonable and prudent alternative to address that need.⁵⁵⁶

7. Applicants bear the burden of proving the need for a proposed transmission line and demonstrating that the statutory criteria have been met.⁵⁵⁷

8. Applicants have demonstrated that there is a need for the La Crosse Project as proposed, for the Fargo Upsized Alternative, and for the Brookings Upsized Alternative. Each of the projects will address three needs: regional reliability, community reliability, and increased generation outlet.

9. No more reasonable and prudent alternative has been demonstrated to address those needs.

⁵⁵⁰ Minn. Stat. §§ 216B.243 and 14.50.

⁵⁵¹ Minn. Stat. §§ 216B.243 and 216B.2421, subd. 2 (3).

⁵⁵² Minn. Stat. § 216B.243, subd. 4.

⁵⁵³ Minn. R. 7829.1100; Minn. R. 7829.2500, subd. 9.

⁵⁵⁴ Minn. Stat. § 216B.243, subd. 4; Notice and Order for Hearing, Nov. 21, 2007.

⁵⁵⁵ Minn. Stat. § 216B.243, subd. 3; Minn. R. 7849.0120.

⁵⁵⁶ See, e.g. Minn. R. 7849.0120 B.

⁵⁵⁷ Minn. Stat. § 216B.243, subd. 3.

10. The La Crosse Project as proposed, outlined on Attachments C and D, has two configurations. Selection should be subject to a determination in the routing proceeding of the most appropriate river crossing and substation termination.

11. The in-service date for the Northern Hills-North Rochester 161 kV line shall be the third quarter of 2011, subject to modification in the course of proceedings addressing the certificates of need for the RIGO projects.

12. Applicants have demonstrated the need for the North Rochester-Chester 161 kV line or, in the alternative, a direct connection of the 345 kV line at the Chester Substation, if dictated by selection of the Southern Crossing in the routing proceeding.

13. The Fargo Upsized Alternative, as outlined on Attachment A, is the best configuration, subject to a determination in the routing proceeding of the most appropriate northwestern termination.

14. The Brookings Upsized Alternative, as outlined on Attachment B, is the best configuration, subject to confirmation of the most appropriate eastern termination.

15. The Commission must fully examine the option of generating power by means of renewable energy sources, including hydro, wind, solar, and geothermal energy and the use of trees or other vegetation as fuel.⁵⁵⁸ The proposed transmission lines are likely to carry electric power generated by both renewable and nonrenewable energy sources. The Applicants have demonstrated that the transmission lines cannot be replaced by renewable energy sources.

16. Applicants must show that a renewable energy facility is not in the public interest. Applicants have shown that renewable energy facilities cannot meet the demonstrated need for additional transmission to provide regional and community reliability and increased generation outlet capacity.⁵⁵⁹ Applicants have demonstrated that granting the certificates of need for CapX is in the public interest and has a high probability of promoting increased renewable energy generation.

17. The Environmental Report was filed as required, its contents met the criteria set forth in rule, and it complied with the Scoping Order.⁵⁶⁰ Each corridor has at least one feasible route with feasible river crossings that, with proper mitigation, will not significantly degrade the natural environment. The CapX projects will have a substantial impact on the natural environment. Routing and construction should be conducted to avoid harmful effects and, where damage is unavoidable, to significantly mitigate the impact.

⁵⁵⁸ Minn. Stat. § 216B.243, subd. 3a.

⁵⁵⁹ See Minn. Stat. §216B.2422, subd. 4.

⁵⁶⁰ Minn. R. 7849.7060, subps. 1, and 3; Minn. R. 7849.7090.

18. Applicants have demonstrated that they are in compliance with the RES set forth in Minn. Stat. § 216B.1691.⁵⁶¹

19. Applicants have satisfied other relevant statutory criteria set forth in Minn. Stat. § 216B.2422, subd. 4 (renewable energy preference), Minn. Stat. § 216B.2426 (distributed generation), Minn. Stat. § 216B.1612 (C-BED), and Minn. Stat. § 216H.03 (greenhouse gas emissions).

20. Applicants shall provide a compliance filing, informing the Commission and other interested parties of the final ownership interest of all sponsoring utilities, once ownership arrangements have been finalized.

21. Applicants shall take those actions necessary to implement the Commission's orders in this proceeding.

22. Any of the Findings of Fact more properly designated Conclusions are hereby adopted as such.

Based upon these Conclusions, and for the reasons explained in the accompanying Memorandum, the Administrative Law Judge makes the following:

RECOMMENDATIONS

1. That the Commission approve the La Crosse Project as proposed, subject to the following:

- a. The final decision concerning the location of the Mississippi River crossing and the termination point near La Crosse shall be made in the routing proceeding;
- b. Approve the third quarter of 2011 as the in-service date for the Northern Hills-North Rochester 161 kV line, subject to modification in the course of proceedings addressing the certificates of need for the RIGO projects; and
- c. Approve the North Rochester-Chester 161 kV line or, in the alternative, a direct connection of the 345 kV line at the Chester Substation, if dictated by selection of the Southern Crossing in the routing proceeding.

2. That the Commission approve the Fargo Upsized Alternative, subject to the following: The decision whether the northwestern termination should be at the Maple River Substation or at a new substation near Fargo, North Dakota, shall be determined in the routing proceeding, with due regard for the authority of the North Dakota Public Service Commission.

⁵⁶¹ See Ex. 54; Ex. 231 at 26 (Peirce Direct); Ex. 282 at 86-88 (Rakow Direct).

3. That the Commission approve the Brookings Upsized Alternative, subject to the following: The decision whether the eastern termination should be at the Lake Marion Substation or the Hampton Corners Substation cannot be made on this record. The Commission may request that the Applicants explain why the new substation was included in the supporting studies, and its benefits to regional reliability, community load serving, and generation outlet.

Dated: February 27, 2009

s/Beverly Jones Heydinger

BEVERLY JONES HEYDINGER
Administrative Law Judge

Reported: Transcripts Prepared

NOTICE

Notice is hereby given that, pursuant to Minn. Stat. § 14.61, and the Rules of Practice of the Minnesota Public Utilities Commission (“Commission”) and the Office of Administrative Hearings, exceptions to this Report, if any, by any party adversely affected must be filed according to the schedule which the Commission will announce. Exceptions must be specific and stated and numbered separately. Proposed Findings of Fact, Conclusions and Order should be included, and copies thereof shall be served upon all parties. Oral argument before a majority of the Commission will be permitted to all parties adversely affected by the Administrative Law Judge’s recommendation who request such argument. Such request must accompany the filed exceptions or reply (if any), and an original and 15 copies of each document should be filed with the Commission.

The Commission will make the final determination of the matter after the expiration of the period for filing exceptions as set forth above, or after oral argument, if such is requested and had in the matter.

Further notice is hereby given that the Commission may, at its own discretion, accept or reject the Administrative Law Judge’s recommendation and that the recommendation has no legal effect unless expressly adopted by the Commission as its final order.

MEMORANDUM

The Applicants have proposed an ambitious project to upgrade the transmission system so that it will serve the state for many years. Many of the benefits of the proposed projects are dependent on future development. Although this makes the Application more difficult to evaluate and vulnerable to criticism, it is also one of its

strengths. New transmission lines stretching for miles across the open land will have a negative impact on the environment.⁵⁶² Thus, it is essential to determine if there is a demonstrated need for the transmission lines, and if there is, to evaluate any reasonable, prudent alternative.

The Applicants have demonstrated that the CapX projects meet three needs: to improve the regional reliability of the transmission system, to improve community reliability in specified communities, and to increase generation outlet. For regional reliability, all of the documented load forecasts demonstrate that the need for reliable electricity will continue to grow through 2020. Although the economy is currently in recession, the modeling took into account a “slow-growth” forecast that was approximately 30 percent lower than the expected growth. This is a substantial reduction. Also, OES recalculated the forecasted load, taking into account the newly enacted conservation standards. Its analysis showed that the estimated 2009 load that served as the basis for earlier projections was low, but also used other forecast methods to verify that the load levels included in the Applicants’ models were well-supported. Thus, even with slowed growth in demand, the level of load used in the transmission studies was amply justified.

For their estimates of community reliability, the Applicants reduced the forecasted growth rate below historical levels. Its analysis showed that the load in the identified communities would exceed the level at which the system could provide reliable service by about 2011. OES also verified the community load projections.

NAWO/ILSR and CETF asserted that the community needs could be met by greater conservation and demand management. However, they could provide no experience-based data that supported a revised load forecast. They also claimed that local generation or dispersed generation could reliably service local needs. But they failed to offer concrete evidence of the location, size, and cost for such projects and whether additional transmission would be needed to add new generation to the system. Moreover, the DRG Study, rather than supporting the claim that dispersed generation is a viable substitute, demonstrated that there are limited opportunities to add dispersed generation to the transmission system. To do so, the study removed generation from the system and found that there were significant areas where siting dispersed generation was very difficult. Those areas included wind-rich portions of western Minnesota.

MCEA, NAWO/ILSR, NoCapX, UCAN and CETF support the public policy of shifting to renewable forms of energy, and specifically support further development of wind power. Their contention is that the CapX projects may support non-renewable generation rather than bolster the shift to renewable resources. However, federal law requires open access to transmission lines, and neither the Applicants nor MISO can guarantee that only renewable forms of energy will have access to the CapX projects. The Applicants and MISO are obliged to maintain an adequate supply of transmission

⁵⁶² *Accord, People for Environmental Enlightenment and Responsibility (PEER) v. Environmental Quality Council*, 266 N.W.2d 858,867 (Minn. 1978).

capacity to serve generators requesting transmission service and to assure reliable, secure service to customers. It takes several years to study, plan, seek approval, and construct new transmission lines. By placing large transmission lines into areas where new generation is likely, the Applicants will strengthen the backbone of the transmission system and support new interconnection. In this case, the number of wind projects on the MISO queue is ample evidence of potential renewable generation in the area that the CapX projects will serve.

Although there are no guarantees that only renewable generation will be added to the system, there are a number of legislative mandates that increase the likelihood that the greatest portion of the new additions will be renewable generation. The Applicants, MISO and OES all predicted that renewable generation will take most, if not all, of the capacity added by the CapX projects because of the RES and limitations on carbon emissions.

Policies promoting conservation and renewable energy are within the purview of the legislature and subject to the Commission's oversight. Those bodies are best suited to evaluate the full picture of costs, benefits, and overall compliance. A certificate of need proceeding for transmission lines with no direct connection to a specific generator is not the appropriate forum in which to weigh the larger societal costs and benefits of the shift away from fossil fuels toward renewable energy. The Applicants and OES applied the conservation and renewable energy standards that are currently in place and guide Minnesota resource planning. Holding the Applicants to standards that exceed those set by the Legislature is not warranted in a certificate of need proceeding.

The Applicants have demonstrated that the need for the Fargo Upsized Alternative and Brookings Upsized Alternative is near-term, from the perspective of transmission planners. Planning is well underway to upgrade the major limiter to increasing capacity on both of these projects, the Minnesota Valley-Blue Lake 230 kV line. The application for a certificate of need to upgrade it is imminent, and perhaps already initiated. The Applicants' revised proposal to upgrade the Lyon County-Minnesota Valley line as part of the Brookings Project reflects this probability. OES estimated that the amount of new generation needed to meet the RES exceeds 3000 MW. The Upsized Alternative for the Brookings and Fargo Projects provides a cost-effective alternative for gaining access to the wind-rich portions of Minnesota, North Dakota and South Dakota.

In contrast, there was no compelling evidence to support the Upsized Alternative for the La Crosse Project. Although there were general statements that constructing larger structures is common-place in some parts of the country, and at some point a second circuit could provide greater access to the east and south or back up renewable energy, there was no specific evidence of any projects under consideration that would benefit from the Upsized Alternative, or transmission constraints beyond those that would be addressed by the La Crosse Project as proposed and the RIGO lines. In fact, the record was clear that the La Crosse Project as proposed would serve community needs, enhance regional reliability, and support renewable generation well past 2020.

Because of the rapid pace of change in policies to reduce use of fossil fuels, to develop more demand-side management with Smart Grid and other innovations, and to promote more dispersed generation and community-based energy development, it is very difficult to predict whether the Upsized Alternative for the La Crosse Project will be required to meet need beyond 2020.

Nonetheless, there may be significant environmental benefits to constructing larger towers in some locations. During the siting, the quantity of power transfer and type of transmission lines may not be reconsidered, but the relative costs and benefits of installing larger structures in selected locations can be evaluated.

Some of the parties and members of the public are certain that the proposed projects, and especially the Upsized Alternative, are a subterfuge to speed development of transfer of power from the western states of North and South Dakota to load in Wisconsin and points further to the west. The record does not support this fear. Each of the planning engineers credibly testified that the lines are intended to strengthen regional reliability to serve Minnesota load by providing alternative paths to the metropolitan area and the identified communities, reducing current congestion, and helping Minnesota meet its renewable energy goals.

CETF, NAWO/ILSR and NoCapX were critical of contingency planning that addressed the loss of a second facility, either a generator or a transmission line. However, the NERC standards require the planners to identify the problems created by a second outage and prepare back-up for that second contingency. There was no basis to conclude that such planning was unnecessary or excessive.

It is inevitable in a proceeding of this size and complexity that some points are not fully addressed to the satisfaction of the Administrative Law Judge. One of those was raised by CETF. The underlying studies that led to the development of the Brookings Project included the new Hampton Corners Substation as the eastern endpoint. However, review of the record identified no explanation for extending the project from the Lake Marion Substation to Hampton Corners. In order to assure that the additional miles of transmission line are fully explained, the Commission may ask the Applicants to provide a basis for including the new substation in the studies and its benefits to regional reliability, community load serving and generation outlet.

Although the positions taken in this proceeding by MCEA, NAWO/ILSR and CETF did not ultimately prevail, their importance to the proceeding cannot be overstated. Each of them carefully analyzed the Application and its supporting documents. Each of them asked for explanations and clarification that improved the quality of the record, pointed out errors and inconsistencies, and enhanced the deliberation. They served the public well by contributing to a more transparent, open process. Their involvement required significant investment of both time and money and, unlike in utility rate proceedings, they participated without the possibility of

reimbursement.⁵⁶³ They are commended for their commitment to serving the public interest.

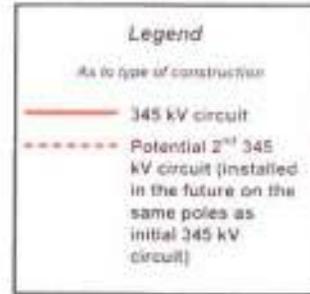
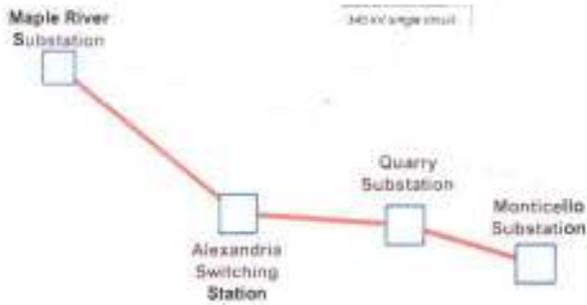
B. J. H.

⁵⁶³ See Minn. Stat. § 216B.16, subd. 10.

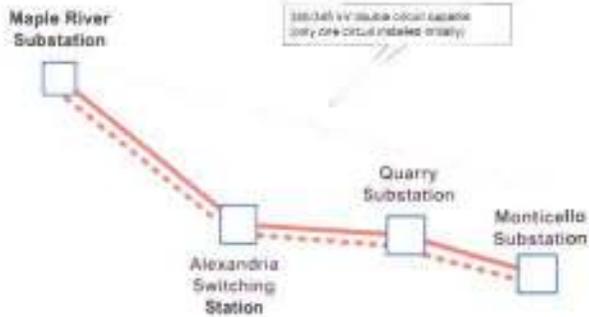
CapX2020: Twin Cities – Fargo 345 kV Project

Docket No. E-002/CN-06-1115
OAH Docket No. 15-2500-19350-2
ATTACHMENT A

Application Proposal



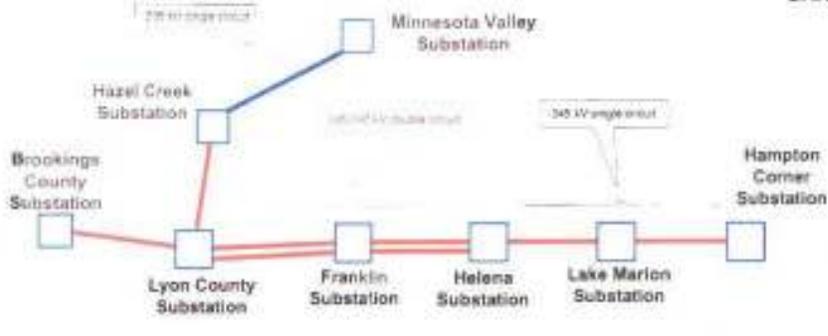
Upsizing Alternative



CapX2020: Twin Cities – Brookings County 345 kV Project

Application Proposal

Docket No. E-002/CN-06-1115
 OAH Docket No. 15-2500-19350-2
 ATTACHMENT B



Legend

As to type of construction

- 345 kV circuit
- - - Potential 2nd 345 kV circuit (installed in the future on the same poles as initial 345 kV circuit)

Upsizing Alternative

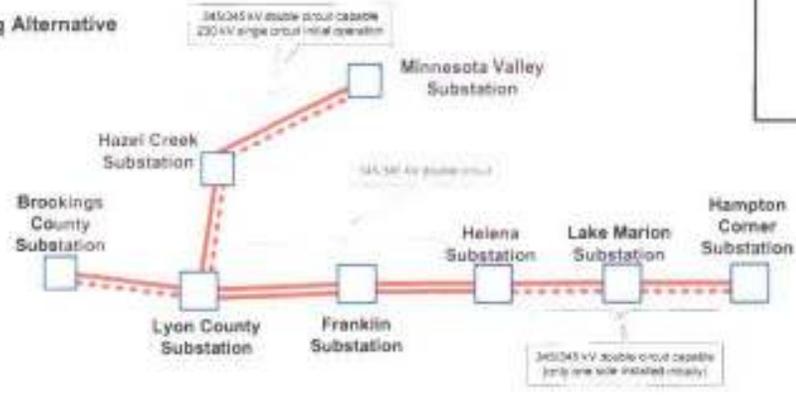
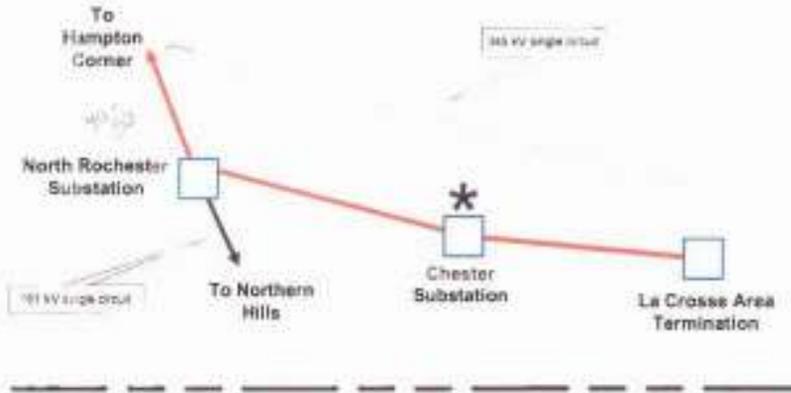


EXHIBIT
 23

CapX2020: Twin Cities – La Crosse 345 kV Project – Southern Crossing

Application Configuration (as amended in Stevenson direct testimony)

Docket No. E-002/CN-06-1115
 OAH Docket No. 15-2500-19350-2
 ATTACHMENT C



Legend

- As to type of construction
- 345 kV circuit
- - - - - Potential 2nd 345 kV circuit (installed in the future on the same poles as initial 345 kV circuit)
- 161 kV circuit
- Existing 161 kV lines
- *** Per Stevenson Direct: Routing 345 kV line through Chester Substation could eliminate 161 kV line from North Rochester to Chester

Upsizing Alternative

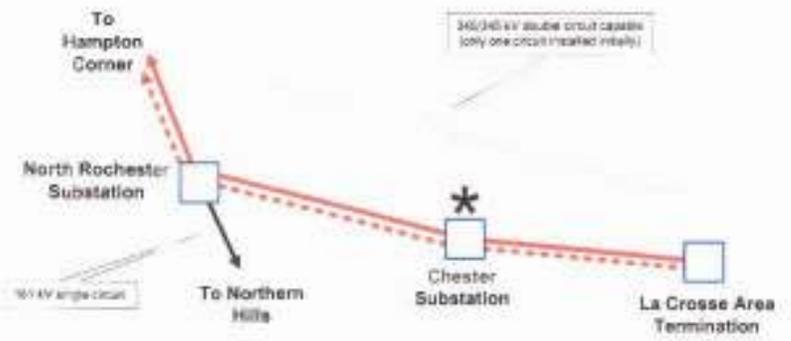


EXHIBIT
 24

Revised Figure 6-6*, Load Growth Forecasts

PUC Docket No. E002/CN-06-1115
 OAH Docket No. 15-2500-19350-2
 Attachment E

Forecast Source	Citation	Forecast Scenario	Load Forecast (MW)		Load Growth by 2020 (MW)
			2009	2020	
CapX2020 Vision Plan	Ex. 6 at 15 (Rogelstad Direct)	Expected Growth	20,201	26,488	6,287
	Ex. 48 at 8-9 (Lacey Direct)	Slow Growth**	20,201	24,701	4,500
MAPP Load and Capability	Application Figure 6-6	System Demand	20,783	25,969	5,186
Integrated Resource Plans	Ex. 48 at 8 (Lacey Direct)	High	22,488	27,392	4,904
		Median	21,332	25,427	4,095
IRP per NAWO IR No. 7*** (Ex. 51)	Ex. 140 at 4 (Michaud Direct)	High	22,938	27,708	4,789
		Medium	21,789	25,708	3,919
OES Analysis	Ex. 257 at 15 (Ham Direct)	Base Case	22,228	27,060	4,832 ⁺
	Ex. 247 at 4 (Peirce Surrebuttal); Ex. 215 at 12-13 (Davis Direct)	Revised w/1.0% DSM		26,357	4,129
		Revised w/1.5% DSM		25,690	3,462
	Ex. 274 at 2 (Ham Surrebuttall)	Revised w/new generation to meet RES			4,621-6,817 ¹

* Revised version of Ex. 53.

** This is a planning assumption of 30% lower than the expected growth level. Ex. 48 at 5 (Lacey Direct).

*** Based on Lacey’s response to NAWO IR No. 7 (Ex. 51) – taking into account the three new IRPs that also include consideration of the 1.5% conservation statute. Dairyland’s IRP appears not to have taken the 1.5% conservation statute into consideration.

+ Mr. Ham assessed the need for 4,688 – 6,880 MW of new generation by 2020 to meet overall customer usage by 2020, including 1,349 – 2,173 MW of non-renewable energy generation and 3,148 – 4,911 of new wind to meet state RES. Ex. 231 at 21 (Peirce Direct).

¹ Mr. Ham revised the OES forecast of additional generation. Includes 1,269-2,094 of non-renewable and 3,160-4,927 of renewable generation. Ex. 275.

ESTIMATED PROJECT COST

PUC Docket No. E002/CN-06-115
 OAH Docket No. 15-2500-19350-2
 Attachment F

PROJECT	APPROXIMATE COST, In Millions, as Proposed	APPROXIMATE COST, In Millions, Upsized Alternative
La Crosse Project ⁵⁶⁴	\$364 - \$374 (Alma Crossing) \$355 - \$363 (Southern Crossing)	\$389 - \$415 (Alma Crossing) \$407 - \$432 (Southern Crossing)
Fargo Project ⁵⁶⁵	\$390 - \$560	\$500 - \$640
Brookings Project ⁵⁶⁶	\$603.7 - \$669.6	\$654 - \$725
Underlying System Improvements ⁵⁶⁷	\$70 - \$100	\$70 - \$100

⁵⁶⁴ Ex. 89 at 4 (Stevenson Surrebuttal).

⁵⁶⁵ Ex. 83 at 16 (Stevenson Direct); Ex. 88 at 5 (Stevenson Rebuttal), Excludes new Fargo-area substation cost of approximately \$20 million; Ex. 312 (Kline Final Rebuttal).

⁵⁶⁶ Ex. 116 at 9 (Lennon Direct); Ex. 120 at 4-5 (Lennon Rebuttal).

⁵⁶⁷ Ex. 1 at 2.17 (Application).



MINNESOTA OFFICE OF ADMINISTRATIVE HEARINGS

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February 27, 2009

Dr. Burl W. Haar, Executive Secretary
MN Public Utilities Commission
350 Metro Square Building
121 Seventh Place East
St. Paul, MN 55101

Re: ***In the Matter of the Application of Great River Energy,
Northern States Power Company (d/b/a Xcel Energy) and
others for Certificates of Need for the Cap X 345-kV
Transmission Projects; PUC Docket No. CN-06-1115;
OAH Docket No. 15-2500-19350-2***

Dear Dr. Haar:

Enclosed herewith and served upon you by mail is the Administrative Law Judge's Findings of Fact, Conclusions, and Recommendations in the above-entitled matter. This document has been filed with the E-Docket system and served as specified on the attached service list and copy of email. The official record will be sent to you under separate cover.

Sincerely,

s/Beverly Jones Heydinger
BEVERLY JONES HEYDINGER
Administrative Law Judge

Telephone: (651) 361-7838

BJH:nh

Enclosure

Cc
To All Individuals on the Attached Service List

In the Matter of the Application of Great River Energy, Northern States Power Company (d/b/a/ Xcel Energy) and others for Certificates of Need for the Cap X 345-kV Transmission Projects

PUC Docket No. CN-06-1115

OAH Docket No. 15-2500-19350-2

OAH Service List as of August 18, 2008

All Parties have agreed to E-File documents at: www.edockets.state.mn.us. Filing with edockets shall constitute service on the Public Utilities Commission, the Department of Commerce and the Office of Administrative Hearings.

As of this date, all parties have agreed to accept service by e-mail at the e-mail addresses listed. However, where indicated, parties have requested that the e-mail be followed by mail or delivery of a hard copy.

In the event that a pleading or attachment cannot be filed and served electronically, it must be filed and served on each of the parties at the addresses listed.

Documents that contain trade secret or nonpublic data may be e-filed, but may not be copied or served electronically.

<p>Burl W. Haar (E-file or 15 copies) Minnesota Public Utilities Commission 350 Metro Square Building 121 Seventh Place East St. Paul, MN 55101-2147 Fax: 651-297-7073</p>	<p>Beverly Jones Heydinger (E-file or Original, plus e-mail and one hard copy, excluding IR Responses)* Office of Administrative Hearings 600 North Robert Street PO Box 64620 St. Paul, MN 55164-0620 Tele: 651-361-7838</p>
<p>Sharon Ferguson (E-file or 4 copies): Minnesota Department of Commerce 85 Seventh Place East, Suite 500 St. Paul, MN 55101 Tele: 651-297-3652</p>	<p>Julia Anderson Assistant Attorney General 445 Minnesota Street, Suite 1500 St. Paul, MN 55101 Tele: 651-296-8703</p>
<p>Michael C. Krikava, Lisa M. Agrimonti and Catherine A. Biestek Attorneys at Law Briggs and Morgan, PA 80 South Eighth Street 2200 IDS Center Minneapolis, MN 55402</p>	<p>Priti R. Patel Assistant General Counsel Northern States Power Company 414 Nicollet Mall Minneapolis, MN 55401</p>

<p>Keith L. Beall Senior Attorney – State Regulatory Midwest ISO Legal Department PO Box 4202 Carmel, IN 46082 Tele: 317-249-5400</p>	<p>George Crocker, Executive Director PO Box 174 Lake Elmo, MN 55042 Tele: 651-770-3861</p>
<p>Russell Martin United Citizens Action Network 11600 East 270th Street Elko, MN 55020 Tele: 952-461-3352</p>	<p>Elizabeth Goodpaster, Staff Attorney Mary W. Marrow, Staff Attorney Minnesota Center for Environmental Advocacy 26 East Exchange Street, Suite 206 St. Paul, MN 55101 Tele: 651-223-5969</p>
<p>Carol Overland Attorney at Law Overland Law Office PO Box 176 Red Wing, MN 55066</p>	<p>Paula Goodman Maccabee Just Change Consulting 1961 Selby Avenue Saint Paul, MN 55104 Tele: 651-646-8890 (office) 651-775-7128 (cell)</p>
<p>Christopher K. Sandberg Lockridge Grindal Nauen Suite 2200 100 Washington Avenue South Minneapolis, MN 55401 Tele: 612-339-6900 Fax: 612-339-0981</p>	
<p>Courtesy copy: David Aafedt and John Knapp Attorneys at Law Winthrop & Weinstine, PA 225 South Sixth Street, Suite 3500 Minneapolis, MN 55402-4629 Tele: 612-604-6400</p>	<p>Courtesy Copy (excluding IR's and IR responses): Robert Cupit (One hard copy)* David Jacobson, Bret Eknes, Mike Kaluzniak, and Tricia DeBleeckere Minn. Public Utilities Commission 350 Metro Square Building 121 Seventh Place East St. Paul, MN 55101-2147 Tele: 651-201-2255 Fax: 651-297-7073</p>

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<p>Courtesy Copy: Mike Michaud Matrix Energy Solutions N802 240th St. Maiden Rock, WI 54750</p>	<p>Courtesy Copy: John Bailey Institute for Local Self Reliance 1313 5th St. SE Minneapolis, MN 55414</p>
<p>Courtesy Copy (e-mail only): Christy Brusven Fredrikson & Byron, P.A. 200 South Sixth Street, Suite 4000 Minneapolis, MN 55402-1425 Tele: 612-492-7412</p>	<p>Courtesy copy by e-mail (IR's and IR Responses only): Larry L. Schedin PE LLS Resources, LLC 12 South Sixth Street, Suite 1137 Minneapolis, MN 55402 Tele: 651-223-5969 Fax: 651-223-5967</p>
<p>Courtesy copy (e-mail only): SaGonna Thompson Xcel Energy Government & Regulatory Affairs 414 Nicollet Mall, 7th Floor Minneapolis, MN 55401-1993</p>	<p>Courtesy copy (e-mail only): Beverly Topp 26045 Ipava Avenue W Lakeville, MN 55044</p>
<p>Courtesy copy (e-mail only) Atina Diffley Organic FarmingWorks Consulting 25498 Highview Avenue Farmington, MN 55024</p>	<p>Courtesy copy (e-mail only): Philip Mahowald, General Counsel and Peter Jones, Assistant General Counsel 5636 Sturgeon Lake Road Welch, MN 55089 Tele: 651-267-4006</p>
<p>*If there is a trade-secret version and a public version of the same document, only hard copies of the trade-secret version must be provided.</p>	

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STATE OF MINNESOTA
OFFICE OF ADMINISTRATIVE HEARINGS
ADMINISTRATIVE LAW SECTION
600 NORTH ROBERT STREET
ST. PAUL, MN 55101

CERTIFICATE OF SERVICE

Case Title: <i>In the Matter of the Application of Great River Energy, Northern States Power Company (d/b/a Xcel Energy) and Others for Certificates of Need for the Cap X 345-kV Transmission Projects</i>	OAH Docket No. 15-2500-19350-2 PUC Docket No. CN-06-1115
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Nancy J. Hansen certifies that on the 27th day of February, 2009, she served a true and correct copy of the attached Findings of Fact, Conclusions, and Recommendations by filing it on the E-Docket system, by emailing a notice that the attached Findings of Fact, Conclusions, and Recommendations is too large to email and the parties can locate it on the E-Docket system and on the Office of Administrative Hearings webpage, and by U.S. mail as listed on the attached Service List

To All Individuals on the Attached Service List