

BEFORE THE MINNESOTA OFFICE OF ADMINISTRATIVE HEARINGS  
600 North Robert Street  
St. Paul, MN 55101

FOR THE MINNESOTA PUBLIC UTILITIES COMMISSION  
121 Seventh Place East, Suite 350  
St Paul, MN 55101-2147

IN THE MATTER OF THE PETITION  
FOR CERTIFICATES OF NEED FOR  
THREE 345 kV TRANSMISSION LINE  
PROJECTS WITH ASSOCIATED  
SYSTEM CONNECTIONS

Docket No. ET2,E002 et al./CN-06-1115

**DIRECT TESTIMONY OF CHRISTOPHER J. SHAW**  
**ON BEHALF**  
**OF THE MINNESOTA OFFICE OF ENERGY SECURITY**

**MAY 23, 2008**

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IN THE MATTER OF APPLICATION FOR CERTIFICATES OF NEED FOR THREE 345 KV  
TRANSMISSION LINE PROJECTS WITH ASSOCIATED SYSTEM CONNECTIONS

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1     **I.     INTRODUCTION**

2  
3     **Q.     What is your name, business address, and occupation?**

4  
5     A.     My name is Christopher J. Shaw. My business address is 85 Seventh Place East, Suite  
6           500, St. Paul, Minnesota 55101-2198. I am employed as a Public Utilities Rates Analyst  
7           with the Minnesota Office of Energy Security (OES).

8  
9     **Q.     What is your education and professional background?**

10    A.     My resume is attached as OES Exhibit No. \_\_\_\_ (CJS-1).

11  
12    **II.    PURPOSE OF TESTIMONY**

13    **Q.     What is the purpose of your testimony?**

14  
15    A.     I am sponsoring the OES's analysis and testimony regarding the existing and planned  
16           supply of electricity as of 2009 for each utility system used by the Applicants in  
17           determining their claimed need for the proposed transmission lines. The Applicants,  
18           which are Northern States Power d/b/a Xcel Energy and Great River Energy, provided  
19           this information in response to OES Information Request (IR) 39 which I included as  
20           OES Exhibit No. \_\_\_\_ (CJS-2). The utility systems, as provided by the Applicants, are:

- 21           • Dairyland Power Cooperative (Dairyland)  
22           • Great River Energy (GRE)  
23           • Minnesota Power (MP)  
24           • Otter Tail Power Company (OTP)  
25           • Rochester Public Utilities (RPU)  
26           • Minnkota Power Cooperative (MPC)  
27           • Central Minnesota Municipal Power Agency (CMMPA)  
28           • Wisconsin Public Power, Inc. (WPPI)  
29           • Missouri River Energy Services (MRES)  
30           • Southern Minnesota Municipal Power Agency (SMMPA)  
31           • Xcel Energy (Xcel)  
32           • Hutchinson Utilities Commission (HUC)

- New Ulm Public Utilities Commission (New Ulm)
- Willmar Municipal Utilities (Willmar)
- Minnesota Municipal Power Agency (MMPA)
- Interstate Power and Light Company (IPL)

I will refer to these 16 utility systems as the “Utilities” or individually as “utility system” throughout the remainder of my testimony. I am not making any recommendations regarding the demand forecast, demand side management and energy conservation, compliance with Minn. Stat. §216B.1691, the Renewable Energy Standard, or alternatives to the proposed project. OES witness, Mr. Hwikwon Ham provides testimony on the forecasting methodology used to develop the total generation and capacity estimates, and Mr. Christopher T. Davis provides testimony on demand side management savings. Ms. Susan Peirce provide testimony regarding Minn. Stat. §216B.1691, the Renewable Energy Standard. Dr. Steve Rakow evaluates alternatives to the proposed transmission lines.

My testimony focuses solely on the existing and planned supply of electricity for the 16 utility systems listed above. This data will be used as an input by Mr. Ham.

### **III. EXISTING SUPPLY CAPACITY**

**Q. How did you analyze the existing supply capacity of each of the utility systems used to determine the need for the proposed lines?**

A. In OES Information Request 39, which, as stated above, is included as OES Exhibit No. \_\_\_\_ (CJS-2), I requested that the Applicants provide an inventory of all existing generation resources for the Utilities. In addition, I requested any expected additions and retirements of supply side resources as well as each Utility’s purchases and sales of generation capacity. To ensure a complete and accurate list, I compared the generation

resources, planned additions and retirements, and capacity purchases and sales listed in the response to OES Information Request 39 to the generation resources, planned additions and retirements, and capacity purchases and sales listed in the May 1, 2007 Mid-Continent Area Power Pool (MAPP) Load and Capability Report<sup>1</sup>, with the exception of Interstate Power Company (IPL). IPL is not a member of MAPP, so data regarding IPL's existing supply capacity is not included in the MAPP Load and Capability Report. For IPL, I compared the supply capacity data in the Response to OES Information Request 39 to the data found in IPL's most recent (2005) Integrated Resource Plan in Docket No. E001/RP-05-2029.

**Q. What is the Mid-Continent Area Power Pool (MAPP)?**

A. Article 1 of the Restated Mid-Continent Area Power Pool Agreement<sup>2</sup> states:

MAPP was established to operate as a regional reliability council and power pool to realize and further the reliability and other benefits of interconnected operations among a large number of entities engaged in the electric utility business in the MAPP Region. MAPP now functions to provide a reserve sharing pool and a regional transmission group. The regional transmission group provides for the comparable and efficient provision of transmission service on a consistent basis, to realize and further the benefits of coordinated regional transmission planning, and to resolve disputes over the provision of transmission services.

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<sup>1</sup> The May 1, 2007 MAPP Load and Capability Report may be accessed at <http://www.mapp.org/assets/pdf/2007%20MAPP%20LC%20Report%20FINAL.pdf>.

<sup>2</sup> The MAPP Restated Mid-Continent Area Power Pool Agreement may be accessed at [http://www.mapp.org/assets/pdf/Restated%20Agreement%20Amendments/Restated%20Agreement%20\(Oct%202006\).pdf](http://www.mapp.org/assets/pdf/Restated%20Agreement%20Amendments/Restated%20Agreement%20(Oct%202006).pdf).

1     **Q.   What is the MAPP Load and Capability Report?**

2     A.   Section 4.2.1.1 of the MAPP Generation Reserve Sharing Pool Handbook (GRSP)<sup>3</sup>,  
3         which sets the Load and Capability Forecast Reporting Requirements, states:

4                 At least once per year the GRSP Members shall submit to  
5                 MAPPCOR staff a ten-year forecast of seasonal load and  
6                 capability and a two-year forecast of monthly load and  
7                 capability, at a time and in a manner determined by  
8                 MAPPCOR staff. The submittals shall be in accordance  
9                 with the MRO [Midwest Reliability Organization] Load and  
10                Capability Reporting Instructions. The MAPPCOR staff  
11                shall compile the data into a report, which shall be  
12                reviewed by the AWG [Accreditation Working Group] and  
13                provided to the PAC [Pool Administrative Committee]. The  
14                load and capability data shall be available: 1) For use by  
15                any MAPP committee or subcommittee; 2) For use by any  
16                regional, national or international reliability organization  
17                for reliability analysis and/or documenting compliance to  
18                applicable standards; 3) For submission to government  
19                agencies.

20  
21                Further, Section 4.2.1.3 of the MAPP Generation Reserve Sharing Pool Handbook  
22                states that:

23                The net generating capability rating of generating  
24                equipment included in a GRSP Member's Accredited  
25                Capability shall be based on the Uniform Rating of  
26                Generating Equipment (URGE) criteria as adopted by the  
27                Executive Committee on February 2, 1982 and as  
28                subsequently revised. Section 4.2.2.7 of this Handbook  
29                includes the latest approved revision of the URGE criteria.

30  
31                Therefore, I requested that the Applicants provide the URGE rating of existing  
32                generation in order to compare the response to OES IR 39 with the 2007 MAPP Load and  
33                Capability Report.

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<sup>3</sup> The MAPP Generation Reserve Sharing Pool Handbook may be accessed at  
[http://www.mapp.org/assets/pdf/GRSP\\_Handbook\\_20070116.pdf](http://www.mapp.org/assets/pdf/GRSP_Handbook_20070116.pdf).

1     **Q.   What did you find when you compared the data on existing generation in the**  
2         **responses to OES Information Request 39 to the MAPP Load and Capability**  
3         **Report and IPL's 2005 Integrated Resource Plan?**

4     A.   I compared data on existing generation, planned additions and retirements, and capacity  
5         purchases and sales provided in response to OES IR 39 to the data in the MAPP Load and  
6         Capability Report. I found a number of discrepancies between the data sources. I  
7         compiled a list of those discrepancies and asked the Applicants to reconcile those  
8         discrepancies in an update to OES IR No. 39. I have included a list of these  
9         discrepancies as OES Exhibit No. \_\_\_\_ (CJS-3). Applicants then provided a supplement to  
10        OES IR 39 which I included as OES Exhibit No. \_\_\_\_ (CJS-4). I then reviewed the  
11        supplement to OES IR 39 provided by the Applicants.

12           Further, as part of OES IR 39, I requested data on the Utilities' capacity purchases  
13         and sales. However, the data I received only included data regarding purchases. The  
14         supplement to OES IR 39 contains information regarding both purchases and sales. I  
15         compared the sales data provided in the supplement to OES IR 39 to the sales data  
16         included in the 2007 MAPP Load and Capability Report. I did not find any  
17         discrepancies in my comparison of the sales data.

18           As stated earlier, IPL is not a member of MAPP. Therefore, I compared IPL's  
19         supply capacity data to the data found in IPL's most recent (2005) Integrated Resource  
20         Plan in Docket No. E001/RP-05-2029. In addition, I confirmed the 406 MW firm  
21         purchase from the Duane Arnold Energy Center by reviewing the Power Purchase  
22         Agreement filed with the Commission in Docket No. E001/PA-05-1272.

1           In addition, in many cases there were slight variations between the capacity listed  
2           for a particular generation unit in the response to IR 39 and the capacity rating contained  
3           in the May 1, 2007 MAPP Load and Capability Report. I asked the Applicants to explain  
4           what accounts for the variation in capacity ratings between the two sources. The  
5           Applicant's response, which I included as OES Exhibit No. \_\_\_\_ (CJS-5), states:

6                     Because accreditation of thermal units is based on actual  
7                     performance tests which are required on an annual basis,  
8                     the resulting ratings may vary over time as a unit ages or as  
9                     it has changes in efficiencies due to equipment  
10                    replacements and upgrades. Accredited capacity of  
11                    variable generation is likely to change over the life of the  
12                    facility according to the energy production of the facility.

13  
14                    The accredited value for variable generation could also  
15                    change as a result of a change in the hour of a utility peak  
16                    demand.

17  
18                    Therefore, the fact that the values submitted to MAPP for  
19                    the 2007 MAPP Load and Liability Report and then later  
20                    provided in response to OES Information Request No. 39  
21                    were collected by the utilities at different points in time  
22                    may explain any "slight variations between the capacity  
23                    listed in the response to IR 39 and the capacity rating  
24                    contained in the May 1, 2007 MAPP Load and Capability  
25                    Report."

26  
27           As Applicants explained above, the data submitted for the May 1, 2007 MAPP  
28           Load and Capability Report was necessarily predated the data submitted in Applicant's  
29           February 4, 2008 response to OES IR 39. I conclude that Applicants' explanation of the  
30           slight variations in capacity values as listed in the response to OES IR 39 (OES Exhibit  
31           No. \_\_\_\_ (CJS-2)) and the 2007 MAPP Load and Capability Report is reasonable.



1 **Q. Did the supplement to IR 39 (OES Exhibit No. \_\_\_\_ (CJS-4)) explain the**  
2 **discrepancies you asked the Applicants to reconcile?**

3 A. In general, yes. Applicants provided an explanation for each of the discrepancies I found  
4 in the supplement to OES IR 39 and made some revisions to the data initially submitted.  
5 The explanations for and revisions to the data provided by the Applicants in the  
6 supplement to OES IR 39 are reasonable with the following five exceptions.

7  
8 **Q. Please discuss the first discrepancy.**

9 A. Based on the explanations provided by the Applicants, I have made five additional  
10 adjustments to the total capacity data provided in the supplement to OES IR 39. For  
11 Minnesota Power, the supplement to IR 39, indicates that:

12 The remaining generation units that Minnesota Power listed  
13 in the 2007 MAPP Load and Capability Report (but did not  
14 list in response to Information Request No. 39) are under  
15 the category of pool-within-pool or non-utility generators,  
16 also referred to as coincident net load. Minnesota Power,  
17 as part of MAPP, has the right to call on these generators  
18 during peak times.

19  
20 Because MP has access to this capacity, I included the capacity value listed in the  
21 2007 MAPP Load and Capability Report of these “pool-within-pool” generators as part  
22 of my estimate of Minnesota Power’s total capacity which is shown in OES Exhibit No.  
23 \_\_\_\_ (CJS-6). The generators include: Boise Cascade, International Falls, Silver Bay  
24 Power, Gordon, Solon Diesel, and SAPPI Cloquet.

25  
26 **Q. Please discuss the second discrepancy.**

27 A. For Dairyland Power Cooperative the supplement to IR 39 indicates that:

1 The generator facilities listed below were not listed in  
2 response to OES Information Request No. 39 as owned  
3 generation because they are owned by municipals that are  
4 served by Dairyland. The municipals own the generator,  
5 provide their own capacity and purchase their energy from  
6 Dairyland. Dairyland also accredits the municipal capacity  
7 as its own for use as planning reserves.  
8

- 9 • Arcadia 1-9
- 10 • Argyle HYD
- 11 • Argyle 4
- 12 • Cashton 3,5-6
- 13 • Cumberland 1-8
- 14 • Elroy 1,2,5
- 15 • Fennimore 1-5
- 16 • Forest City 1-6
- 17 • La Farge 1
- 18 • Lanesboro 1,4-5
- 19 • Merrilan 1,2
- 20 • New Lisbon 2, 5-7
- 21 • Viola
- 22

23 As Dairyland can use the capacity for planning reserves and to meet the needs of  
24 the municipalities it serves, I have included the capacity values of these generators as  
25 listed in the 2007 MAPP Load and Capability Report in my calculation of Dairyland's  
26 total capacity as shown in OES Exhibit No. \_\_\_\_ (CJS-6).  
27

28 **Q. Please discuss the third discrepancy.**

29 A. For Xcel Energy, the supplement to OES IR 39, states:

30 The capacity values associated with the following  
31 purchases was inadvertently omitted from Xcel Energy's  
32 "Firm Purchases" spreadsheet provided in response to OES  
33 Information Request No. 39: L.S. Power, St. Paul, Calpine  
34 Mankato, Manitoba Hydro (500), Cyprus, Constellation,  
35 and Minnkato.  
36

37 Xcel included the capacity values for these units in an updated table provided in  
38 the supplement to OES IR 39, but did not include these values in a separate table that

1 shows both sales and purchases also provided in the supplement to OES IR 39. I have  
2 included the capacity values for these units in my calculation as shown in OES Exhibit  
3 No. \_\_\_\_ (CJS-6).

4  
5 **Q. Please discuss the fourth and fifth discrepancies.**

6 A. Similar to Xcel, in the supplement to OES IR 39 SMMPA and Dairyland included  
7 updates of the purchase tables initially provided in the response to IR 39, but did not  
8 included the added units in the separate updated table that shows both sales and  
9 purchases. For SMMPA, the Olmsted County Waste to Energy (OWEF) unit was added  
10 to the updated purchase table, but was not added to the separate table that shows both  
11 sales and purchases. I included the capacity added for the OWEF as shown in OES  
12 Exhibit No. \_\_\_\_ (CJS-6).

13 For Dairyland, the updated purchase table and the separate table showing both  
14 sales and purchases did not match. I included capacity values and units listed in either  
15 table as shown in OES Exhibit No. \_\_\_\_ (CJS-6). The units include: Adams Wind,  
16 McNeilus Wind Farm, McNeilus Wind Farm II, Timberline Landfill, Timberline Trail  
17 Landfill, Central Disposal Landfill, Wind Farm (Iberdrola), Sarona Landfill, Bach Farm,  
18 and Daley Farm.

19  
20 **Q. What was the effect of your adjustments to correct for these discrepancies?**

21 A. I note that for each of these adjustments, my decision to include the capacity values of  
22 additional units will increase my estimate of existing capacity, and thus will decrease  
23 OES Witness Ham's calculation of interconnection need.

1 **IV. ESTIMATE OF EXISTING SUPPLY CAPACITY FOR 2009**

2  
3 **Q. What is your estimate of existing capacity for 2009 based on the information you**  
4 **have received to date?**

5 A. I have attached my estimate of existing capacity based on the response and supplemental  
6 response to OES IR 39 as OES Exhibit No. \_\_\_\_ (CJS-6). In addition to the adjustments  
7 to the data provide by the Applicants discussed above, I made several assumptions in  
8 calculating the total capacity of the Utilities in 2009. Those assumptions are as follows:

- 9 • The wind generation capacity provided in response to OES IR 39 is the  
10 nameplate capacity. OES Witness Susan Peirce provided testimony that  
11 estimates the accredited capacity of wind as 13.5 percent of nameplate  
12 capacity. Using the 13.5 percent estimate of accredited capacity for wind  
13 resources, I adjusted the total capacity supply of each utility system to include  
14 the accredited capacity instead of nameplate capacity.
- 15 • For capacity additions, I included any capacity to be added by 2009 and that  
16 had obtained a certificate of need from the Commission, if required.
- 17 • As explained in the supplement to OES IR 39 ,OES Exhibit No. \_\_\_\_ (CJS-4),  
18 the retirement of Xcel's High Bridge plant was listed twice in the response to  
19 OES IR 39 and the capacity addition for Riverside should be 508 MW instead  
20 of the 439 MW provided in the initial response to OES IR 39. In my  
21 calculation, I properly included the retirement of the High Bridge plant once  
22 and used the corrected capacity addition for Riverside.
- 23 • For Xcel's purchases, the Commercial Operation Date (COD) of several C-  
24 BED purchase agreements were "not yet determined." However, I assumed

any C-BED project with an approved Power Purchase Agreement but with a COD that was not yet determined would be in place in 2009.

- For all purchases, if the term of the contracts were not provided or were unavailable, I assumed the contract to be in place in 2009.
- For GRE, the Elm Creek Wind Facility was listed as both a generation addition and purchase. I only included Elm Creek as a purchase.
- For RPU, I did not include a purchase of 216 MW from SMMPA as that capacity is included as part of SMMPA.
- Revised owned generation totals were provided for SMMPA, IPL, MRES, and Dairyland in the supplement to OES IR 39. I have included those revised totals with the adjustment for Dairyland noted above.

As stated above, revised tables regarding participation purchases and sales, and firm purchases and sales were provided in the supplemental response to OES IR 39 for each utility system. IPL, SMMPA, MRES, and Dairyland provided updated tables regarding owned and planned generation. As discussed above, I have concluded that the revisions made by Applicants are reasonable with the noted five exceptions, and therefore I used the revised capacities provided in the supplemental response. I have calculated the capacity supply in 2009 so that OES Witness Mr. Ham can evaluate the Applicants' claimed interconnection need from 2009 to 2020 presented in Appendix A of the Application. Based on these assumptions, at this time, I calculate the total capacity of the 16 Utilities used by the applicants to determine the need for the proposed lines to be 22,841 MW for 2009.

1 **Q. Did you compare the information provided in response to OES IR 39 to another**  
2 **source of existing generation data?**

3 A. Yes. I also compared the inventory of renewable resources provided in response to OES  
4 Information Request No. 34, included as OES Exhibit No. \_\_\_\_ (SLP-10), to the  
5 renewable resources provided in the supplemental response to OES Information Request  
6 39. There were also a few discrepancies between the responses to those information  
7 requests. I have included a list of those discrepancies as OES Exhibit No. \_\_\_\_ (CJS-7),  
8 and I recommend that the Applicants reconcile those differences in their Rebuttal  
9 Testimony.

10  
11 **V. CONCLUSIONS AND RECOMMENDATIONS**

12 **Q. Please summarize your recommendations.**

13 A. I recommend that the Commission:

- 14
  - Find that the estimated capacity for 2009 of the utility systems used in  

15 determining the need for the proposed transmission lines to be 22,841 MW.

16 Further, in rebuttal testimony, I recommend that:

- 17
  - Applicants reconcile the discrepancies between the responses to OES IR 34  

18 and OES IR 39 as provided in OES Exhibit No. \_\_\_\_ (CJS-7).

19  
20 **Q. Does this conclude your testimony?**

21 A. Yes.