OAH 8-2500-30760
MPUC Docket No. E-002 / CN-12-1240

STATE OF MINNESOTA
OFFICE OF ADMINISTRATIVE HEARINGS

FOR THE PUBLIC UTILITIES COMMISSION

In the Matter of the Petition of Northern States Power Company to Initiate a Competitive Resource Acquisition Process	**FINDINGS OF FACT, CONCLUSIONS OF LAW AND RECOMMENDATION**

On March 5, 2013, the Minnesota Public Utilities Commission (MPUC or Commission) concluded that Northern States Power Company d/b/a Xcel Energy (Xcel) had demonstrated the need for an additional 150 megawatts (MW) of electricity generation by 2017,~~. The Commission further concluded that it was possible that this need could continue to~~ increasing~~e~~ up to 500 MW by 2019.

Minn. Stat. § 216B.2422, subd. 5 authorizes the Commission to select the resources to meet such needs through a competitive procurement.

In this instance, because there were several different energy companies, including Xcel, that could meet the need for new generation, and a complex array of considerations between and among the competing proposals, the Commission set this matter on for a contested case hearing. It sought a report and recommendation from an Administrative Law Judge following a more complete development of the record. Specifically, the Commission directed that a contested case be undertaken to identify the resource proposal or proposals that will provide the most reasonable and prudent strategy for Xcel to meet the needs of its service area.

On October 21 and 22, 2013, Administrative Law Judge Eric L. Lipman presided over an evidentiary hearing on these issues. The following parties noted their appearance at the evidentiary hearing:

James R. Denniston, Assistant General Counsel, Northern States Power Company, and Michael C. Krikava, Thomas Erik Bailey and Kodi J. Church, Briggs and Morgan, appeared on behalf of Northern States Power Company (Xcel).

Michael J. Bradley, Moss & Barnett and Donna Stephenson, Associate Counsel, appeared on behalf of Great River Energy (GRE).

Kevin Reuther, Legal Director of the Minnesota Center for Environmental Advocacy (MCEA), appeared on behalf of MCEA, Fresh Energy, Sierra Club, and Izaak Walton League - Midwest Office (Environmental Intervenors).

Brian M. Meloy and Andrew J. Gibbons, Leonard, Street and Deinard, appeared on behalf of Calpine Corporation (Calpine).

Eric F. Swanson, Winthrop & Weinstine, appeared on behalf of Invenergy Thermal Development, LLC (Invenergy).

Christina K. Bruvsen, Fredrikson & Byron, appeared on behalf of Geronimo Wind Energy, LLC, d/b/a Geronimo Energy (Geronimo).

Ryan M. Norrell, Special Assistant Attorney General, appeared on behalf of the North Dakota Public Service Commission Advocacy Staff (Advocacy Staff).

Julia E. Anderson, Assistant Attorney General, appeared on behalf of the Minnesota Department of Commerce, Division of Energy Resources, Energy Regulation and Planning (DOC-DER or Department).

STATEMENT OF THE ISSUE

What resource proposals provide the most reasonable and prudent strategy for Xcel to meet the needs of its service area?

SUMMARY OF CONCLUSIONS

The ~~Administrative Law Judge concludes that the~~ most reasonable and prudent solution is to ~~select scalable projects that meet Xcel's near-term shortfalls and for the Commission to conduct a second procurement for needs which may occur after 2019. The Administrative Law Judge further concludes that combining Geronimo's proposal with the GRE's proposal, represents the most reasonable and prudent alternative to meet Xcel's near-term needs.~~ send Calpine's Mankato project and Invenergy's Cannon Falls project to Power Purchase Agreement (PPA) negotiations. Following review of the negotiated PPAs, the Commission should select the two most reasonable and prudent projects of the following three projects: Calpine's Mankato project, Invenergy's Cannon Falls project, and Xcel's Black Dog Unit 6 project. Absent material differences negotiated in the PPAs, the most reasonable solution is the combination of the Black Dog and Calpine projects. The Commission should order Xcel to issue an All-Solar Request for Proposals (Solar RFP) as soon as possible to obtain the overall best solar projects for meeting Xcel's obligations under Minnesota's recently enacted solar mandate.

Based upon the submissions of the parties and the contents of the hearing record, the Commission should ~~Administrative Law Judge~~ make~~s~~ the following:

FINDINGS OF FACT

I. Plans ~~and Forecasts~~ Predating the Receipt of Proposals in this Docket

1. In August of 2010, Xcel filed an integrated resource plan (IRP) for the planning period of 2011 through 2025.[1]

2. Utilities in Minnesota file biennial resource plans with the Commission. These plans report upon the utility's: (1) projected energy needs over the next 15 years; (2) plans for meeting the projected need; (3) planning process for meeting the projected need; and (4) bases

for selecting a specific resource mix proposed to meet the projected need.[2]

3. On March 15, 2011, in parallel filing with the Commission, Xcel sought a Certificate of Need for its Black Dog Generating Plant Repowering Project. In this submission, Xcel sought approval for the development of 450 megawatts (MW) of energy resources. These generation resources would address shortfalls in generation that Xcel projected would occur in 2014.[3]

4. ~~I~~On December ~~of~~ 7, 2011, following a revision of its demand projections that account for slower economic growth, the loss of wholesale customers, and changes to Xcel's plans for the current planning cycle, as outlined in its December 1, 2011 IRP Update, Xcel proposed to cancel the Black Dog Generating Station project. It concluded that the demand for electricity would be lower than it earlier projected and thus this expansion project was not needed.[4]

5. On February 8, 2012, Xcel filed corrections to its revised plan.[1]

6. On June 1, 2012, Xcel proposed in a separate docket, contrary to its IRP, to phase out Solar*Rewards, a program that subsidizes customer purchases and installation of photovoltaic solar cells; however, the Department directed Xcel to maintain the Solar*Rewards program.[2]

7. On June 12, 2012, the Department filed *Comments,* and on August 13, 2012 filed *Reply Comments,* in Xcel's IRP recommending Commission approval of Xcel's 2011-2025 IRP with modifications.[3]

8. On August 30, 2012 Xcel filed reply comments further revising its resource plan and proposing to add 400-600 MW of new capacity by 2017-2019 through soliciting proposals from outside parties through a competitive process.[4]

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[1] See, 2010 RESOURCE PLAN, *In the Matter of Xcel Energy's 2011-2025 Integrated Resource Plan*, Docket No.E002/RP-10-825 (Aug. 2, 2010).

[2] Minn. Stat. § 216B.2422 and Minn. R. 7843.0400.

[3] PETITION, *In the Matter of the Petition of Northern States Power Company for a Certificate of Need for the Black Dog Generating Plant Repowering Project,* Docket No. E002/CN-11-184 (Mar. 15, 2011).

[4] *In the Matter of the Petition of Northern States Power Company for a Certificate of Need for the Black Dog Generating Plant Repowering Project*, Docket No. E-002/CN-11-184, MOTION TO WITHDRAW APPLICATION AND REQUEST PURSUANT TO MINN. R. 1400.7600 FOR CERTIFICATION OF THIS MOTION TO THE MINNESOTA PUBLIC UTILITIES COMMISSION (Dec. 7, 2011); *see also*, Hearing Transcript - Vol. 1 at 130 ("We've been working through our potential resource need in our resource plan docket and the outcome of that was the Commission's order identifying a resource need. At the same time, we initiated a proposal for a combined cycle unit at the Black Dog power plant site. As the great recession hit and our projected demand for electricity declined, we asked to withdraw that petition and ultimately the Commission concurred with that.").

[1]*See,* ORDER ESTABLISHING PROCEDURAL SCHEDULES AND FILING REQUIREMENTS, *In the Matter of Xcel Energy's 2011-2025 Integrated Resource Plan*, Docket No. E-002/RP-10-825 at 2 (Nov. 30, 2012).

[2] *Id* at 2

[7] *Id* at 1.

[8] *Id* at 2.

9. ~~5.~~ In late October of 2012, Xcel likewise decided that it would not seek to increase the generating capacity of its Prairie Island Nuclear Generating Plant.[5]

10. ~~6.~~ In proceedings on its five-year action plan, Xcel reduced its estimates of future demand so as to "reflect, among other things, slower-than-projected economic growth, a loss of wholesale customers, changes in Xcel's wind procurement strategy, reassessments of Xcel's program for refurbishing Black Dog Units 3 and 4 and the Prairie Island Plant, and the anticipated expiration of the Production Tax Credit."[6]

11. ~~7. Mindful of the change in the demand forecasts, t~~The Commission directed Xcel to prepare a notice plan for soliciting proposals to meet the ~~reduced~~ Commission-determined needs in a competitive resource acquisition process. The Commission stated:

> [T]he current docket supports the finding that Xcel will need an additional 150 MW in 2017, increasing up to 500 MW by 2019. Moreover, a broad range of resources could contribute to meeting this need, justifying solicitation of a broad range of proposals. In particular, Xcel should invite proposals for meeting all of the forecasted need, or any part of it. Xcel should invite proposals for adding peaking resource[s], intermediate resources, or a combination of the two. Xcel should invite proposals that rely on building new generators, as well as proposals that rely on existing generators.[7]

12. ~~8.~~ The precise quantity of energy to be obtained through this process was not specified ~~stated~~. The Commission stated:

> In contrast, parties disagree about the magnitude of Xcel's needs. For example, the Environmental Intervenors and the Large Power Intervenors argue that the 500 MW figure may exceed customer demand. In contrast, Calpine and the Department argue that the 500 MW figure is justified, and may even be too low.
>
> The idea that Xcel will need an additional 500 MW by 2019 is well-supported in the record. Indeed, Xcel has previously argued that it would need up to 600 MW of additional capacity – and Xcel generated this estimate before it cancelled plans to add 118 MW of new capacity to its Prairie Island plant.
>
> For purposes of Xcel's competitive bidding docket, the Commission finds it appropriate to solicit proposals for *an additional* 150 MW in 2017, increasing *up to* 500 MW by 2019. This statement does not preclude Xcel from acquiring more than

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[5] SUPPLEMENTAL FILING -NOTICE OF CHANGED CIRCUMSTANCES, *In the Matter of the Application of Northern States Power Company for a Certificate of Need for the Prairie Island Nuclear Generating Plant for an Extended Power Uprate*, Docket Nos. E002 / CN-08-509, E002 / RP-10-825, E002 / CN-11-184 (Oct. 22, 2012).

[6] *See,* ORDER ESTABLISHING PROCEDURAL SCHEDULES AND FILING REQUIREMENTS ~~RESOURCE ACQUISITION PROCESS~~, *In the Matter of Xcel Energy's 2011-2025 Integrated Resource Plan*, Docket No. E-002/RP-10-825 at 6 (Nov. 30, 2012).

[7] *In the Matter of Xcel Energy's 2011-2025 Integrated Resource Plan*, Docket No. E-002 / RP-10-825, ORDER APPROVING PLAN, FINDING NEED, ESTABLISHING FILING REQUIREMENTS AND CLOSING DOCKET at 2 and 6 (Mar. 5, 2013) (emphasis added); *see also,* Ex. 83 at 3 (Rakow Direct).

150 MW of new resources by 2017.[8]

~~Instead, the Commission identified a range of 150 MW in 2017, potentially increasing to 500 MW by 2019.~~ Moreover, the Commission concluded that this description sufficed "to inform potential bidders of the scope of projects that the Commission will be considering."[9]

13. ~~9.~~ Because of a specialized statutory exemption, the project or projects selected in this Docket will not require a separate Certificate of Need.[10]

14. ~~10.~~ The Commission set a deadline of April 15, 2013 for submission of proposals to meet some, or all, of this need.[11]

15. ~~11.~~ On April 15, 2013, the Commission received proposals from Calpine, Geronimo, GRE, Invenergy and Xcel.[12]

II. Events that Followed the Receipt of Proposals ~~which Impact the Forecasted Need for Energy~~

16. ~~12.~~ Following the receipt of proposals, there were ~~have been~~ ~~significant~~ changes pertaining to energy resources on Xcel's system and potential changes in need estimated by Xcel; all factors were analyzed in this proceeding ~~regulatory and operational environment~~.[13]

17. ~~13.~~ On May 21, 2013, the Legislature amended Minn. Stat. § 216B.1691, by adding a new subdivision. The amendment established a new solar energy mandate that obliges Xcel (and other utilities) to acquire 1.5 percent of its retail sales from solar energy by 2020. Moreover, these requirements are in addition to existing law which requires Xcel to provide 30 percent of its retail energy needs through renewable energy by the year 2020. The statute states:

> Subd. 2f. Solar energy standard. (a) In addition to the requirements of subdivisions 2a and 2b, each public utility shall generate or procure sufficient electricity generated by solar energy to serve its retail electricity customers in Minnesota so that by the end of 2020, at least 1.5 percent of the utility's total retail electric sales to retail customers in Minnesota is generated by solar energy.[14]

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[8] *Id* at 6.

[9] *Id. at* 2 and 6.

[10] Minn. Stat. § 216B.2422, subd. 5 (b).

[11] NOTICE AND ORDER FOR HEARING, OAH 8-2500-30760 at 2 (June 21, 2013).

[12] *Id.*

[13] Ex. 49 at ~~2~~ 7 (Alders Direct) (The "September ~~6~~ 2013 Update of the Company's need indicates a capacity deficit of 93 MW in 2017, which grows to 307 MW by 2019. However, there are factors that create uncertainty and could materially affect our resource need assessment. The new need assessment is another data point that should be considered in analyzing which resource proposals should be selected to address the range of the Company's potential need in the 2017-2019 timeframe").

[14] Minn. Stat. § 216B.1691, subd. 2f; *see also,* 2013 Laws of Minnesota, Ch. 85, Art. 10, § 3; Minn. Stat. § 216B.1691, subd. 2a (b).

18. ~~14.~~ In order to meet the requirement that an amount equal to 1.5 percent of its retail electric sales is drawn from solar energy resources, Xcel estimates it will require 455,919 MWh of solar energy resources by 2020.[15]

19. ~~15.~~ On July 16, 2013, Xcel filed a petition for approval of 600 MW of wind generation. Depending upon the availability of transmission upgrades, Xcel forecasted that these wind generation resources would be placed into service ~~between 2017 and 2019~~ in 2015 and provide accredited capacity in 2021.[16]

20. ~~16.~~ On August 9, 2013, Xcel filed a petition for approval of an additional 150 MW of wind generation. Xcel projected that these wind resources would be operational and available to Xcel by 2015 but would not provide accredited capacity until 2021.[17]

21. ~~17.~~ 750 MW of wind resources represents much larger acquisitions than Xcel had forecasted it would make in the near-term. Earlier in the year, Xcel projected that it would purchase 200 MW of energy from wind resources.[18] Dr. Rakow's first round of Strategist analysis included a run of each scenario with 400 MW, 600 MW, and 800 MW of wind added, and in his third round he ran both 750 MW and 600 MW of wind. The Department did not run any scenarios with no wind added.[19]

22. ~~18.~~ On October 4, 2013, the Commission determined that Xcel's plans to acquire a total of 750 MW of wind generation constituted a changed circumstance to its resource plan. The Commission ordered Xcel to file a Notice of Changed Circumstances reflecting these changes.[20]

23. Dr. Rakow explained that when wind units representing the four proposals in Docket Nos. E002/M-13-603 and E002/M-13-716 were added, equivalent generic wind energy were removed to keep the overall quantity of wind energy for the duration of the Strategist run about equal to Xcel's renewable energy standard requirements. In other words, these specific wind resources replaced generic wind resources. The Department did not perform an analysis similar to Xcel's removal of wind. Contrary to Xcel's method, the Department's wind contingency analysis did not show a significant impact on the costs of bids; the overall impact of differing quantities of wind on the PVSC differences across scenarios was not significant.[21]

24. ~~19.~~ While this proceeding was underway, the Midcontinent Independent System Operator (MISO) sought a change in the way that "reserve margins" are calculated for electric utilities in the Midwest. "Reserve margins" are the amount of generation capacity that each utility must have in excess of their expected peak demand. These reserve resources can be

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[15] Ex. 57 at 8 (Engelking Direct) (citing Xcel Energy Comments, *In the Matter of the Request for Filings From Electric Utilities on Customers Excluded From the Solar Energy Standard*, Docket No. E-999/CI-13- 542 at 4 (August 15, 2013)).

[16] *In the Matter of the Petition of Xcel Energy for Approval of the Acquisition of 600 MW of Wind Generation*, Docket No. E-002/M-13-603.

[17] *In the Matter of the Petition of Xcel Energy for Approval of the Acquisition of 150 MW of Wind Generation*, Docket No. E-002/M-13-716.

[18] *See, e.g., Wind RFP Update*, Docket No. E-002/RP-10-825 at 1 (February 4, 2013).

[19] Ex. 86 at 14 (Rakow Rebuttal).

[20] *Order Requiring Notice of Changed Circumstances and Granting Intervention,* Dockets E-002/RP-10- 825, E-002/CN-12-1240, E-002/M-13-603, E-002/M-13-716 (October 4, 2013).

[21] Ex. 86 at 14-15 (Rakow Rebuttal).

called upon to maintain the electric grid's reliability in the event of unplanned outages of generation or transmission facilities. MISO establishes a new reserve margin percentage each year. MISO also establishes methods for calculating the available capacity of generation units in the region and applying these amounts to the needed reserve margin.[22]

25. ~~20.~~ In the past, MISO has calculated reserve margins so that they ~~would be sufficient to meet MISO system peaks~~ were applied to each utility's peak demand. However, MISO recently proposed to apply the reserve margin to each utility's demand at the time of MISO's system peak.[23]

26. ~~21.~~ Yet, the MISO system can, and frequently does, reach its system peak at a different hour than Xcel's system. Between 2006 and 2012, for example, customer demand on Xcel's system was, on average, 5 percent lower than during MISO's peak times. The difference varied from zero percent (in 2006) to 14 percent (in 2007).[24]

27. ~~22.~~ The change in MISO reserve margins became effective on October 30, 2013 and will be implemented for the 2014 - 2015 planning year.[25]

28. ~~23.~~ While many stakeholders have asked MISO to solidify its reserve margin methodology so that the reserve amounts do not vary widely from year-to-year, those longer-term planning metrics are not now in place. MISO has pledged that it will look into this issue in the coming months and hopes to provide updated long-term planning criteria by the fall of 2014.[26]

29. ~~24.~~ Calculating the minimum reserve capacity based upon the MISO system peak and applying either MISO's 2013 or 2014 reserve margin values to the resource need assessment has a significant impact upon the amount of reserves Xcel must maintain in order to meet applicable reliability standards. The net impact of the methodology ~~changes~~ reduces Xcel's reserve requirements by approximately 200 MW. However, this 200 MW estimate is not reduced for any potential reduction in the quantity of conservation and load management (collectively, DSM) due to the change in the hour used for reserve ratio purposes.[27] In addition, it does not take into account MISO's expected increase of 1 percent in reserve requirement, based on information presented by MISO in a meeting in October, 2013.[28]

30. ~~25.~~ In recent weeks, Xcel has revised downward its ~~projected energy~~ forecasted growth rate in demand and resulting capacity needs. If the minimum reserve requirements that MISO applies today are included in a need forecast, alongside more recent load projections, there ~~is~~ would be no shortfall in capacity through 2018 and only 26 MW is needed by Xcel in

[22] Ex. 46 at 5-6 (Wishart Direct); Ex. 83 at 20 n.8 (Rakow Direct).

[23] Ex. 83 at 22-24 (Rakow Direct).

[24] Ex. 46 at 8-9 and Table 3 (Wishart Direct); Ex. 83 at 23-24 (Rakow Direct).

[25] Midcontinent Indep. Sys. Operator, Inc., 145 FERC 61,077 (Oct. 29, 2013) (order conditionally accepting filing in Docket No. ER 13-2298-000).

[26] Ex. 46 at 10 (Wishart Direct); *see also*, Ex. 49 at 7 ~~8~~ (Alders Direct) ("the Midcontinent Independent System Operator's resource adequacy process is in flux").

[27] Ex. 46 at 9~~10~~ (Wishart Direct) and Ex. 83 at 24-25 (Rakow Direct).

[28] Ex. 83 at 39 (Rakow Direct).

2019.[29] However, this calculation assumes no offsetting adjustments, such as reduced DSM capability due to the new reserve requirements and MISO's expected increase in reserve requirement.

~~26. In a November 4, 2013 filing with the Commission, Xcel projected that its actual sales would fall by .6 percent in 2014 and another .4 percent in 2015.~~[~~30~~]

31. ~~27.~~ Dr. Rakow and the Department express a different view. They assert that Minnesota's economy is still in the process of recovering ~~improving~~ and that demand for electricity ~~will~~ may increase faster than currently forecasted as the economy improves.[31]

32. ~~28.~~ The Department likewise ~~asserts~~ states the fact that only Xcel's Fall 2011 forecast, and not its most-recent estimates, has been approved by the Commission. It states further that it has not verified the accuracy of Xcel's spring 2013 sales forecast, nor relied upon its projections in this proceeding.[32] Nonetheless, the Department's analysis of the bids employed a forecast band wide enough to encompass Xcel's spring 2013 sales forecast.[33]

33. ~~29.~~ Given the uncertainty surrounding its resource needs, the regulatory requirements that it will be required to meet in the near-term, and the direction of the state's economy, Xcel recommends that the Commission authorize contract options that permit it to postpone the service dates of any projects that are selected in this proceeding, and perhaps, cancel those projects altogether.[34]

34. ~~30.~~ The Department ~~joins~~ agreed with Xcel that flexible in-service dates could result in substantial cost savings.~~in this recommendation, noting that delayed in- service dates for Invenergy's projects could result in substantial cost savings.~~[35] However, the Department did not take a position on cancelling projects.

35. ~~31.~~ It is Xcel's expectation that if any offeror selected in this process incurs expenses in order to meet an in-service date specified in a Purchase Power Agreement, those expenses would be recoverable from ratepayers in the event that the project is later cancelled.[36] The Department did not take a position on recovery of costs related to cancelled projects.

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[29] *Id. At* 2 ~~7~~ and 10 (Wishart Direct).

~~[30] *See, In the Matter of the Application of Northern States Power Company for Authority to Increase Rates for Electric Service in Minnesota*, Docket No. E002 / GR-13-868, Direct Testimony of Jannell E. Marks at 5 (Nov. 4, 2013).~~

[31] Ex. 83 at 41 (Rakow Direct).

[32] Hearing Transcript - Vol. 2 at 29-30.

[33] Ex. 76 at 13 (Shah Direct).

[34] Ex. 46 at 2 and 11 (Wishart Direct); Ex. 49 at 8 (Alders Direct); Hearing Transcript - Vol. 1 at 125, 134 and 140.

[35] Ex. 86 at 11-12 (Rakow Rebuttal); *See,* Hearing Transcript, Vol. 2 at 55.

[36] Hearing Transcript, Vol. 1 at 126-27.

III. Procedural Practice in the Contested Case

36. ~~32.~~ On June 3, 2013 – after the April 15, 2013 deadline for submission of proposals – Ecos Energy, LLC (Ecos Energy) petitioned the Commission for leave to submit a generation proposal.[37]

37. ~~33.~~ On June 6, 2013, the Commission met to consider the matter of Xcel's resource acquisition process.[38]

38. ~~34.~~ In the Commission's June 21, 2013 *Notice and Order for Hearing,* the Commission referred this matter to the Office of Administrative Hearings for a contested case proceeding. The Commission also:

(A) Denied the request of Ecos Energy for permission to submit a generation proposal.

(B) Determined that the developer of a project chosen through this Commission-approved competitive resource acquisition process is exempt from securing a certificate of need under Minn. Stat.§ 216B.243 prior to construction.

(C) Found that the proposals filed by Calpine, Geronimo, GRE, Invenergy and Xcel were substantially complete.

(D) Identified the ultimate issue to be the identification of the resource proposal or proposals that will provide the most reasonable and prudent strategy for Xcel to meet the needs of its service area.

(E) Directed that an Environmental Report be prepared by the Department of Commerce, Energy Environmental Review and Analysis (EERA) for the Commission and:

(1) Authorized EERA to focus its analysis on the substantially complete alternatives, and on a no-build alternative for each of these alternatives;

(2) Requested that EERA prepare an Environmental Report sufficient to meet the requirements set forth in Minn. R. 7849, as varied, for all of the substantially complete alternatives;

(3) Requested that EERA review Geronimo's Solar Proposal cumulatively for the up to 31 sites; and

(4) Requested that EERA treat the GRE capacity credit proposal as capacity only.

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[37] NOTICE AND ORDER FOR HEARING, OAH 8-2500-30760 at 2 (June 21, 2013).

[38] *Id*.

(F) Designated the following entities as parties to the contested case proceeding: Calpine, Geronimo, GRE, Invenergy, Xcel, the Department and the Environmental Intervenors.[39]

39. ~~35.~~ The Administrative Law Judge convened a prehearing conference on July 1, 2013 and established a schedule for further proceedings.[40]

40. ~~36.~~ Ecos Energy filed a Petition to Intervene on June 7, 2013.[41]

41. ~~37.~~ Ecos Energy filed a Verified Petition to Intervene, on July 10, 2013.[42]

42. ~~38.~~ The North Dakota Public Service Commission Advocacy Staff filed a Petition to Intervene on July 31, 2013.[43]

43. ~~39.~~ On August 5, 2013, the Commission denied the reconsideration motion of Ecos Energy to submit a proposal out of time.[44]

44. ~~40.~~ On August 21, 2013, having considered objections, the Administrative Law Judge denied the Petition to Intervene from Ecos Energy and granted the Petition to Intervene from the North Dakota Advocacy Staff.[45]

45. ~~41.~~ On September 5, 2013, Ecos Energy sought Reconsideration, or in the alternative, Certification of, its Petition to Intervene.[46]

46, ~~42.~~ On September 27, 2013, the following parties filed Direct Testimony: Calpine, Geronimo, GRE, Invenergy, Xcel, North Dakota Advocacy Staff and the Department.[47]

47. 43. On October 1, 2013, having considered objections, the Administrative Law Judge denied Ecos Energy's Motion for Reconsideration and its alternative Motion for Certification.[48]

48. On October 1, 2013, Xcel filed its Notice of Changed Circumstances Proposal To Add 750 MW of Wind Resources.[49]

49. On October 4, 2013, the Commission determined that Xcel's plans to acquire 750 MW of wind generation constituted a changed circumstance under resource planning rules, and ordered Xcel to file a Notice of Changed Circumstances in dockets including the present docket, E002/CN-12-1240. The Commission issued its *Order Requiring Notice Of Changed*

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[39] I*d.* at 4.
[40] SECOND PREHEARING ORDER, OAH 8-2500-30760 (July 17, 2013).
[41] eDocket No. 20136-87947-01.
[42] eDocket No. 20137-88996-01.
[43] eDocket No. 20138-89905-01.
[44] ORDER DENYING INTERVENTION, OAH 8-2500-30760 (August 5, 2013).
[45] THIRD PREHEARING ORDER, OAH 8-2500-30760 (August 21, 2013).
[46] eDocket No. 20139-90988-01.
[47] *See generally,* MPUC Docket No. 12-1240 (September 27, 2013).
[48] FOURTH PREHEARING ORDER, OAH 8-2500-30760 (October 1, 2013).
[49] eDocket No. 201310-91999-01

Circumstances and Granting Intervention.[50]

50. ~~44.~~ On October 8, 2013, the Xcel Large Industrials (XLI) filed a Petition to Intervene.[51]

51. ~~45.~~ On October 10, 2013, the Administrative Law Judge set the evidentiary hearing to begin on Tuesday, October 22, 2013.[52]

52. ~~46.~~ On October 14, 2013, EERA issued the Environmental Report.[53]

53. ~~47.~~ On October 15, 2013, the Honorable Steve M. Mihalchick presided over a public hearing at the State Office Building in St. Paul, Minnesota.[54]

54. ~~48.~~ On October 18, 2013, the following parties filed Rebuttal Testimony: Calpine, Geronimo, GRE, Invenergy, Xcel, and the Department.[55]

55. ~~49.~~ On October 21, 2013, the Administrative Law Judge: (1) denied XLI's Petition to Intervene; (2) extended the public comment period by 21 days to match the deadline for the submission of initial briefs from the parties; and (3) invited both XLI and Ecos Energy to submit briefs as *amicus curiae* by the close of the extended deadline.[56]

56. ~~50.~~ On October 22 and 23, 2013, the Administrative Law Judge convened an evidentiary hearing at the State Office Building in St. Paul, Minnesota.[57]

57. ~~51.~~ On November 22, 2013, the public comment period closed. Approximately 60 public comments were filed with the Commission, including 17 from local government representatives, 30 from local landowners and individuals, 11 from organizations and companies and 2 from federal and state government agencies' representatives.[58]

58. ~~52.~~ On November 22, 2013, Calpine, Geronimo, GRE, Invenergy, Xcel, the Department and the Environmental Intervenors filed initial briefs.[59]

59. ~~53.~~ The hearing record closed at 4:30 p.m. on Friday, December 6, 2013, following receipt of the parties' reply briefs.[60]

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[50] eDocket No. 201310-92134-02.
[51] eDocket No. 201310-92220-01.
[52] AMENDED SEVENTH PREHEARING ORDER, OAH 8-2500-30760 (October 10, 2013).
[53] Ex. 38.
[54] eDocket No. 201311-93216-01.
[55] *See generally,* MPUC Docket No. 12-1240 (October 18, 2013).
[56] *See,* EIGHTH PREHEARING ORDER, OAH 8-2500-30760 (October 21, 2013).
[57] Hearing Transcripts, Volumes 1 and 2 (October 22 and 23, 2013).
[58] *See,* eDocket No. 201311-94078-01.
[59] *See generally,* MPUC Docket No. 12-1240 (November 22, 2013).
[60] *See generally,* MPUC Docket No. 12-1240 (December 6, 2013).

IV. Overview of the Proposals

60. ~~54.~~ The Commission accepted proposals from five offerors[61]:

(1) Xcel's 215 MW Black Dog 6 combustion turbine peaking facility and two 215 MW combustion turbine units at a new site near Hankinson, North Dakota, Red River Valley Units 1 and 2;

(2) Calpine's ~~345 MW combined cycle turbine intermediate facility at Mankato~~ : expansion of the existing natural-gas fired Mankato Energy Center by 290 MW of intermediate capacity and 55 MW of peaking capacity;

(3) Geronimo: ~~Energy's 100 MW distributed solar capacity intermittent Resource~~ build 100 MW of solar generation using photovoltaic panels, located on up to 31 sites adjacent to substations, ranging from 2 to 10 MW per site;

(4) GRE's ~~proposed sale of capacity credits~~ two proposals to sell Xcel MISO Zone 1 Resource Credits (ZRCs)[62]; and,

(5) Invenergy, with a 179 MW combustion turbine peaking facility at Cannon Falls and two 179 combustion turbines at Hampton.[63]

61. ~~55.~~ Because three of the offerors proposed projects utilizing gas-fired turbines, James Alders, Xcel's Rates and Regulatory Affairs Consultant, noted the differences between combined cycle and combustion turbines:

> It's a large combustion turbine fired with natural gas. Peaking units tend to operate very few hours during the year, only when the demand for electricity is at its highest in the summer. The proposal by Calpine, and they can speak to this in more detail, is called a combined cycling unit, and it is a combustion turbine where the flue gas from that combustion turbine then is used to heat water and create steam in a second cycle to produce more electricity. The economics of those sorts of facilities are such that they're often used more often during the year in an intermediate role in our system.[64]

62. Calpine's Mr. Flumerfelt added:

> It's a combustion gas turbine. But instead of releasing the exhaust heat directly into the atmosphere, we capture that exhaust heat, turn it into steam, and are able to generate additional power.[65]

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[61] Ex.83 at 2-3 (Rakow Direct)

[62] Ex.83 at 2 (Rakow Direct) ("A ZRC is a credit for resources that count towards MISO resource adequacy requirements. By selling ZRCs GRE would provide Xcel resources that would count for reliability purposes. However, GRE's proposal would not provide Xcel energy production rights.")

[63] NOTICE AND ORDER FOR HEARING, OAH 8-2500-30760 at 9 (Jun. 21, 2013).

[64] Public Hearing Transcript, Vol. 1 at 11-12 (Alders).

[65] Public Hearing Transcript, Vol. 1 at 14 (Flumerfelt)

V. Features of the Proposal Submitted by Xcel

63. ~~56.~~ Xcel proposed to construct three natural-gas-fired, simple-cycle, 215 megawatt (MW) combustion turbine generators sequentially to match the identified need.[66]

64. ~~57.~~ The first combustion turbine unit would be located at Xcel's Black Dog generating plant in Burnsville, Minnesota. Xcel likewise proposes a flexible in-service date of 2017, 2018 or 2019.[67]

65. ~~58.~~ This unit would substantially replace the coal-fired generating capacity at the Black Dog site.[68]

66. ~~59.~~ Xcel's Black Dog 6 project would be built in the existing powerhouse at the Black Dog site, in the area where Unit 4 is currently located. This siting would allow Xcel to maximize the use of existing infrastructure and maintain generation within its largest load center.[69]

67. ~~60.~~ The exhaust stack would be approximately 200 feet tall and would be located adjacent to the unit, in the area of the existing Unit 4 boiler.[70]

68. ~~61.~~ Unit 6 would be connected to the existing 115 kV switchyard and transmission system. For this reason, no upgrades to the existing 115 kV transmission system would be required to bring Unit 6 into service.[71]

69. ~~62.~~ The unit would be fueled entirely by natural gas. CenterPoint Energy currently serves the plant site. Xcel proposes to secure additional natural gas supply through a competitive process. Xcel anticipates that the winning vendor may need to replace the existing pipeline serving the plant with a new higher pressure natural gas line from the Cedar Town Border station.[72]

70. ~~63.~~ Xcel proposes a Model F combustion turbine. This combustion turbine can generate 150 MW within ten minutes of a "cold start," and operates in a range between 50 to 100 percent load while meeting emission limits. The unit has faster ramp rates over the load range. During summer heat and humidity conditions, the maximum output of the unit is approximately ~~215~~ 208 MW.[73]

71. ~~64.~~ The Black Dog plant is located on a 35-acre parcel. The plant site is well-buffered within a still larger 1,900-acre area owned by Xcel.[74]

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[66] Ex. 1 at 1-1 and 1-2 (Xcel Energy Proposal).
[67] Ex. 1 at 1-3 to 1-4 (Xcel Energy Proposal); Ex. 46 at 11 (Wishart Direct); Ex. 49 at 2 (Alders Direct).
[68] Ex. 1 at 1-1 (Xcel Energy Proposal).
[69] Ex. 1 at 1-11 (Xcel Energy Proposal).
[70] *Id.*
[71] *Id.*
[72] Ex. 1 at 1-11 (Xcel Energy Proposal).
[73] Ex. 1 at 1-10 (Xcel Energy Proposal); Ex. 46 at 12 (Wishart Direct).
[74] Ex. 1 at 1-13 (Xcel Energy Proposal).

72. ~~65.~~ The output of Black Dog Unit 6 depends upon ambient weather conditions (primarily temperature and humidity) and altitude. Nominal generating capacity will be approximately ~~215~~ 208 MW at summer ambient conditions of 95 degrees Fahrenheit and relative humidity of 30 percent, with an altitude of 720 feet above sea level.[75]

73. ~~66.~~ Black Dog 6 would operate as a peaking generator, with an anticipated annual capacity factor of four to ten percent. The annual availability of Black Dog 6 would be greater than 95 percent, and its service life is expected to exceed 35 years.[76]

74. ~~67.~~ Xcel proposes to construct Unit 6 in 2016 and 2017. Under its proposal, decommissioning, demolition and removal of the existing Unit 4 turbine, generator, boiler and related equipment would begin in the fall of 2014.[77]

75. ~~68.~~ Xcel anticipates that the construction of its Black Dog combustion turbine unit would require 21 months.[78]

76. ~~69.~~ Xcel's proposed Red River Valley Units 1 and 2 would be located near the community of Hankinson, North Dakota, near the existing 230 kV transmission system and major natural gas pipeline routes. This plant would utilize less than 35 acres of a larger 160-acre parcel that Xcel plans to acquire. The undeveloped portions of the site would buffer the plant from surrounding uses. The Hankinson site is located within a rural setting with low residential densities.[79]

77. ~~70.~~ Xcel proposes to place the Red River Valley Unit 1 combustion turbine and associated natural gas, transmission, and interconnection facilities into service in 2018. It proposes to add Red River Valley Unit 2 to the plant site after the first Red River Valley combustion turbine and place this second unit into service in 2019.[80]

78. ~~71.~~ Alternatively, Xcel asserts that it could deploy the Red River Valley turbines together in either 2018 or 2019. It notes that this later, simultaneous deployment could result in economies of scale and cost savings.[81]

79. ~~72.~~ The tallest structure on the Red River site would be the stack, standing at approximately 65 feet tall. Xcel projects that the tanks, combustion turbine, and maintenance and operations building will be less than 40 feet in height.[82]

80. ~~73.~~ The combustion turbine facility would utilize natural gas. A short gas pipeline would be necessary to connect the plant to the fuel supplier.[83]

81. ~~74.~~ Xcel's assessment is that the Alliance pipeline has adequate capacity to serve Red River Valley units, and that the fuel would be available with high reliability.[84]

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[75] Ex. 1 at 4-6 (Xcel Energy Proposal); Ex. 46 at 12 (Wishart Direct).
[76] Ex. 42 at 3 (Ford Direct).
[77] Ex. 1 at 1-11 (Xcel Energy Proposal).
[78] Ex. 38 at 6 (Environmental Report).
[79] Ex. 1 at 1-11, 1-12 and 1-13 (Xcel Energy Proposal).
[80] Ex. 1 at 1-2 (Xcel Energy Proposal).
[81] Ex. 1 at 1-2 and 1-12 (Xcel Energy Proposal).
[82] Ex. 1 at 1-12 (Xcel Energy Proposal).
[83] *Id.*
[84] Ex. 46 at 13 (Wishart Direct).

82. ~~75.~~ Red River Valley Units 1 and 2 would connect to a new 230 kV substation with a short double circuit 230 kV line. The system interconnection will require an upgrade of the existing Hankinson – Wahpeton 230 kV line.[85]

83. ~~76.~~ Xcel likewise proposes Model F combustion turbines for the Red River Valley Units.[86]

84. ~~77.~~ The units would be integrated into Xcel's remote dispatch control center. Xcel would use the units for peaking service, dispatching them after all incrementally lower-cost units. The units would be primarily dispatched during higher system load periods in the summer and winter months, during peak demand period, with annual capacity factors between four and ten percent.[87]

85. ~~78.~~ The output of the Red River Units depends upon ambient weather conditions. Nominal generating capacity is considered about ~~214~~208 MW at summer ambient conditions of 88 degrees Fahrenheit and relative humidity of 42 percent with an altitude of 900 feet above sea level.[88]

86. ~~79.~~ The combustion turbines would utilize natural gas as their fuel. The facility allows for the addition of distillate oil storage and handling if a future need develops to have oil as the backup fuel. Xcel anticipates securing the necessary natural gas supply through a competitive process beginning in 2014.[89]

87. ~~80.~~ Xcel plans to obtain the water that is needed for the Red River units from either an on-site well or truck shipments.[90]

88. ~~81.~~ The Red River Valley Units would place generation closer to Xcel's Fargo load center, and would moderate Xcel's reliance on the high voltage transmission system to deliver energy to this part of its system.[91]

89. ~~82.~~ Xcel proposed the establishment of a rider similar to one that the Commission approved for the Minnesota Metro Emissions Reduction Project (MERP). It proposed that a rate rider be established for each unit in its proposal that is selected by the Commission. Xcel further proposed that each unit's return on equity (ROE) be adjusted – either upwards or downwards – to reflect any difference between the estimated capital cost and the actual cost of constructing the unit. The rider, with adjusted ROE, would be used during the first five years of rate recovery. After that time, Xcel proposed that the last authorized ROE would be used until the projects are included in base rates. Xcel also proposed different adjustments to the Company's ROE based upon the percentage difference of actual costs compared to estimated costs used to evaluate Xcel's proposal.[92]

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[85] Ex. 1 at 1-12 and 4-11 (Xcel Energy Proposal).
[86] Ex. 1 at 1-10 (Xcel Energy Proposal).
[87] Ex. 1 at 1-12 (Xcel Energy Proposal).
[88] Ex. 1 at 4-9 (Xcel Energy Proposal); Ex.46 at 12 (Wishart Direct).
[89] Ex. 1 at 4-9 (Xcel Energy Proposal).
[90] *Id.*
[91] Ex. 42 at 4 (Ford Direct).
[92] Ex. 49 at 1, 2 and 5 (Alders Direct); Hearing Transcript, Vol. 1 at 136-137.

VI. Features of the Proposal Submitted by Calpine

90. ~~83.~~ Calpine proposed to construct a 345 MW combined cycle gas plant at its existing Mankato Energy Center (the "Mankato facility") to match the identified need.[93]

91. ~~84.~~ Calpine proposed to supply 345 MW of the estimated 500 MW of Xcel's forecasted energy needs. Calpine proposes to expand its Mankato Energy Center in the city of Mankato, Minnesota, through the addition of one natural-gas-fired combustion turbine generator, an additional heat recovery steam generator, and related ancillary equipment.[94]

92. ~~85.~~ The Mankato Expansion would increase the Center's energy output by adding 290 MW of intermediate combined-cycle capacity and 55 MW of peaking capacity.[95]

93. ~~86.~~ The existing Mankato Energy Center consists of a 375 MW natural gas fired, combined cycle plant with one Siemens 501FD combustion turbine generator, one Nooter/Erikson heat recovery steam generator, a Toshiba TCDF 40L steam turbine generator, and other ancillary equipment.[96]

94. ~~87.~~ The Mankato Expansion would complete a two-phase project – that was earlier approved by the Commission – for a 720 MW power plant. The first phase of this project was placed into service in 2006. The proposed expansion would be the second phase and completion of the originally-designed project.[97]

95. ~~88.~~ Because the project would be located entirely on the Mankato Energy Center's existing 25-acre site, it utilizes a brownfield <u>site</u> that is now used for electric power generation.[98]

96. ~~89.~~ Natural gas is provided to the Mankato Energy Center through a 20-inch gas pipeline that interconnects with Northern Natural Gas' interstate pipeline facilities. This existing pipeline lateral is sufficiently sized to accommodate the future requirements of this expansion. The project would also use the existing plant's transmission outlets and interconnections to Xcel's Mankato substation. The existing plant switchyard and adjacent substation are appropriately sized for the incremental plant output.[99]

97. ~~90.~~ The Mankato Energy Center uses treated wastewater for processing and cooling. Discharges of water from the plant are routed to the city of Mankato's treatment plant. This allows the city of Mankato to manage more effectively the quality of its water discharge.[100]

98. ~~91.~~ The Mankato Expansion has strong local support and would provide both near-term and long-term local economic benefits through construction jobs, tax revenues to the city of Mankato, and revenues for the city of Mankato water department.[101]

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[93] *See* Ex. 8 (Calpine's Proposal).
[94] Ex. 8 at 2 (Calpine's Proposal).
[95] *Id.*
[96] Ex. 55 at 6 (Thornton Direct).
[97] Ex. 8 at 3 (Calpine's Proposal).
[98] Ex. 8 at 6 (Calpine's Proposal); Ex. 55 at 8 (Thornton Direct).
[99] Ex. 55 at 8-9 (Thornton Direct).
[100] Ex. 8 at 6 (Calpine's Proposal).
[101] Ex. 8 at 6 (Calpine's Proposal).

99. ~~92.~~ Combined cycle plants are typically defined as intermediate generation which has higher expected annual capacity factors. These types of units are more efficient than peaking facilities, but generally have higher construction, operation and maintenance costs.[102]

100. ~~93.~~ The Mankato facility's combined cycle unit would operate as an intermediate type resource with capacity factors in the 20 to 30 percent range.[103]

101. ~~94.~~ By utilizing existing gas, generating and transmission infrastructure, Calpine asserts that the Mankato Expansion avoids proliferation of generating sites and transmission corridors.[104]

102. ~~95.~~ The combined cycle power plant provides comparatively "fast start" capabilities and "start-stop" scheduling flexibility.[105]

103. ~~96.~~ Calpine asserts that these features make a combined cycle resource the most appropriate addition to Xcel's growing portfolio of intermittent power resources.[106]

104. ~~97.~~ Calpine projects that it could place the Mankato Expansion into service by June 1, 2017.[107]

VII. Features of the Proposal Submitted by Geronimo

105. ~~98.~~ Geronimo proposes to develop 130 MW of direct current (DC) nameplate capacity – equivalent to 100 MW of alternating current – of distributed solar energy from within Xcel's Upper Midwest service territory.[108] Geronimo explained that the estimated production of its facility is expected to decrease over time due to degradation of the plant equipment.[109]

106. ~~99.~~ The project consists of distributed photovoltaic power plants that would be located at approximately 20 sites serving Xcel loads within MISO Planning Resource Zone 1.[110]

107. ~~100.~~ The distributed solar facilities range in size from 2 MW to 10 MW and would utilize a linear axis tracker to increase the accredited capacity of the systems. The tracking system adjusts the tilt of each array such that the rays of sun remain perpendicular to the solar panels in at least one dimension throughout the day. With these additions the accreditation of the unit rises to 71.20 percent.[111]

[102] Ex. 46 at 16 (Wishart Direct).
[103] Ex. 46 at 17 (Wishart Direct).
[104] Ex. 8 at 6 (Calpine's Proposal).
[105] Ex. 8 - Appendix A at 2; Ex. 55 at 11 (Thornton Direct).
[106] *See,* Ex. 55 at 2 (Thornton Direct).
[107] Ex. 8 at 4 (Calpine's Proposal).
[108] Ex. 13 at 1 (Geronimo Proposal); Ex. 57 at 3 (Engelking Direct); Ex. 61 at 3 (Beach Rebuttal).
[109] Ex. 83 at 8 (Rakow Direct).
[110] Ex. 13 at 12 (Geronimo Proposal); Ex. 57 at 3 (Engelking Direct); Ex. 62 at 6-7 (Skarbakka Direct).
[111] Ex. 13 at 4 (Geronimo Proposal); Ex. 57 at 3 (Engelking Direct).

108. ~~101.~~ Geronimo sized the solar facilities to offset approximately 20 percent of the existing load at each respective substation. Further, by locating the solar facilities in close proximity to existing substations, the project would be able to make efficient use of existing transmission facilities. Each substation zone ranges in size from 20 to 70 acres and include design features which limit environmental impacts.[112]

109. ~~102.~~ Geronimo asserts that distributed solar facilities greatly reduce the impact of individual transmission equipment failures and limitations. Outages of individual transmission lines, distribution lines, or a solar facility component will, in nearly all cases, reduce the output from only a single solar facility. In such circumstances, the remainder of the project continues to be operational.[113]

110. ~~103.~~ Similarly, disbursement of Geronimo's units increases the reliability, and reduces the variability of, energy output from the proposed project.[114]

111. ~~104.~~ The project would generate energy without significant air emissions.[115]

112. ~~105.~~ The solar project has no associated fuel costs, and, therefore, provides for a fixed and certain price for the life of the project.[116]

113. ~~106.~~ Geronimo's facilities can be interconnected at the distribution system, allowing for fewer line losses and greater reliability.[117]

114. ~~107.~~ The project's estimated average annual availability is in excess of 97 percent. The expected service life of the proposed facilities is 25 to 40 years. The minimum specifications for the solar module production warranty are 90 percent of nameplate capacity at year 10 and 80 percent of nameplate capacity at year 25.[118]

115. ~~108.~~ As a non-wind variable generation resource, the proposal would provide Xcel with 71 MW of accredited capacity to meet its peak capacity obligation in the MISO Planning Reserve Sharing Pool and up to 200,000 MWh of primarily on-peak energy each year.[119]

116. ~~109.~~ The project would also provide Renewable Energy Credits (RECs) that Xcel can use to meet Renewable Energy Standards or a specific solar requirement in the states it serves.[120]

117. ~~110.~~ Geronimo has proposed an in-service date of December 2016 so as to meet Xcel's energy needs between 2017 and 2019.[121]

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[112] Ex. 13 at 4 (Geronimo Proposal).
[113] Ex. 13 at 26 (Geronimo Proposal); Ex. 60 at 5 (Beach Direct); Ex. 62 at 4 (Skarbakka Direct).
[114] *Id.*
[115] Ex. 13 at 24 (Geronimo Proposal); Ex. 57 at 5 (Engelking Direct).
[116] Ex. 13 at 19 (Geronimo Proposal); Ex. 57 at 5 (Engelking Direct).
[117] Ex. 57 at 5 (Engelking Direct).
[118] Ex. 13 at 16 (Geronimo Proposal).
[119] Ex. 13 at 1 (Geronimo Proposal); Ex. 57 at 2 (Engelking Direct).
[120] Ex. 13 at 1 (Geronimo Proposal).
[121] Ex. 13 at 26 (Geronimo Proposal); Ex. 57 at 3 (Engelking Direct).

118. ~~111.~~ Xcel estimated that the Geronimo project would fulfill approximately one-third of Xcel's solar energy requirements – namely, to provide 1.5 percent of its retail sales from solar energy sources – four years before the 2020 compliance date.[122]

119. ~~112.~~ Xcel could likewise market the Solar Renewable Energy Credits (S-RECs) to other utilities that need to meet solar-specific requirements in other states, but only to the extent that Xcel does not use the S-RECs to comply with a Renewable Energy Standard.[123]

120. ~~113.~~ The project's primary components are a nominal 300 watt photovoltaic module mounted on a linear axis tracking system and a centralized inverter(s).[124]

121. ~~114.~~ The tracking system foundations would utilize a driver pier and do not require concrete. The remainder of the plants includes electrical cables, conduit, step up transformers and metering equipment. The solar facilities would be fenced and seeded in a low growth seed mix to reduce run-off and improve water quality.[125]

122. ~~115.~~ Geronimo submitted two different pricing proposals. The first includes a fixed monthly payment per kilowatt (kW) for capacity and an energy payment for all energy generated by the project. The second pricing proposal is an energy-only payment that bundles all capacity, energy and environmental attributes into a dollars per megawatt hour price.[126]

123. ~~116.~~ Geronimo's proposed Purchase Power Agreement has a defined price over its twenty-year term.[127]

124. ~~117.~~ Under both pricing scenarios, Geronimo bears all of the interconnection and network upgrade costs associated with the project.[128]

125. Some of Geronimo's proposed facilities will interconnect at Xcel distribution feeders or substations, while other facilities will interconnect to Xcel transmission substations.[129]

126. Regardless of whether its proposed facilities interconnect to the distribution or transmission system, Geronimo states that Xcel will incur no additional transmission costs.[130]

VIII. Features of the Proposal Submitted by Great River Energy

127. ~~118.~~ Great River Energy's proposal offered accredited capacity from its generation assets to meet a portion of Xcel's need.[131]

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[122] Ex. 46 at 18 (Wishart Direct).
[123] Ex. 13 at 1 (Geronimo Proposal).
[124] Ex. 13 at 4 (Geronimo Proposal).
[125] *Id.*
[126] Ex. 57 at 5 (Engelking Direct).
[127] Ex. 13 at 19 (Distributed Solar Energy Proposal).
[128] Ex. 62 at 10-11 (Skarbakka Direct).
[129] Ex. 13 at 26 (Geronimo Proposal).
[130] Ex. 13 at 26 (Geronimo Proposal).
[131] Ex. 19 at 1 (GRE Proposal); Ex. 63 at 2-3 (Selander Direct).

128. ~~119.~~ Great River Energy proposes to sell Xcel MISO Zone 1 Resource Credits within the 2017 - 2019 timeframe. Additionally, GRE signaled its willingness to make a sale of credits in any or all of the three years covered by its proposal.[132]

129. ~~120.~~ GRE's generators are dispatched by MISO. The operation of these generators is not dependent upon the outcome in this Docket.[133]

130. ~~121.~~ This proposal could provide an alternative to building new generation resources in the near-term.[134]

131. ~~122.~~ A sale of existing credits results in no net increase in overall emission levels, externality costs or incremental environmental impacts associated with GRE's proposal.[135]

IX. Features of the Proposal Submitted by Invenergy

132. ~~123.~~ Invenergy proposes three 179 MW combustion turbine natural gas plants, including a 179 MW plant in Cannon Falls, MN, and two 179 MW plants near Hampton in Dakota County, Minnesota (the "Hampton Energy Center").[136]

133. ~~124.~~ Invenergy's Cannon Falls Energy Center commenced commercial operations in 2008. The Center consists of two simple cycle, dual fuel General Electric 7FA combustion turbines, providing 357 MW of peaking capacity. It receives natural gas through Greater Minnesota Transmission and Northern Natural Gas. Xcel purchases the output of the project under a long-term power purchase agreement reviewed and approved by this Commission.[137]

134. ~~125.~~ The Cannon Falls Energy Center has had a 96.9 percent Capacity Availability Factor over the last two years. After adjusting for planned outages, the Cannon Falls facility has shown a reliability of 99.2 percent since the 2008 commercial operation date.[138]

135. ~~126.~~ The proposed Expansion can be operational as early as January 1, 2016, with commercial operation beginning June 1, 2016, if needed, to meet Xcel's needs.[139]

136. ~~127.~~ Invenergy proposes to locate the Expansion on 9.3 acres of vacant land that is directly north of the existing Cannon Falls units in an area that is zoned for industrial uses.[140]

137. ~~128.~~ The Expansion would have minimal impacts to the surrounding area.[141]

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[132] Ex. 19 at 1 (GRE Proposal); Ex. 64 at 3 (Selander Rebuttal).
[133] Ex. 63 at 3 (Selander Direct); Ex. 64 at 4 (Selander Rebuttal).
[134] Ex. 19 at 1 (GRE Proposal).
[135] Ex. 38 at 12 and 57 (Environmental Report); Ex. 64 at 4-6 (Selander Rebuttal).
[136] Ex. 70 at 12 (Shield Direct).
[137] Ex. 24 at 7, 11 and 17 (Invenergy Proposal).
[138] Ex. 70 at 12 (Shield Direct).
[139] Ex. 70 - Attachment 1 at 4 and 8 (Shield Direct).
[140] Ex. 65 at 17 (Ewan Direct).
[141] Ex. 38 at 23 and 58 (DOC EERA Environmental Report); Ex. 65 at 18-19 (Ewan Direct).

138. ~~129.~~ The Expansion will require water for evaporative cooling on hot summer days and for emission controls when firing back-up fuel. The needed water resources can be supplied through the existing infrastructure. No surface water will be used as part of energy generation.[142]

139. ~~130.~~ As a peaking facility, the Expansion will operate a limited number of hours each year.[143]

140. ~~131.~~ Invenergy also proposes to develop the Hampton Energy Center in Dakota County, Minnesota, with the addition of two simple cycle, General Electric 7FA combustion turbine generators.[144]

141. ~~132.~~ The Hampton site is located approximately 20 miles southeast of the Minneapolis – St. Paul metropolitan area. The southeast area does not now have other Xcel generation resources nearby.[145]

142. ~~133.~~ The Hampton Energy Center would be installed on a 20-acre parcel north of Hampton, Minnesota. The parcel is located on 215th Street one quarter mile west of State Highway 52. This portion of Dakota County is a rural setting. There are four residences within one half mile of the proposed site.[146]

143. ~~134.~~ The site is adjacent to a new 345 kV electrical substation that is under construction. The proposed project would interconnect with the new substation.[147]

144. ~~135.~~ The tallest structure at the facility would be approximately 75 feet above grade. Invenergy proposes berms and landscaping to minimize visual impacts of the site's features.[148]

145. ~~136.~~ The Hampton proposal includes fuel oil as a back-up fuel. Invenergy proposes to include a 750,000 gallon fuel oil storage tank or similar design as the tank.[149]

146. ~~137.~~ The facility would require water for evaporative cooling on hot summery days and for emission controls when firing the back-up fuel. Two industrial wells would be drilled to supply the anticipated water needs for the facility. Any needed water treatment would be accomplished with temporary trailer base demineralizers or onsite equipment.[150]

147. ~~138.~~ The proposed combustion turbine could achieve minimum load within approximately 20 minutes of a "cold start" and full load within 30 minutes of such a start. Invenergy asserts that these features make its combustion cycle resource an appropriate addition to Xcel's growing portfolio of intermittent power resources.[151]

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[142] Ex. 65 at 17 (Ewan Direct); Ex. 38 at 17-18 (DOC EERA Environmental Report).
[143] Ex. 38 at 37 (DOC EERA Environmental Report).
[144] Ex. 26 at 4 (Invenergy Hampton Proposal).
[145] *Id.*; Ex. 65 at 3 (Ewan Direct).
[146] Ex. 65 at 19-20 (Ewan Direct).
[147] *Id.*
[148] *Id.* at 19 (Ewan Direct).
[149] *Id.* at 7 (Ewan Direct).
[150] *Id.* at 19 (Ewan Direct).
[151] Ex. 65 at 7-8 (Ewan Direct).

148. ~~139.~~ Invenergy's proposal did not separately price additional transmission facilities that may be needed.[152]

149. ~~140.~~ The project would be interconnected to an existing natural gas pipeline of Greater Minnesota Gas, Inc., that runs less than one half mile from the proposed project site.[153]

150. ~~141.~~ Invenergy proposes to minimize the emissions from its facility through the use of dry low NOx burners, a water injection system to minimize NOx emissions when fuel oil is used and strict limitations on the use of the unit that operates on fuel oil.[154]

151. ~~142.~~ The project capacity would range from approximately 310 MW in the summer to 380 MW in the winter. Actual available capacity would be determined by temperature and relative humidity. The project would have a Net Capability of 357 MW at the point of interconnection.[155]

152. ~~143.~~ The project is scheduled to be in operation as early as January 1, 2016, but no later than January 1, 2017.[156]

153. ~~144.~~ Invenergy offered identical pricing for either a June 1, 2016 or a June 1, 2017 commercial operation date, thereby providing additional flexibility to Xcel. In addition, Invenergy offered in-service dates of June 1, 2018 and June 1, 2019.[157]

154. ~~145.~~ For the Expansion, Invenergy offered to enter into a fixed price PPA to be executed and in which Invenergy assumes the construction and operation cost risk associated with the Expansion.[158]

155. ~~146.~~ In response to Xcel's inclusion of a "replacement cost" assumption in its analysis of the Expansion, Invenergy also offered an additional power purchase agreement term giving Xcel the option to extend the PPA in five year increments at a reduced capacity price for up to three additional five year terms.[159]

156. ~~147.~~ Invenergy also offered in-service dates of June 1, 2018 and June 1, 2019 for the Hampton facilities. Further, as with its Expansion proposal, Invenergy offered to grant Xcel the option to extend the PPA in five year increments at a reduced capacity price for up to three additional five year terms.[160]

X. The Department's Proposed Corrections to Calpine's ~~Bid~~Proposed Inputs

157. ~~148.~~ The Department adjusted Calpine's ~~bid~~proposed modeling inputs to reflect a summer-time decrease in capacity. Many natural gas-fired units have a lower capacity in summer than in winter for accreditation and energy production purposes.[161]

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[152] *See,* Ex. 26 at 4 (Invenergy Hampton Proposal); Ex. 46 at 15 (Wishart Direct).
[153] Ex. 26 at 4-5 (Invenergy Hampton Proposal).
[154] Ex. 65 at 20 (Ewan Direct).
[155] Ex. 26 at 8-9 (Invenergy Hampton Proposal).
[156] Ex. 26 at 4 (Invenergy Hampton Proposal).
[157] Ex. 69 at 4 (Ewan Rebuttal); Trade Secret Ex. 87 attachment SR-R-9 at 3-4 (Rakow Rebuttal).
[158] See, Ex. 65 at 32 (Ewan Direct).
[159] Ex. 69 at 17 (Ewan Rebuttal).
[160] Ex. 69 at 4 and 17 (Ewan Rebuttal); Trade Secret Ex. 87 attachment SR-R-9 at 3-4 (Rakow Rebuttal).
[161] Ex. 83 at 7 (Rakow Direct).

158. ~~149.~~ Using Calpine's estimate of summer and winter capacities, and the rating factors from other recently-added generation units – including Blue Lake 7, Blue Lake 8, Angus Anson 4, and Calpine's existing unit at the Mankato Energy Center – the Department added a deration pattern for the proposed Calpine unit. Further, a summer-time capacity deration was included in the inputs of each offeror that proposed a thermal unit.[162]

159. ~~150.~~ Calpine's response to discovery included an updated cost estimate for facilities upgrades that would be necessary in the event that Calpine's proposal was selected. It estimated those costs in the range of "$650,000 to $1,500,000 with a final cost to be confirmed upon completion of the facilities study." The Department included facilities costs in its Strategist analysis. Specifically, Dr. Rakow levelized the $1.5 million cost using the most recent levelized annual revenue requirement (LARR) data available – a revenue requirement amount of 12.17 percent. With this adjustment, the Department converted the proposed up-front capital costs into a stream of level payments over a period of years. It concluded that the capital costs have a discounted present value of approximately $1.55 million.[163]

160. ~~151.~~ The $1.55 million cost was reasonably included in a post-model Present Value ~~Rate of Return~~of Revenue Requirements (PVRR) adjustment for all scenarios and contingencies evaluating Calpine's proposal.[164]

161. ~~152.~~ Calpine suggested no corrections to Dr. Rakow's inputs, but did suggest separate treatment for fixed operation costs, maintenance costs and start charges. Dr. Rakow explained that he could not find a way to adequately model start changes as a variable cost. Thus, the Department retained the inputs as presented by Calpine.[165]

XI. The Department's Proposed Corrections to Geronimo's ~~Bid~~Proposed Inputs

162. ~~153.~~ The Department's modeling assumed that if Geronimo's proposal was selected by the Commission, there would be no reduction in capacity, energy, and costs to meet the Solar Energy Standard (SES). ~~For the purposes of its evaluation of proposals, the Department assumed that the added value of Geronimo's proposal as a SES-qualifying generation source was zero.~~ However, the Department explained how to interpret its modeling results assuming an offsetting reduction in the capacity and energy to meet the SES.[166]

163. ~~154.~~ The Department asserts that it would not be appropriate to award a contract to a proposal that performs poorly for the identified need on the basis that the proposal might fill a need not specified in the original RFP ~~because Xcel's RFP did not call for SES-qualifying solutions, the value of this feature of Geronimo's proposal is zero~~.[167]

164. ~~155. Notwithstanding the valuation conferred by the Department, t~~The Solar Renewable Energy Credits (S-RECs) ~~do~~ would have a separate market value if sold, and this value is more than zero. S-RECs are sold in other states at prices between $13/S-REC to more than $200/S-REC.[168] However, Minnesota Statute §216B.1691, subd. 4 states that such credits

[162] *Id.*
[163] The 12.17 percent LARR is the most recent estimate available. DOC Ex. 83 at 7 (Rakow Direct).
[164] Ex. 83 at 7-8 (Rakow Direct).
[165] Ex. 83 at 6 (Rakow Direct).
[166] Ex. 83 at 8-11 (Rakow Direct); Hearing Transcript, Vol. 2 at 145.
[167] Ex. 83 at ~~10-11~~13 (Rakow Direct).
[168] Ex. 59 at 18-19 (Engelking Rebuttal).

can be used only once;[169] thus, a credit cannot be used to comply with the Minnesota RES and sold. Xcel expects to use the solar credits resulting from Geronimo's project to comply with its RES, rather than sell the credits.[170] Because a sale of the solar credits is required before Xcel could obtain revenue from the solar-value of Geronimo's project, it would not be appropriate to assume that Xcel or its ratepayers would obtain revenues from the sale of the credits.

165. ~~156.~~ If the S-RECs were sold by Xcel, ~~A~~at a price of $5 for each marketable S-REC, the Geronimo proposal will result in a PVSC reduction of $10 million~~ annually~~, without considering degrading performance. At a price of $20 for each marketable S-REC, the Geronimo proposal will result in a PVSC reduction of $38 million~~ annually~~.[171]

166. ~~157.~~ If Geronimo's proposal is selected by the Commission, Xcel will use the solar energy generated by the project to meet the requirements of Minnesota Solar Energy Standard.[172]

167. ~~158.~~ Expressing doubt as to the commercial maturity of solar projects, Dr. Rakow and the Department urge the Commission to host a follow-on procurement that is limited to solar energy generation sources.[173] Mr. Wishart stated Xcel's intention, in the near future, to issue a solar RFP. A solar RFP would enable all parties and the Commission to evaluate Geronimo's proposal in comparison to other solar projects. Xcel intends to work with the Commission, the Department, and interested parties on the solar acquisition plan.[174]

XII. The Department's Proposed Corrections to GRE's ~~Bid~~Proposed Inputs

168. ~~159.~~ GRE reported that the Department's proposed Strategist outputs contained an error in cost. Dr. Rakow compared the costs of the GRE proposal reported by Strategist to the cost contained in GRE's original proposal. Following this review he agreed that there had been a series of faulty inputs. The Department revised and updated the cost inputs.[175]

XIII. The Department's Proposed Corrections to Invenergy's ~~Bid~~Proposed Inputs

169. ~~160.~~ Invenergy suggested three corrections to the Department's Strategist analysis. First, the company noted that its Hampton Center proposal price was incorrect on the input spreadsheet and the Department corrected this input.[176]

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[169] The statute states:

> (a) To facilitate compliance with this section, the commission, by rule or order, shall establish by January 1, 2008, a program for tradable renewable energy credits for electricity generated by eligible energy technology. The credits must represent energy produced by an eligible energy technology, as defined in subdivision 1. Each kilowatt-hour of renewable energy credits must be treated the same as a kilowatt-hour of eligible energy technology generated or procured by an electric utility if it is produced by an eligible energy technology. The program must permit a credit to be used only once.

[170] Hearing Transcript, Vol. 1 at 137.

[171] Ex. 59 at 18-19 and Table 2 (Engelking Rebuttal).

[172] Hearing Transcript, Vol. 1 at 137.

[173] Ex. 83 at 12-13 (Rakow Direct).

[174] Ex. 46 at 36 (Wishart Direct).

[175] Ex. 83 at 14 (Rakow Direct).

[176] *Id.*

170. ~~161.~~ Second, Invenergy stated that the data sent by the Department assumed a \$4/MMBtu natural gas price, when, in fact, the natural gas costs used in the Strategist runs were above \$6/MMBtu. Although Invenergy was correct as to the discrepancy, the error did not impact Invenergy more than other bidders' proposals. This is because within the Department's model, the price of natural gas was a background assumption that permitted comparison of the inputs and outputs of all Bidders' proposals.[177]

171. ~~162.~~ Third, Invenergy was unable to replicate the emissions values developed by the Department. Dr. Rakow further reviewed the inputs for SO_2, NO_X, CO, and PM_{10} emissions for Invenergy's bids. He divided the emissions input provided for Xcel's Black Dog unit 6 by the emissions input provided by Xcel in its Strategist input worksheet. Moreover, he undertook a similar calculation with Invenergy's data. He then compared these sums to ratios derived from the Strategist outputs. The result was that the ratios were very close. For SO_2, the difference (ratio of bidder provided inputs to ratio of Strategist outputs) was about three percent; for NOx, PM_{10}, and CO the difference was about one percent.[178]

172. ~~163.~~ The Department determined that the differences were very close such that Strategist accurately reflected the inputs provided by Invenergy~~the bidders~~.[179]

XIV. The Department's Proposed Corrections to Xcel's ~~Bid~~Proposed Inputs

173. ~~164.~~ Xcel provided a spreadsheet that corrected the base year revenue requirements (capital cost) inputs for its proposals. Dr. Rakow revised Xcel's calculations for Black Dog Unit 6 assuming a 2018 in-service date as well as Black Dog Unit 6 assuming a 2019 in-service date. He then used the revised results for the base year revenue requirements for Black Dog Unit 6 and Red River Units 1 and 2.[180]

XV. Strategist Model and the Forecasts of Future Needs

174. ~~165.~~ On behalf of the Department, Dr. Rakow conducted a series of analyses using Strategist modeling software. Strategist is a "capacity expansion model." It determines the set of resources that are the least cost method to meet increases in demand in the future.[181]

175. ~~166.~~ The Department's Strategist analysis began with inputs from Xcel's fall 2011 sales forecast.[182]

176. ~~167.~~ Since 2011, however, Xcel has produced additional forecasts; including its spring 2013 forecast.[183]

177. ~~168.~~ In its untested spring 2013 forecast, Xcel predicts that its customers will use less energy and capacity in the initial years compared to the fall 2011 forecast. In future years, Xcel predicts that customers will continue to use less energy while making higher demands on Xcel's peak compared to the fall 2011 forecast.[184]

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177 *Id.*
178 *Id.*at 14-15.
179 *Id.*
180 *Id.*at 15.
181 *Id.* at 5 and 14, n.4.
182 Ex. 76 at 14 (Shah Direct).
183 *Id.* at 3-7.
184 *Id.* at 8-10.

178. ~~169.~~ Xcel forecasts a significant change (decrease) in the overall load factor of its system.[185] Xcel did not provide a reasonable basis or explanation for the predicted changes in that forecast.[186]

179. ~~170.~~ The Department has not verified the accuracy of Xcel's spring 2013 sales forecast. The Department identified concerns based on its limited review of the spring 2013 forecast.[187] In fact, the spring 2013 forecast was not been reviewed in detail by any party.[188] However, the Department's analysis does include sales levels that are even lower than Xcel's spring 2013 sales forecast.[189]

180. ~~171.~~ The Department included in its analysis different assumptions regarding the reserve ratio that is applied to the~~amount of capacity that is reserved to serve load during periods of~~ peak demand on the electrical system. On the Department's behalf, Dr. Rakow considered two different methods: the reserve ratio used by Xcel in its 2010 IRP and a new reserve ratio to be used by MISO for its peak.[190] This reserve ratio does not reflect the higher percentage reserve requirement that MISO presented in October, 2013.[191]

181. ~~172.~~ The new MISO method is likely to have a significant effect on the amount of reserve capacity that MISO may require of Xcel in future years. It is not known at this time what MISO's long-term reserve requirement will be;[192] moreover, it is difficult to predict how MISO's short-term reserve requirement will change over time. ~~This amount is likely to be much lower than the reserves required in 2011~~.

182. ~~173.~~ The Department is continuing to evaluate how MISO's changing methods may impact Minnesota's resource planning.[193] For example, the impact of the new reserve requirements on items such as the quantity of DSM requires further analysis. Decreases in DSM capability would serve to effectively increase the required reserve. Moreover, MISO indicated in October 2013 that the reserve requirement percent is expected to increase.[194]

183. ~~174. Xcel's~~ MISO's prior peak reliability method (also known as "non-coincident peak" method) refers to the reliability method used during the analysis of Xcel's last Commission-approved resource plan – the 2010 IRP. Under this method a 3.79 percent reserve ratio was added to Xcel's forecast of the Company's peak demand – the peak demand that is non-coincident with any other entity's peak. With this capacity target in mind, the Strategist modeling software added resources until Xcel had sufficient capacity to cover both the Company's peak demand forecast and the required reserves.[195]

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185 *Id*. at 10.
186 *Id*. at 9-11; Tr. V. 2 at 32-33 (Shah).
187 *Id*. At 7-13.
188 Ex. 76 at 4 and 7 (Shah Direct); Ex. 74 at 15, n.11 (Norman Rebuttal).
189 Hearing Transcript, Vol. 2 at 14 and 32-33; Ex. 76 at 7-13 (Shah Direct); Ex. 78 at 4 (Shah Rebuttal).
190 Ex. 83 at 22-25 (Rakow Direct).
191 Ex. 83 at 39 (Rakow Direct)
192 Ex. 46 at 10 (Wishart Direct); *see also*, Ex. 49 at 7 ~~8~~ (Alders Direct) ("the Midcontinent Independent System Operator's resource adequacy process is in flux")
193 Ex. 83~~*Id.*~~ at 23 n.11.
194 *Id.* at 24-25 and 39.
195 *Id*. at 22-23.

184. ~~175.~~ This was the method used by MISO for the June 2012 to May 2013 planning year. It is also the method used by Xcel in its most recent resource plan.[196]

185. ~~176.~~ The term "MISO coincident peak" refers to a new reliability method to be used by MISO for the June 2013 to May 2014 planning year. This reliability method requires that a 6.2 percent reserve ratio be added to Xcel's forecast of its demand at the time of (or coincident with) the MISO system peak.[197]

186. ~~177.~~ The new reliability method recognizes that the peak demand on Xcel's system may occur on different days, or at different hours on the same day, as the peak demand on the MISO system.[198]

187. ~~178.~~ The MISO coincident peak demand is determined by discounting the non-coincident peak demand (i.e. the utility's peak demand) by a diversity factor. For example, if Xcel's peak demand is 100x, but the demand on its system is only 90x at the time that the broader MISO system hits its peak, the diversity factor between the two systems would be the difference between 100 and 90: 10 percent.[199]

188. ~~179.~~ Due to the uncertainties discussed above, the Department is not able to accurately forecast the amount of reserves that will be required under the new MISO requirements. For instance, it is not clear which diversity factor should be applied to discount non-coincident peak demand. There are several different alternatives that one may apply. Likewise, it is not clear to what extent demand side management ~~(DSM)~~ measures will reduce Xcel's non-coincident peak demand. The amount of the hour-by-hour demand reduction from Xcel's Saver's Switch air conditioning interruption program, for example, can ~~reduce hour-by-hour demand for energy~~ vary by ~~approximately~~ more than 100 MW.[200]

189. ~~180.~~ The forecasted amount of Xcel's needs varies depending upon whether one uses the previous reliability calculation method or MISO's new method. Moreover, the difference in forecasts is substantial. When the new MISO method of calculating reserves is used, there is a reduction in net peak demand of between about 275 MW and 290 MW each year. This calculation does not take into account any changes in DSM capability or changes in MISO's short-term reserve requirement percentages.[201]

190. ~~181. Both the Department and Xcel only evaluated combinations of energy plants that produced 300 MW by 2019.~~ In the first round of Strategist analysis the Department evaluated 24 different combinations of forecasts, solar accreditation, required reserve ratios, and wind additions. This analysis resulted in a wide variety of capacity deficits. In the second round of Strategist analysis, under base case conditions the Department's model has a deficit of about 300 MW by 2019. However, the Department also used four different forecast contingencies, again presenting Strategist with a variety of capacity deficits. Xcel's Strategist analysis evaluated the proposals assuming a deficit of about 300 MW in 2019.[202]

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[196] *Id*. at 23.
[197] *Id*. at 22-23.
[198] *See generally, id*. at 23-24.
[199] *Id*. at 23 and n. 12.
[200] *Id*. at 24-25.
[201] *Id*.
[202] Ex. 46 at ~~25-27~~10-11 (Wishart Direct); Ex. 84 SR-3 and SR-4A (Rakow Direct Attachments)~~Ex. 83 at 26 (Rakow Direct); Ex. 86 at 3 (Rakow Rebuttal)~~.

191. ~~182.~~ The ~~identified~~ need identified by Xcel was just larger than Calpine's Mankato facility rated summer capacity of 278 MW.[203]

192. ~~183.~~ The minimum quantity in Xcel's modeling was also more than 11 times Xcel's most-recent projection of need for 2019 – 26 MW. Xcel most-recent projection of need uses the new MISO reserve method, but did not consider the need for offsetting changes in DSM capability and other factors that may increase Xcel's need for capacity.[204]

193. ~~184.~~ As configured by the Department and Xcel, a wholesale energy market was available, but not a wholesale capacity market. Thus, when the Strategist model identifies a shortfall in generation, even as small as 1 or 2 MW, the model selects the next full plant to meet the added need. The selection of an additional plant is undertaken even if the added plant capacity is many times the remaining shortfall. This treatment of capacity is consistent with long-standing Commission decisions regarding how to use the wholesale market in ensuring that utilities are able to provide reliable service.[205]

XVI. Strategist Base Case Development

194. ~~185.~~ To develop a ~~"no build" or~~ base case for Strategist the Department updated its most recent Strategist analysis of Xcel's system as follows:

a. Re-established Xcel's CT and combined cycle (CC) optional expansion units in the years 2027 and beyond;

b. Eliminated the optional wind expansion units.

c. Re-established Xcel's "hard wired" or "forced" wind expansion units for the years 2012 and beyond to ensure that the existing renewable energy standard (RES) is met in Strategist.

d. Established the new fuel and associated inflation rates required for Xcel's proposed North Dakota units.

e. Removed the Goodhue Wind unit from Xcel's generation portfolio because the wind farm will not be built.

f. Updated the inputs for the LS Power (Cottage Grove) combined cycle unit in accordance with Xcel's 2013 database, as provided in DOC Information Request No. 1.

g. Updated the inputs for Xcel's Prairie Island units, largely removing the capacity attributable to the extended power uprate (Docket No. E002/CN-08-509) per Xcel's 2013 database.

h. Updated the wholesale market price inputs per Xcel's 2013 database.

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203 Ex. 46 at 2 and 16 (Wishart Direct).
204 *Id. at* 10.
205 Hearing Transcript, Vol. 1 at 105; *see also,* Ex. 83 at 19~~16~~ (Rakow Direct).

i. Updated the retirement dates for Xcel's Black Dog units 3 and 4 and French Island unit 3 per Xcel's 2013 database.

j. Updated the in-service (repair) date for Xcel's French Island unit 3 per Xcel's 2013 database.

k. Added about 290 MW nameplate capacity, 200 MW accredited capacity, and 490 GWh of solar energy by 2020 to meet the SES.

l. Updated the externality values per the Commission's June 5, 2013 Notice of Updated Environmental Externality Values (Docket Nos. E999/CI-93-583 and E999/CI-00-1636).

m. Updated the heat rates for the nuclear and generic units per Xcel's 2013 database.

n. Updated the coal, nuclear, biomass, natural gas fuel costs for the existing units per Xcel's 2013 database.

o. Updated the natural gas fuel costs for generic expansion units per Xcel's 2013 database.

p. Updated the monthly pattern for natural gas per Xcel's 2013 database.

q. Updated the variable operations and maintenance costs for certain existing units per Xcel's 2013 database.

r. Updated the wholesale energy market costs per Xcel's 2013 database.[206]

195. ~~186.~~ Xcel's 2011 and 2013 databases have the same number of wind expansion units through 2019, after which the "2013 database" has one, two or three additional wind expansion units each year. Dr. Rakow concluded the small number of additional units, at that distance in the future, did not impact the overall analysis.[207]

XVII. Using Generic ~~Credits~~ Units to Equalize Proposals for Evaluation

196. ~~187.~~ To affect comparisons between proposals of very different sizes, the Department allowed Strategist to add~~ed~~ generic ~~energy~~ units to its modeling of particular bid packages so as to compare the ~~life-cycle~~ costs to Xcel's system of ~~a common~~ the various packages~~ across bidders~~. The price of a generic unit was provided by Xcel and was based upon the estimated current cost to construct a particular type of energy generation unit, escalated over time for inflation.[208]

197. ~~188.~~ In this case, Xcel used internal information that it had as to plant costs to develop a price for generic gas units.[209]

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[206] Ex. 83 at 17-19 (Rakow Direct); *see also,* Ex. 84 SR-2 (Rakow Direct Attachments); *Order Declining to Extend Certificate of Need, Finding Statutory Violation, Requiring Further Filings, and Giving Notice of Intent to Revoke Site Permit* in Docket Nos. IP6701/CN-09-1186, IP6701/WS-08-1233, IP6701/M-09- 1349, and IP6701/M-09-1350 (July 26, 2013).

[207] Ex. 83 at 17-18 (Rakow Direct).

[208] *See, e.g.,* Hearing Transcript, Vol. 1 at 109-110.

[209] Hearing Transcript, Vol. 1 at 110.

198. ~~189.~~ Xcel likewise developed a price for generic units of solar energy. In this instance, however, Xcel did not have internal cost or pricing information available. Instead, Xcel drew upon bidding information for solar projects in other jurisdictions and adjusted those figures "to reflect what we thought the cost in Minnesota specifically would be."[210]

199. ~~190.~~ Geronimo claimed that b~~B~~oth Xcel and the Department used the same base assumptions with respect to the cost of generic gas and solar units. However, while Xcel did apply a cost to the solar energy added to Strategist, the Department did not apply any cost to the solar energy added to Strategist. Instead the Department merely increased the energy production at existing units. No cost was appropriate since the energy production for the solar mandate is the same in each Strategist run.[211]

200. ~~191.~~ There are risks associated with adding generic units to proposals during the evaluation process. These risks are analyzed by running contingency analysis in Strategist assuming higher and lower capital costs.[212] Smaller proposals rely more upon generic units to account for the stated capacity needs than proposals with larger capacities. Accordingly, if the generic units are more expensive than an offeror's proposal price, adding these expensive units to the model works to the disadvantage of the smaller packages. Larger proposals will tend to look cheaper in a Strategist modeling of outcomes than smaller packages that include generic units.[213]

201. ~~192.~~ The generic gas unit price that Xcel developed was higher than the prices of the gas plants bid in this docket. As a result, each of the gas proposals bid in this proceeding was comparably less expensive than the generic units; a fact that benefited the gas proposals in proportion to their size during the Department's evaluation process (the larger the proposal the less it relies upon the more expensive generic units). Since Xcel locked-in the expansion plan in Strategist this issue did not impact Xcel's modeling.[214]

202. ~~193. The generic solar unit price that Xcel developed was lower than the prices of the solar plant bid in this docket. As a result,~~ Geronimo's proposal was ~~evaluated as comparably~~ more expensive than the generic units in the Department's modeling~~; a fact that disadvantaged its proposal during the evaluation process~~. Geronimo's proposal was also the smallest among the bids submitted. Therefore, Geronimo's proposal actually relied more upon the (lower cost) generic units and also benefitted. Again, since Xcel locked-in the expansion plan in Strategist this issue did not impact Xcel's modeling.[215]

XVIII. Evaluating Interconnection Costs and Savings

203. ~~194.~~ The Department reviewed the costs associated with interconnecting the proposed projects to the transmission system, including the potential for curtailment or congestion charges.[216]

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[210] *Id.*
[211] Ex. 59 (Engelking Rebuttal, Schedule EME-3); Hearing Transcript, Vol. 1 at 110; Ex. 83 at 19 (Rakow Direct).
[212] Ex. 83 at 36-37 (Rakow Direct).
[213] Ex. 83 at 29-32 and 37 (Rakow Direct).
[214] Ex. 46 at 36 (Wishart Direct); Ex. 83 at 30 (Rakow Direct).
[215] Ex. 46 at 36 (Wishart Direct); Ex. 59 (Engelking Rebuttal, Schedule EME-3); Ex. 83 at 30 (Rakow Direct); Hearing Transcript, Vol. 1 at 110.
[216] Hearing Transcript, Vol. 2 at 39 (Shaw).

204. ~~195.~~ Xcel stated that it does not expect any of the bid proposals to have significant congestion charges and, thus, the Department did not add congestion charges to its Strategist analysis.[217]

205. ~~196.~~ The offerors do treat interconnection costs, including potential network upgrade costs, in very different ways.[218]

206. ~~197.~~ Concerned that Xcel and Invenergy expected ratepayers to cover interconnection costs, the Department notified offerors that it would oppose efforts to recover from ratepayers costs that were not included in their respective proposals.[219]

207. ~~198.~~ Calpine responded to the Department's notice that its bid did not include MISO's estimated cost of necessary upgrades for its Mankato bid of $650,000 to $1,500,000 with "a final cost to be confirmed upon completion of the facilities study."[220]

208. ~~199.~~ Dr. Rakow included a $1,550,000 PVSC upgrade cost in the Strategist analysis for Calpine's Mankato proposal.[221]

209. ~~200.~~ Invenergy included $7 million for interconnection costs in its Cannon Falls proposal, but identified a formula to calculate increases or decreases to that amount.[222]

210. ~~201.~~ Invenergy failed to show the reasonableness of its suggestion that unknown costs be shifted to ratepayers following the Commission's selection of proposals.[223]

211. ~~202.~~ Xcel proposes to pass extra costs on to ratepayers through a rider to its tariff.[224]

212. ~~203.~~ To the extent that Xcel's proposal permits it to avoid submitting firm pricing for interconnection costs, it is prejudicial to ratepayers and other offerors.[225]

213. ~~204.~~ By locating the distributed sites in close proximity to load centers, Geronimo's proposal will reduce transmission line losses that occur whenever energy is transmitted across the wires and transformers of an electric system.[226]

214. ~~205.~~ Based upon demand loss factors by voltage level, Geronimo indicates that its proposal will result in a four percent reduction in transmission line losses. Geronimo calculated that t~~T~~his reduction would result~~s~~ in a PVSC savings of approximately $9 million.[227]

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[217] Ex. 79 at 5 (Shaw Direct).
[218] *Id. at* 2-4.
[219] Ex. 79 at 2-4 (Shaw Direct); Ex. 82 at 4 (Shaw Rebuttal); Ex 83 at 7-8 (Rakow Direct).
[220] Ex. 79 at 4 (Shaw Direct).
[221] Ex. 83 at 7 (Rakow Direct).
[222] Ex. 79 at 3-4 (Shaw Direct).
[223] *Id.*
[224] Ex. 82 at 1-3 (Shaw Rebuttal).
[225] *Id.*
[226] Ex. 62 at 4 (Skarbakka Direct).
[227] Ex. 13 at 31 (Distributed Solar Energy Proposal); Ex. 61 at 7 (Beach Rebuttal).

215. ~~206.~~ Xcel would incur any costs associated with transmission losses through the differential in locational marginal prices (LMP) between a generator and its load (called congestions charges). Xcel provided the Department with an analysis of the LMP differential for all bids except for the Geronimo proposal; for Geronimo, Xcel stated that "The Company will be responsible for congestion charges associated with … any portion of the Geronimo Energy proposal that interconnects to the MISO transmission grid.[228] ~~acknowledges that, if accepted, Geronimo's proposal will result in a reduction in transmission losses and that those avoided transmission line losses are not captured in either Xcel's or the Department's models.~~ Xcel stated that Geronimo's proposal was not evaluated due to insufficient information on the locations of the various solar sites.[229] Based upon Xcel's data, the Department concluded that no adjustment to any of the bids was necessary.[230] A $9 million PVSC adjustment would not significantly change the Department's Strategist modeling results.[231]

216. ~~207.~~ By selecting sites that will be interconnected on the distribution system, Geronimo's dispatching of energy has the potential to reduce peak loading on Xcel's transmission system. To the extent Geronimo is able to interconnect at the distribution level, t~~T~~hese reductions may make existing transmission capacity available to meet future needs and permit Xcel to avoid costs to expand its transmission system.[232] However, Geronimo also proposed to interconnect some of its proposed facilities at Xcel's transmission system.[233]

217. ~~208.~~ Using MISO's rate for network integration service on Xcel's system, Geronimo calculated the avoided transmission capacity benefits associated with Geronimo's proposal ~~is~~ to be approximately $3.24 million each year beginning the first year Geronimo's proposal is in service.[234]

218. ~~209. Neither the Department nor Xcel evaluated the benefits of avoiding additional transmission capacity costs.~~The Department conducted analysis to ensure that all transmission-related concerns associated with each proposed project were properly considered.[235]

219. ~~210.~~ Geronimo further calculated that t~~T~~hese $3.24 million annual savings reduce the PVSC for Geronimo's project by $33 million. However, Geronimo was unable to demonstrate any need for Xcel's transmission system to be expanded in the areas its proposed project would be built. Therefore, potential savings, if any, are very speculative and no adjustment is proper.[236]

XIX. The Department's Strategist Analysis

220. ~~211.~~ Each Bidder completed the Strategist template data form that is available on Xcel's website and forwarded the completed templates to the Department. Then, Dr. Rakow

[228] Ex. 81 at CJS-5 at 4 (Shaw Direct Attachments).
[229] *Id.*
[230] ~~Ex. 46 at 35 (Wishart Direct)~~ Ex. 81 at CJS-5 at 8 (Shaw Direct Attachments); Ex. 79 at 5 (Shaw Direct).
[231] See Ex. 84 SR-4A, SR-5A, and SR-5B (Rakow Direct Attachments).
[232] *See,* Ex. 13 at 9-12 (Geronimo Proposal).
[233] Ex. 13 at 26 (Geronimo Proposal).
[234] Ex. 61 at 9-10 (Beach Rebuttal).
[235] ~~*Id. at 7.*~~Ex. 79 at 2-4 (Shaw Direct).
[236] *Id.*; Ex. 59 at 20 (Engelking Rebuttal).

either entered this data directly into Strategist or calculated the required inputs from the Strategist template data to complete a series of computer models.[237]

221. ~~212.~~ From the computer runs that he completed, Dr. Rakow downloaded data as to how each proposal performed. Dr. Rakow then sent each offeror the data corresponding to its proposal. With these disclosures, offerors were able to review how their proposed solutions performed – in terms of cost, fuel consumption, pollutants emitted, and other factors – under a variety of different conditions.[238]

222. ~~213.~~ Dr. Rakow's Strategist analyses included a series of capacity and performance assumptions. For example, in one instance, Dr. Rakow programmed Strategist to add 100 MW of short term capacity (forced into the supply mix during June, July, and August) in both 2015 and 2016. Through this limitation, Strategist assessed whether the packages covered the capacity deficits in the 2017 to 2020 time frame or whether additional long term capacity (from generic units) was needed.[239]

223. ~~214.~~ Additionally, Dr. Rakow analyzed proposal performance at different levels of forecasted need. For the "high forecast contingency," Dr. Rakow programmed Strategist to add 400 MW of short term capacity in 2015 and 500 MW in 2016. For the "mid-high forecast contingency," he obliged Strategist to add 100 MW of short term capacity in 2015 and 250 MW in 2016.[240]

224. ~~215.~~ During a "first round" of analyses, Dr. Rakow assessed all possible bid packages that were less than 700 MW in size. From this range of proposals, he created a "short list" of the bids or packages that, in his view, warranted more detailed economic analysis during a "second round" of analysis.[241]

225. ~~216.~~ From the results of the first round of its Strategist analysis, the Department selected seven packages for more detailed analysis:

1. BD617—Xcel's Black Dog Unit 6, with an in-service date of 2017; ~~and~~ CCC1—Calpine's Combined Cycle Mankato Energy Center expansion proposal;
2. ICT1—Invenergy Combustion Turbine proposal 1 (Cannon Falls);
3. GPV1—Geronimo Solar proposal, "bundled" pricing;
4. BD619, CCC1—Xcel's Black Dog Unit 6, with an in-service date of 2019 and Calpine's CC Mankato Energy Center expansion proposal;
5. ICT1, BD618—Invenergy Combustion Turbine proposal 1 (Cannon Falls) and Black Dog unit 6 in-service by 2018;
6. ICT1, CCC1—Invenergy Combustion Turbine proposal 1 (Cannon Falls) and Calpine's CC Mankato Energy Center expansion proposal; and

[237] Ex. 83 at 5 (Rakow Direct); *see also,* Department's May 3, 2013 Comments, CN-12-1240.
[238] Ex. 83 at 5-6 (Rakow Direct).
[239] Ex. 83 at 37 (Rakow Direct).
[240] *Id.* at 37-38.
[241] *Id.* at 5.

7. The Base Case—a no-build alternative.[242]

226. ~~217.~~ Dr. Rakow's first round of modeling revealed that Xcel's Black Dog CT unit and Calpine's CC unit (number 4 in the listing immediately above) was the highest ranked proposal under all 24 scenarios.[243]

227. ~~218.~~ Xcel also undertook analyses of proposals using Strategist modeling software. The Black Dog 6 unit was the lowest-cost resource of the proposals that Xcel reviewed and was a feature of each of the top 20 highest-rated plans in its modeling.[244]

228. ~~219.~~ Importantly, however, the Black Dog ~~6~~ Unit 6 combined with Calpine's CC unit is a large ~~unit~~ package. To broaden and deepen the Department's analyses, Dr. Rakow analyzed the effects of deploying smaller energy solutions (and covering the deficits for a shorter period of time) and adjusting the proposed in-service dates of energy generation sources.[245]

229. ~~220.~~ For the base case in a second round of analysis, the Department used: (a) Xcel's 2011 forecast of need; (b) a non-coincident peak reliability method; (c) the assumed acquisition 800 MW of wind; and (d) an accreditation factor for solar energy solutions of 72 percent.[246]

230. ~~221.~~ Against these assumptions, the Department tested a set of contingencies drawn from Xcel's most recent resource plan. The resulting list of contingencies for the second round included:

- a statutory mandate on CO_2 reduction;
- use of the Commission's high and low CO_2 internal cost values;
- low externality values;
- high and low wholesale market prices (±25 percent);
- high and low capital costs (±10 percent);
- high and low coal costs (±20 percent and ±10 percent);
- low natural gas costs (-\$1.50, -\$1.00, -\$0.50);
- high natural gas costs (+\$2.50, +\$2.00, +\$1.50 + \$1.00, and, +\$0.50);
- high and low wind accreditation (±25 percent); and
- high and low forecast of energy and demand (±5 percent and ±2.5 percent).[247]

231. ~~222.~~ Additionally, the Department ran each scenario and contingency a second time with the Commission's CO_2 internal cost and externality values removed.[248]

[242] *Id.* at 35.
[243] *Id.* at 34.
[244] Ex. 46 at 19 (Wishart Direct); Hearing Transcript, Vol. 1 at 124.
[245] Ex. 83 at 36-37 (Rakow Direct).
[246] *Id.* at 36.
[247] *Id.* at 36-37.
[248] *Id.* at 37.

232. ~~223.~~ Following a second round of analyses, Dr. Rakow's Strategist modeling gave the highest rating to Calpine's proposal when combined with Xcel's Black Dog Unit 6 (and a 2019 in-service date for the Black Dog unit). When combined, these units cover the capacity deficits through 2023; and, if demand is lower than was projected in 2011, perhaps much longer.[249]

233. ~~224.~~ During a "third round" of Strategist analyses, the Department included assumptions regarding interruptible natural gas supply and flexible in-service dates. The Department's earlier analyses had assumed the use of firm natural gas supplies for all offerors that proposed a thermal solution.[250]

234. ~~225.~~ Assuming use of a firm natural gas supply favored Calpine's Mankato project and Xcel's Black Dog Unit 6 and disfavored Invenergy's proposal.[251]

235. ~~226.~~ The results of the third round of Department analyses identified three top performing packages:

a. Calpine's Mankato proposal with Black Dog Unit 6,

b. Calpine's Mankato proposal with Invenergy's Cannon Falls proposal, and

c. Invenergy's Cannon Falls proposal with Xcel's Black Dog unit 6.[252]

236. ~~227.~~ If the Department assumed both flexible in-service dates and the use of interruptible gas supplies, the cost of Invenergy's Cannon Falls proposal was significantly reduced.[253]

237. ~~228.~~ The Department recommended that PPA negotiations include consideration of firm and interruptible gas supply as well as flexible in-service dates. It recommended that such negotiations be limited to Xcel, Calpine and Invenergy and that, based upon the results of these negotiations, two of three projects should be selected by the Commission.[254]

238. ~~229.~~ Dr. Rakow also concluded that Geronimo's solar energy proposal was "significantly below the top performing packages in terms of Strategist results."[255]

XX. Statutory and Regulatory Requirements for this Proceeding

239. ~~230.~~ While Minn. Stat. §216B.2422, subd. 5 authorizes a utility to "select resources to meet its projected energy demand through a bidding process approved or established by the Commission," and to exempt selected proposals from the requirement to obtain a Certificate of Need, the Commission has decided to condition its approval powers in this case. In part, this is because Xcel is both the public utility with a resource need and an offeror with a proposal of its own to meet that need. In this circumstance, the Commission

[249] Ex. 83 at 40 and 43 (Rakow Direct); Ex. 84 SR-5A (Rakow Direct Attachments).
[250] Ex. 86 at 4 (Rakow Rebuttal).
[251] *Id.* at 4-5.
[252] Ex. 86 at 12 (Rakow Rebuttal).
[253] Ex. 86 at 10-12 (Rakow Rebuttal); Ex. 88 at SR-R-11A (Rakow Rebuttal Attachments).
[254] Ex. 86 at 2, 15 and 21 (Rakow Rebuttal); Hearing Transcript, Vol. 2 at 50 (Rakow).
[255] Ex. 83 at 16 (Rakow Rebuttal).

decided that ~~it will compare competing proposals against the ordinary~~ the process tracks the framework of the Certificate of Need process under Minn. Stat. §216B.243~~criteria~~.[256]

240. ~~231.~~ Minn. Stat. § 216B.243 provides that in assessing need, the Commission shall evaluate:

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

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

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

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

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

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

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

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

(9) with respect to a high-voltage transmission line, the benefits of enhanced regional reliability, access, or deliverability to the extent these

(10) factors improve the robustness of the transmission system or lower costs for electric consumers in Minnesota;

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

[256] NOTICE AND ORDER FOR HEARING, OAH 8-2500-30760 at 5 (June 21, 2013); Minn. Stat. § 216B.243, subd. 5.

section 216B.2425 for any transmission facilities or upgrades identified under section 216B.2425, subdivision 7;

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

(13) if the applicant is proposing a nonrenewable generating plant, the applicant's assessment of the risk of environmental costs and regulation on that proposed facility over the expected useful life of the plant, including a proposed means of allocating costs associated with that risk.[257]

241. ~~232.~~ Minn. R. 7849.0120 summarizes the statutory criteria found in Minn. Stat. § 216B.243 as follows:

(A). ~~(F)~~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 … ;

(B). ~~(G)~~a more reasonable and prudent alternative to the proposed facility has not been demonstrated by a preponderance of the evidence on the record … ;

(C). ~~(H)~~by a preponderance of the evidence on the record, the proposed facility, or a suitable modification of the facility, will provide benefits to society in a manner compatible with protecting the natural and socioeconomic environments, including human health … ; and

(D). ~~(I)~~the record does not demonstrate that the design, construction, or operation of the proposed facility, or a suitable modification of the facility, will fail to comply with relevant policies, rules, and regulations of other state and federal agencies and local governments.[258]

242. ~~233.~~ Importantly, however, Minn. Stat. §§ 216B.2422, subd. 4 and 216B.243, subd. 3a, place~~s~~ a limitation on the Commission's powers to confer a certificate of need. The statutes provide~~s~~ that the Commission "shall not approve a . . . nonrenewable energy facility in an integrated resource plan or a certificate of need . . . unless the utility has demonstrated that a renewable energy facility is not in the public interest." and "may not issue a certificate of need under this section for a large energy facility that generates electric power by means of a nonrenewable energy source, … 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.[259]

243. ~~234.~~ Section 216B.2422, subd. 4 further provides that the determination of the public interest must include consideration of whether the resource plan helps the utility to achieve Minnesota's greenhouse gas reduction goals, renewable energy standard, or the solar

[257] Minn. Stat. § 216B.243, subd. 3.
[258] Minn. R. 7849.0120.
[259] Minn. Stat. § 216B.2422, subd. 4; *see also,* Minn. Stat. § 216B.243, subd. 3a.

energy standard.[260]

244. ~~235.~~ Minn. Stat. § 216B.2426 requires that the Commission ensure that "opportunities for the installation of distributed generation" are considered in resource planning and certificate of need proceedings.[261]

XXI. Impact upon Adequacy, Reliability or Efficiency of the Energy Supply

245. ~~236.~~ The first criterion under Minn. R. 7849.0120 is whether the proposed resource would have adverse effects upon the future adequacy, reliability, or efficiency of energy supply of the utility, its customers, or to the people of Minnesota and neighboring states.[262]

246. ~~237.~~ Xcel's needs for additional capacity have not been shown in this proceeding to require a change to the determination by the Commission that Xcel needs 150 MW of capacity by 2017 and up to 500 MW of capacity by 2019. Several factors were asserted to have a potential effect on Xcel's capacity needs, namely ~~are undergoing significant change because of~~ ~~three key factors~~: (1) Xcel's assertion of expected lower overall demand; (2) the addition of between 72 and 200 MW of accredited capacity from solar resources, needed by 2020 to meet Minnesota's Solar Energy Standard; and (3) new short-term reserve margin requirements issued by MISO.[263]

247. ~~238.~~ Taking into account ~~only~~ the first two factors – Xcel's assertion of lower overall demand and the new solar resource standard – along with less significant changes such as updated unit capacity ratings and forecast of load management Xcel projects that it will have a generating capacity shortfall of 93 MW in 2017. This shortfall might conceivably grow to 307 MW by 2019.[264] No party performed a detailed review of the spring 2013 forecast of lower overall demand. However, there is preliminary evidence that there may be problems with Xcel's lower demand forecast.[265] Nonetheless, the Department's analysis of the bids employed a forecast band wide enough to encompass Xcel's spring 2013 sales forecast.[266]

248. ~~239.~~ However, if MISO's reserve requirements are calculated on the basis of coincident peaks, as they are today, before consideration of the impact of changing the reserve requirement methodology on DSM resources and without regard to higher short-term reserve requirement percentages suggested by MISO, the projected deficit in generation capacity may be lower; there is uncertainty about the level of reserve requirements that will be in place over the long run ~~shrinks even further~~.[267] ~~If all three factors reducing the need for capacity are considered, Xcel does not face a shortfall of generation capacity until 2019. Moreover, this deficit grows only by 26 MW by 2019.~~

[260] Minn. Stat. § 216B.2422, subd. 4.
[261] Minn. Stat. § 216B.2426.
[262] Minn. R. 7849.0120 (A).
[263] Ex. 46 at 7-8 (Wishart Direct); Ex. 83 at 19 (Rakow Direct).
[264] Ex. 46 at 7-8 and Table 2 (Wishart Direct).
[265] Ex. 74 at 15 (Norman Rebuttal); Ex. 76 at 7-13 (Shah Direct).
[266] Ex. 76 at 13 (Shah Direct).
[267] Ex. 83 at 39 (Rakow Direct).

249. ~~240.~~ Generation from solar power sources is the greatest on sunny days during the summer. Xcel's peak demand for electricity most often occurs on sunny days during the summer. Solar power sources are accredited based upon performance during the hours ending 2 p.m., 3 p.m., and 4 p.m. regardless of when Xcel's peak demand occurs. Also, the new MISO reserve methodology is based upon the time of the MISO system peak demand rather than individual utility demand peaks.[268]

250. ~~241.~~ Geronimo's proposal includes features – such as tracking system technology, appropriately-sized modules, and distributed sites – to ensure that the project reliably delivers energy capacity.[269]

251. ~~242.~~ Geronimo proposes to generate energy from approximately 20 different locations across Xcel's service territory. These facilities will generate between 2 MW and 10 MW of electricity. Each site will be served by separate interconnection facilities.[270]

252. ~~243.~~ A distributed network of generation may reduce~~s~~ the ~~risk~~ impact of outages at any particular point of the transmission system but subjects the proposal to outages at a greater number of points on the transmission system.[271]

253. ~~244.~~ A distributed network of generation reduces transmission line losses. Geronimo calculated that t~~T~~his reduction results in a PVSC savings of approximately $9 million.[272] However, Geromino proposes to interconnect its facilities at both the distribution and transmission system.[273] In any case, no adjustment is necessary to any of the bids based on the LMP differentials which include transmission losses.[274]

254. ~~245.~~ Geronimo proposes an in-service date of December 2016, so as to ensure that its generation capacity would be available to meet any of Xcel's capacity needs in the summer of 2017. However, due to the expiration of tax credits, the in-service date of Geronimo's project could not be deferred if the Commission were to determine Xcel's capacity needs had been deferred.[275]

255. ~~246.~~ GRE proposes to sell capacity from its existing generators to Xcel.[276]

256. ~~247.~~ Those energy resources are fully integrated into the existing transmission system and dispatched by MISO within its energy market.[277]

257. ~~248.~~ Over the three-year period that includes 2017, 2018 and 2019, GRE's rebuttal testimony indicated that GRE's proposal is fully scalable. It will sell Xcel needed capacity for one, two or three years, as Xcel's reserve requirements become apparent.[278]

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268 Ex. 60 at 12-13 and 15-16 (Beach Direct); Ex. 83 at 22-23 (Rakow Direct).
269 Ex. 60 at 3-5 and 18-19 (Beach Direct); Ex. 62 at 4 (Skarbakka Direct).
270 Ex. 57 at 9 (Engelking Direct).
271 Ex. 62 at 3-4 (Skarbakka Direct).
272 Ex. 13 at 31 (Distributed Solar Energy Proposal); Ex. 61 at 7 (Beach Rebuttal).
273 Ex. 13 at 26 (Geronimo Proposal).
274 Ex. 81 at CJS-5 at 4-8 (Shaw Direct Attachments).
275 Ex. 57 at 7 (Engelking Direct).
276 Ex. 63 at 3 (Selander Direct).
277 Ex. 63 at 3 (Selander Direct).
278 Ex. 63 at 2-3 (Selander Direct); Ex. 64 at 3 (Selander Rebuttal).

However, as this information became available only in rebuttal testimony, this change to GRE's proposal was not offered at a time when it could be taken into account in any party's analysis.

258. ~~249.~~ Even with potential changes in factors suggested in this proceeding that may increase or decrease Xcel's near term capacity needs, it is important to ensure that Xcel is able to provide reliable electric service, as required by Minn. Stat. §216B.04. The most efficient solution in this circumstance is to require Calpine's Mankato natural gas project, Invenergy's Cannon Falls natural gas project, and Xcel's Black Dog Unit 6 natural gas project to continue in negotiations and report to the Commission in a timely manner; there is not a basis in this proceeding for all three projects to be chosen. Ratepayers must not be at risk for costs that are higher than bid or for benefits assumed in bids that do not materialize.[279] ~~select scalable projects that meet Xcel's near term shortfalls (as described in Table 4 of Mr. Wishart's Direct Testimony) and for the Commission to conduct a second procurement for needs which may occur after 2019~~.

259. ~~250.~~ It is not reasonable or efficient to procure insufficient capacity to cover a range of potential needs and hope that wholesale market capacity is available to cover any shortfalls~~one or more gas turbines when the projected needs through 2019 are modest – and may be getting smaller~~.[280]

XXII. The Most Reasonable and Prudent Alternative

260. ~~251.~~ The second criterion under Minn. R. 7849.0120 is whether a more reasonable and prudent alternative to the proposed facility has been demonstrated by a preponderance of the evidence on the record.[281]

261. ~~252.~~ Xcel asserts that the least-cost plan that includes the Geronimo proposal is a package that combines Invenergy's Cannon Falls Facility and the Geronimo proposal, with in-service dates for each in 2016, with Black Dog Unit 6 joining the group in 2019. Xcel calculates the PVSC for this combination as $34 million higher than its least-cost plan.[282] The Department's analysis shows that, using the (lower) spring 2013 forecast, 72 percent solar accreditation, 800 MW of wind, and (new) coincident peak reliability calculations Geronimo's proposal on its own appears as package number 118, meaning that 117 packages were lower cost, including costs of externalities. The Department demonstrated that the PVSC for this package is $100 million higher than the least cost package.

262. ~~253.~~ In this circumstance, the evidence and long-standing Commission precedent is that capacity expansion modeling~~a levelized cost of electricity (LCOE)~~ points to a better prediction of costs and impacts to ratepayers than a levelized cost of electricity (LCOE) analysis.[283]

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[279] Department Ex. 102 (Rakow Opening Statement); Tr.V.2 at 52 (Rakow) and Tr.V. 2 at 43 (Shaw).
[280] *Id.*
[281] Minn. R. 7849.0120 (B).
[282] Ex. 46 at 34-35 (Wishart Direct).
[283] Ex. 47 at 2-3 (Wishart Rebuttal)~~*See generally,* Ex. 52 at 7 (Hibbard Direct)~~.

263. ~~254.~~ LCOE represents the net present value of the expected annual costs – including variable and fixed operations and maintenance costs, capital costs and the return on investment – divided by annual generation over the term of the proposal. However, LCOE does not include any impacts on a utility's existing resources when another resource is added – such as avoided fuel costs, avoided variable costs, and avoided capacity costs of the existing facilities.[284]

~~255. When one accounts for avoided energy costs, avoided capacity costs, avoided transmission costs, the impact of emissions and the cost to Xcel from transmission line losses., the benefits of Geronimo's proposal amounts to a savings of $46 million of net present value of societal costs.[285]~~

264. ~~256.~~ Geronimo's proposal ~~likewise~~ may manages ~~future~~ certain risks but may create other risks. Because its facilities create energy from sunlight, Geronimo's solution poses no risk of higher fuel costs in the future.[286] However, given that only one solar firm submitted a bid, it is not possible to conclude that Xcel's ratepayers would be getting the best solar resources if the Solar Bid were approved in this proceeding.

265. ~~257.~~ On a system cost ~~per MWh~~ basis, a solar unit is also the highest ~~lowest~~ cost standalone resource.[287]

~~258. The most reasonable and prudent solution in this circumstance is to select scalable projects that meet Xcel's near-term shortfalls (as described in Table 4 of Mr. Wishart's Direct Testimony) and for the Commission to conduct a second procurement for needs which may occur after 2019~~.

266. ~~259.~~ Combining two of the following proposals: Xcel's Black Dog unit 6, Invenergy's Cannon Falls expansion, and Calpine's Mankato expansion ~~Geronimo's proposal with GRE's proposal~~, represents the most reasonable and prudent alternative to meet Xcel's near-term needs.[288]

267. ~~260.~~ It is not reasonable and prudent to procure resources that may not cover the known range of potential needs~~one or more gas turbines~~, when the projected needs through 2019 are subject to several uncertainties that may increase or decrease the need for resources ~~modest – and may be getting smaller~~.[289]

268. ~~261.~~ If gas turbines are needed to meet larger, forecasted needs ~~after 2019~~, these turbines cannot be counted on to be constructed and placed into service within 21 months of a need determination by the Commission.[290]

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[284] *Id.*~~Ex. 52 at 6 (Hibbard Direct).~~

[285] Ex. 13 at 31 (Distributed Solar Energy Proposal); Ex. 57~~9~~ at 18-19 (Engelking Direct); Ex. 59~~8~~ at 18 (Engelking Rebuttal); Ex. 61 at 7 (Beach Rebuttal).

[286] Ex. 13 at 19 (Distributed Solar Energy Proposal).

[287] *See,* Ex. 74 at 7 (Norman Rebuttal), referencing Dr. Rakow and Mr. Wishart's direct testimonies.

[288] *See,* Section XXII.

[289] *Id.*

[290] Ex. 38 at 6 (Environmental Report); *see also,* Ex. 70 attachment 1 at 8 (Shield Direct).

~~262. The Department's Strategist analysis does not lead to identification of a more reasonable alternative than acceptance of Geronimo's proposal particularly when it is combined with acceptance of GRE's capacity offer.~~

269. ~~263.~~ A reasonable and prudent purchaser of energy resources would not have assumed that the value of an SES-qualifying generation source was zero.[291] <u>However, all analyses assumed that Xcel would fully comply with Minnesota's SES by 2020.</u>[292] <u>Further, as indicated in Section XI above, Xcel cannot use the S-RECs to comply with Minnesota's SES and sell the S-RECs; as a result, the value of the credits is fully accounted for in the Department's analyses</u>.

270. ~~264.~~ A reasonable and prudent purchaser of energy resources would not have assumed that the value of avoiding transmission line losses was zero.[293] <u>Thus, the Department analyzed the transmission-related issues attributable to each proposal and ensured that all transmission costs were included in each bid</u>.[294]

271. ~~265.~~ A reasonable and prudent purchaser of energy resources, for Xcel's ~~stated~~ needs<u> determined by the Commission</u>~~,~~ would not have relied upon Xcel's Fall 2011 sales forecast alone.[295] <u>As a result, the Department not only relied upon Xcel's Fall 2011 sales forecast but also employed a forecast uncertainty band wide enough to encompass Xcel's more recent (spring 2013) forecasts.</u>[296]

272. ~~266.~~ A reasonable and prudent purchaser of energy resources, for Xcel's ~~stated~~ needs<u> determined by the Commission</u> would not have limited the evaluation to energy plants that produced 300 MW by 2019.[297] <u>Therefore, the Department analyzed combinations of plants less than 300 MW and analyzed all combinations of plants under deficits far smaller than 300 MW by 2019.</u>[298]

273. ~~267.~~ A reasonable and prudent purchaser of energy resources would not risk incurring project cancellation costs when other, reasonably-priced and scalable alternatives exist.[299] <u>However, since the magnitude of any cancellation costs has not been demonstrated, nor has it been determined that ratepayers would be liable for any such cancellation costs, it would not be reasonable to make long-term resource decisions based on a fact that has not been established.</u>

XXIII. Compatibility with Our Socioeconomic and Natural Environments

274. ~~268.~~ The third criterion under Minn. R. 7849.0120 is whether the proposed resource will provide benefits to society in a manner compatible with protecting the natural

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[291] *Compare,* Ex. 83 at 8-10 (Rakow Direct); Hearing Transcript, Vol. 1 at 145 <u>with</u> Ex. 59 at 18-19 (Engelking Rebuttal).

[292] <u>Ex. 83 at 9-13 (Rakow Direct)</u>

[293] *See generally,* Ex. 46 at 35 (Wishart Direct); Hearing Transcript, Vol. 2 at 45.

[294] <u>Ex. 81 at CJS-5 at 8 (Shaw Direct Attachments); Ex. 79 at 5 (Shaw Direct).</u>

[295] Hearing Transcript - Vol. 2 at 30.

[296] <u>Ex. 76 at 14 (Shah Direct).</u>

[297] *Compare*, Ex. 46 at 25-27 (Wishart Direct); Ex. 83 at 26 (Rakow Direct); Ex. 86 at 3 (Rakow Rebuttal); Hearing Transcript - Vol. 2 at 29-30 <u>with</u> Ex. 46 at 10 (Wishart Direct).

[298] <u>Ex. 84 SR-3 and SR-4A (Rakow Direct Attachments); Ex. 84 SR-5A (Rakow Direct Attachments).</u>

[299] *See generally,* Hearing Transcript, Vol. 1 at 126-27.

and socioeconomic environments, including human health.[300]

275. ~~269. Geronimo's~~ All of the proposals ~~will~~ would benefit society in ways that are consistent with the natural environment. ~~Importantly~~ For example, construction and operation of Geronimo's Proposal ~~will~~ would not generate carbon dioxide (CO_2) or "criteria pollutants."[301] As a result, the analyses in this proceeding were based on the Commission's approved externality values, at average, low and high values.[302]

276. ~~270.~~ Criteria pollutants include sulfur dioxide (SO_2), nitrogen dioxide (NO_2), carbon monoxide (CO), lead (Pb), and particulate matter (PM).[303] The Commission currently has externality values for each of the criteria pollutants.

277. ~~271.~~ Sulfur dioxide causes acid rain and human respiratory illness. Nitrogen oxides are greenhouse gases that cause ozone and related respiratory illnesses. Carbon monoxide is a colorless, toxic gas produced by incomplete burning of carbon-based fuels and reduces the blood's ability to provide sufficient oxygen to the body. Lead is a metal that is known to have adverse health impacts on the nervous system, kidney function, immune system, reproductive and developmental systems and the cardiovascular system. Inhalation of particulate matter causes and contributes to human respiratory illness.[304]

278. ~~272.~~ Geronimo's facilities will not produce emissions of hazardous air pollutants (HAPs) or volatile organic compounds (VOCs). Both HAPs and VOCs are known or suspected of causing cancer and other serious health effects.[305] However, because the Commission has not established externality values for HAPs and VOCs, the relative effects of these factors were not included in this proceeding.

279. ~~273.~~ Because Geronimo's facilities will not produce air emissions, Geronimo claims that their offsetting impacts will result in an annual reduction of 94,133 tons of CO_2, 115.98 tons of CO, 63.26 tons of NOx, 27.08 tons of PM_{10}, 3.44 tons of VOCs, and 10.48 tons of SO_2.[306] The value of any reduction in system emissions of CO_2, CO, NOx, PM_{10}, and SO_2 were taken into account in the system-based modeling of the Department and Xcel through use of the Commission's externality values.[307]

280. ~~274.~~ By contrast, each of the gas-powered turbines proposed in this proceeding produces criteria pollutants and CO_2 during the combustion of natural gas.[308] Again, the cost of any increase in system emissions of CO_2, CO, NOx, PM_{10}, and SO_2 were taken into account in the system-based modeling of the Department and Xcel through use of the Commission's externality values.[309]

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[300] Minn. R. 7849.0120 (C).
[301] Ex. 38 at 38 (Environmental Report).
[302] Ex. 83 at 18 (Rakow Direct).
[303] *Id. at* 34.
[304] *Id.*
[305] *Id.* at 39.
[306] Ex. 13 at 24 (Distributed Solar Energy Proposal).
[307] Ex. 83 at 19, 36 (Rakow Direct); Ex. 46 at 21-22 (Wishart Direct).
[308] ~~*Id.* at 2.~~ Ex. 13 at 24 (Distributed Solar Energy Proposal).
[309] Ex. 83 at 19, 36 (Rakow Direct); Ex. 46 at 21-22 (Wishart Direct).

281. ~~275.~~ Geronimo's proposed solution will have minimal impacts on the environment. Specifically, Geronimo's facilities will not require water for power generation or discharge wastewater containing heat and chemicals during their operation.[310] Xcel does not foresee any changes to the existing Groundwater Appropriations Permit due to the addition of Unit 6. Calpine anticipates that the current agreement with the city of Mankato provides more than sufficient water. Invenergy does not anticipate that any changes to the city of Cannon Fall's water system would be necessary to provide the additional increment of water.[311]

282. ~~276.~~ Geronimo's proposal will produce numerous socioeconomic benefits. In particular, the construction phase of Geronimo's project will include approximately 500 jobs, dispersed in work crews of between 13 and 40 members each. Construction of Xcel's Black Dog Expansion proposal is not anticipated to require more than 60 workers at any one time. Calpine anticipates that approximately 250 construction workers would be employed during the peak of construction activity. Invenergy estimates that approximately 100 construction workers during the peak of construction activity.[312] Further, operation and maintenance of ~~its~~ Geronimo's power generation facilities will require up to 10 permanent positions.[313] No new operations jobs are expected to be created with the Black Dog, Mankato, and Cannon Falls proposals.[314]

283. ~~277.~~ The wages and salaries from these jobs will contribute to the total personal income in the region and state.[315]

284. ~~278.~~ Project-related expenditures for materials, equipment, operating supplies and services will benefit businesses located in the host counties and the state. Additionally, for Geronimo's solar proposal landowners who host solar panels or other project facilities will receive annual land payments.[316]

285. ~~279.~~ Selection of Geronimo's proposal ~~will~~ would provide benefits to society in a manner compatible with protecting the natural and socioeconomic environments, including public health. Selection of the natural gas proposal similarly would provide benefits to society in a manner compatible with protecting the natural and socioeconomic environments, including public health.[317]

286. ~~280.~~ Since GRE's proposal would not provide Xcel energy production rights, GRE's emission levels will be the same whether it effects a sale of capacity credits to Xcel or not. Thus, Xcel's existing system would produce the required energy. These facts were taken into account in the Department's and Xcel's modeling.[318]

287. ~~281. If added capacity is needed beyond 71 MW,~~ It has not been shown that selection of GRE's proposal ~~will~~ would provide benefits to society in a manner compatible

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[310] ~~*Id.*~~ Ex. 13 at 23-25 and 32-33 (Distributed Solar Energy Proposal).
[311] Ex. 38 at 18-19 (Environmental Report).
[312] Ex. 38 at 30-31 (Environmental Report).
[313] *Id.* at 31-33.
[314] *Id.* at 29.
[315] Ex. 13 at 32-33 (Distributed Solar Energy Proposal).
[316] *Id.*
[317] *See,* Section XXIII.
[318] Ex. 63 at 3 (Selander Direct); Ex. 83 at 2 n. 1 (Rakow Direct); Ex. 46 at 19 (Wishart Direct).

with protecting the natural and socioeconomic environments, including public health.[319]

XXIV. Future Compliance with Applicable Law

288. ~~282.~~ The fourth criterion under Minn. R. 7849.0120 is whether the proposed resource will comply with relevant policies, rules, and regulations of other state and federal agencies and local governments.[320]

289. ~~283. Among the proposals in this proceeding, Geronimo's solution best supports~~ Minnesota~~'s~~ has enacted a goal to move to reduce greenhouse gas emissions across all emission- producing sectors. However, none of the proposals or packages of proposals analyzed in this proceeding enabled Xcel's system to meet Minnesota's goal ~~has committed itself~~ to move "to a level at least 15 percent below 2005 levels by 2015, to a level at least 30 percent below 2005 levels by 2025, and to a level at least 80 percent below 2005 levels by 2050." ~~Geronimo's project will not produce greenhouse gas emissions of its own, and (based on an average system mix needed to generate energy) avoids 94,133 tons of CO2 emissions each year.~~[321]

290. ~~284.~~ If the Commission selects Geronimo's proposal, Xcel will use the solar energy produced by the project to meet its requirements under the SES.[322]

291. ~~285.~~ Geronimo's project will provide approximately 200,000 MWh annually and will make an early and substantial step towards compliance with the new standards.[323] However, given the timing of this proceeding, this bidding process was not specified as obtaining projects to meet the SES and thus there were was only one solar bid, providing no competition of resources to meet the SES.

292. ~~286.~~ Power plants represent the single largest source of industrial greenhouse gas emissions in the United States and account for approximately 40 percent of all U.S. anthropogenic CO2 emissions.[324]

293. ~~287.~~ The EPA has proposed a Carbon Pollution Standard for New Power Plants. EPA's proposed standard would set uniform national limits on the amount of carbon pollution new power plants can emit. EPA's proposed standards apply to fossil-fuel-fired boilers, integrated gasification combined cycle (IGCC) units and stationary combined cycle turbine units that generate electricity for sale and are larger than 25 MW. The proposed standards would require covered units to achieve an emission rate of 1,000 pounds of CO_2 per megawatt hour.[325] Only Calpine's proposal qualifies as a fossil-fuel-fired boiler, integrated gasification combined cycle (IGCC) unit, or stationary combined cycle turbine unit.

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[319] *See,* Section XXIII.
[320] Minn. R. 7849.0120 (D).
[321] Minn. Stat. § 216H.02, subd. 1; Ex. 83 SR-5A (Rakow Direct Attachments)~~Ex. 13 at 24 (Distributed Solar Energy Proposal)~~.
[322] Ex. 46 at 18 (Wishart Direct); Hearing Transcript, Vol. 1 at 137:4-8.
[323] Ex. 57 at 8 (Engelking Direct).
[324] Table 2-1 from "Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2009," U.S. Environmental Protection Agency, EPA 430-R-11-005, April 2011.
[325] Standards of Performance for Greenhouse Gas Emissions for New Stationary Sources: Electric Utility Generating Units, 77 Fed. Reg. 22392 (April 13, 2012).

294. ~~288.~~ Because Geronimo's proposed facilities do not produce CO_2 emissions, they pose few risks of higher future costs from more intensive regulation of carbon pollution.[326] The benefits related to Geronimo's avoided CO_2 emissions are covered through the use of the Commission's approved costs of $9 to $34 for future CO_2 emissions. These values were used in the modeling of the Department and Xcel.[327]

295. ~~289. Among the proposals in this proceeding, Geronimo's solution represents the lowest risks of non-compliance with state and federal policies, rules, and regulations.~~ There is no evidence that any of the bidders will fail 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 projects.

Based on the foregoing Findings of Fact, the ~~Administrative Law Judge~~ Commission should make~~s~~ the following:

CONCLUSIONS OF LAW

1. The Administrative Law Judge and the Commission have jurisdiction over the subject matter of this hearing pursuant to Minn. Stat. §§ 14.50, 14.57 and 216B.2422, subd. 5.

2. The Commission provided appropriate public notice and all procedural requirements of law and rule have been fulfilled.

3. Under the competitive bidding process, it is the Commission's role to select the most reasonable~~,~~ and prudent resources to meet Xcel's need.

4. It is not clear ~~that there are significant~~ what the exact capacity needs on Xcel's system will be between 2014 and 2018.[328] However, the Commission approved a need of 150 MW by 2017 and up to 500 MW by 2019 in its March 5, 2013 Order in Xcel's Integrated Resource Plan (Docket E002/RP-10-825).

5. While Xcel's overall need for additional capacity is uncertain, ~~there~~ it is ~~no~~ ~~uncertainty regarding~~ clear that Xcel~~'s~~ will need to add solar energy resources to its system before 2020 under Minnesota's Solar Energy Standard.[329]

6. The record in this proceeding indicates that Geronimo's proposal, when properly analyzed under ~~either a LCOE or~~ Strategist modeling~~,~~ is not the lowest cost resource proposed. Considering that the Strategist modeling assumed that Xcel would fully meet Minnesota's SES by 2020 and the analyses reflected the avoided emissions benefits, the evidence in this proceeding demonstrates that the bidding process explored use of renewable energy and demonstrated that the alternative selected is less expensive (including environmental costs) than the power generated by Geronimo's proposal.[330]

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[326] Ex. 13 at 33-39 (Distributed Solar Energy Proposal).
[327] Ex. 83 at 36 and 40 (Rakow Direct); Ex 46 at 21-22 and 37 (Wishart Direct).
[328] *See,* Ex. 46 at Tables 2 and 4 (Wishart Direct); Ex. 76 at Figures 1 and 3 (Shah Direct).
[329] *See,* Hearing Transcript - Vol. 1 at 149-150; Ex. 76 at Figure 2 (Shah Direct).
[330] Ex. 83 at 10-11 and 35 (Rakow Direct); Ex. 84 at SR-4A and SR-5A (Rakow Direct Attachments); Ex. 46 at 25 and 33-36 (Wishart Direct).

7. The most efficient, reasonable and prudent solution in this circumstance is to select ~~scalable~~ the least cost projects that meet the range of Xcel's near-term shortfalls (as described in Tables 2 and 4 of Mr. Wishart's Direct Testimony) and for the Commission to require Xcel to initiate an all-solar bidding process as soon as possible ~~conduct a second procurement for needs which may occur after 2019~~.

~~8. The most reasonable and prudent solution in this circumstance is to select scalable projects that meet Xcel's near-term shortfalls (as described in Table 4 of Mr. Wishart's Direct Testimony) and for the Commission to conduct a second procurement for needs which may occur after 2019.~~

8. ~~9.~~ Combining two of the three least cost proposals into a package (as indicated by the Department and Xcel)—Xcel's Black Dog unit 6, Calpine's Mankato expansion, and Invenergy's Cannon Falls expansion) ~~Geronimo's proposal with GRE's proposal~~ represents the most reasonable and prudent alternative to meet Xcel's near-term needs.

9. ~~10.~~ Selection of ~~Geronimo's proposal~~ two of the three least cost proposals into a package (as indicated by the Department and Xcel)—Xcel's Black Dog unit 6, Calpine's Mankato expansion, and Invenergy's Cannon Falls expansion will provide benefits to society in a manner compatible with protecting the natural and socioeconomic environments, including public health.

~~11. If added capacity is needed beyond 71 MW, selection of GRE's proposal will provide benefits to society in a manner compatible with protecting the natural and socioeconomic environments, including public health.~~

~~12. Selection of Geronimo's proposal is in accord with Minnesota's preferences for low-emission, renewable and distributed generation.~~

10. ~~13. Among~~ There is no evidence that any of the proposals in this proceeding~~,~~ present a significant ~~Geronimo's solution represents the lowest~~ risks of non-compliance with state and federal policies, rules, and regulations.

11. ~~14.~~ Minn. Stat. § 216B.243, subd. 3(a) prohibits the Commission from issuing a certificate of need for an energy facility that uses nonrenewable fuels unless it can be demonstrated that: (a) the possibility of generating power by means of renewable energy resources was explored, and (b) selection of a renewable energy source to meet the stated need is not in the public interest.

12. ~~15.~~ While the facilities in question are exempt from the certificate of need statute, ~~T~~the hearing record ~~does not~~ establishes that selection of a nonrenewable energy source ~~to meet the first 71 MW of need~~ is in the public interest.

13. ~~16.~~ Selection of ~~Geronimo's proposal~~ two of the three least cost proposals as a single package—Xcel's Black Dog unit 6, Calpine's Mankato project, and Invenergy's Cannon Falls project furthers the public interest in a reliable, low cost electric system while protecting the socio-economic and natural environments.

14. ~~17.~~ The most reasonable way to ensure compliance with the SES is to require Xcel to issue an All-Solar RFP as soon as possible to obtain the overall best solar projects for meeting Xcel's obligations under Minnesota's recently enacted solar mandate.

~~18. If the Commission determines that more than 71 MW is needed in 2019, the decision to procure additional resources could safely be postponed until after Xcel's next resource planning process. Assuming a procurement decision is made in early 2017, a natural gas turbine could be constructed and placed into service by late 2018. Similarly, other renewable resources could be placed into service in that same timeframe.~~

15. ~~19. Based upon t~~The foregoing Conclusions support~~, and as detailed further in the Memorandum below, the Administrative Law Judge makes~~ the following:

RECOMMENDATION

IT IS RESPECTFULLY RECOMMENDED that the Commission:

16. ~~19.~~ Order that both the Calpine Mankato project and Invenergy Cannon Falls project proceed to PPA negotiations. ~~Select Geronimo's proposal~~.

17. ~~20.~~ Require negotiated contracts to be brought to the Commission for final evaluation, selection and approval. ~~Determine if added capacity beyond 71 MW is needed before the end of 2019.~~

18. ~~21.~~ Select the two projects with terms most favorable to ratepayers among Xcel's Black Dog unit 6, Calpine's Mankato project, and Invenergy's Cannon Falls project. ~~Select GRE's proposal if added capacity beyond 71 MW is needed before the end of 2019.~~

19. ~~22.~~ Require that terms negotiated as part of the PPA process must be consistent with the analysis conducted in this matter. ~~Direct Xcel to undertake Purchase Power Agreement negotiations with the selected offerors.~~

20. ~~23.~~ Order Xcel to issue an All-Solar RFP as soon as possible to obtain the overall best solar projects for meeting Xcel's obligations under Minnesota's recently enacted solar mandate. ~~Conduct a second competitive bidding process for Xcel's needs beyond 71 MW that are likely to occur after 2019.~~

Dated: December 31, 2013

ERIC L. LIPMAN Administrative Law Judge

Reported: Shaddix & Associates, Transcripts Prepared: Two Volumes

NOTICE

Notice is hereby given that exceptions to this Report, if any, by any party adversely affected must be filed under the time frames established in the Commission's rules of practice and procedure, Minn. R. 7829.2700 and 7829.3100, unless otherwise directed by the Commission. Exceptions should be specific and stated and numbered separately. Oral argument before a majority of the Commission will be permitted pursuant to Part 7829.2700, subpart 3. The Commission will make the final determination of the matter after the expiration of the period for filing exceptions, or after oral argument, if an oral argument is held.

The Commission may, at its own discretion, accept, modify, or reject the Administrative Law Judge's recommendations. The recommendations of the Administrative Law Judge have no legal effect unless expressly adopted by the Commission as its final order.