STATE OF MINNESOTA

OFFICE OF ADMINISTRATIVE HEARINGS

FOR THE MINNESOTA PUBLIC UTILITIES COMMISSION

IN THE MATTER OF THE PETITION OF NORTHERN STATES POWER COMPANY TO INITIATE A COMPETITIVE RESOURCE ACQUISITION PROCESS

OAH DOCKET NO. 8-2500-30760, MPUC DOCKET NO. E002/CN-12-1240

REBUTTAL TESTIMONY

OF

ELIZABETH M. ENGELKING

VICE PRESIDENT OF DEVELOPMENT

GERONIMO WIND ENERGY, LLC D/B/A GERONIMO ENERGY, LLC

ON BEHALF OF

GERONIMO ENERGY, LLC

OCTOBER 18, 2013

Exhibit ___

REBUTTAL TESTIMONY OF ELIZABETH ENGELKING

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SCHEDULES

I. INTRODUCTION

Q: Please state your name.

A: My name is Elizabeth Engelking.

Q: Have you previously provided testimony in this proceeding?

A: Yes. I provided direct testimony on behalf of Geronimo Energy, LLC.

Q: Have you reviewed the direct testimony filed by the other parties in this proceeding on September 27, 2013?

A: Yes.

Q: What is the purpose of your rebuttal testimony?

A: The purpose of my rebuttal testimony is to respond to the testimony of Mr. Wishart of Xcel Energy, Dr. Rakow of the Department of Commerce, and Mr. Hibbard of Calpine with respect to Xcel's need, Strategist modeling, cost comparisons, and recommendations in this case.

Q: Do you agree with the recommendations of Xcel Energy and the Department of Commerce?

A: I do not. Xcel and the Department of Commerce, relying nearly exclusively on a single tool (the Strategist Model) have recommended that the Company acquire new non-renewable resources that exceed Xcel's likely need. In developing these recommendations, they have failed to properly quantify and consider significant value offered by Geronimo's Distributed Solar Energy Proposal ("Solar Proposal"). Xcel further proposes, once its own project is secured through Commission Order, to negotiate with select other bidders in a manner that could nullify the intent of this Competitive Resource Acquisition Process.

II. XCEL'S CHANGING NEED

Q: On pages 4-11 of Mr. Wishart's Direct Testimony, Mr. Wishart explains factors resulting in changing resource needs for Xcel in the 2017-2019 planning period. What are your observations regarding these resource need changes?

A: I understand the uncertainty and changing environment that impact a utility's overall resource needs. Because Xcel is acquiring resources to meet needs at the margin of its forecast (i.e. the difference between its current forecast and its existing resources), even small changes in a forecast can greatly influence resource needs. Mr. Wishart has pointed out two important changes in Xcel's planning forecast that appear to have a large impact on the resource need that the Commission approved in Xcel's last resource plan. First, Xcel's forecasted demand continues to decrease, resulting in a reduction of need by 60 MW in 2017 and 136 MW by 2019.[1] The larger impact on need, however, is the recent change in how MISO calculates its required reserve margins. Based on Table 4 of his direct testimony, Mr. Wishart suggests that once these changes take place, Xcel will actually have excess capacity of 84-183 MW in 2017, and a deficit of only 26-128 MW by 2019.

Q: Mr. Wishart also attributes part of this change in resource needs to passage of Minnesota's Solar Energy Standard ("SES"). Do you agree with Mr. Wishart's assessment of solar's overall capacity contribution to meeting Xcel's resource needs?

[1] Wishart Direct, Table 2, at 7.

A: Mr. Wishart has included 49 MW of accredited solar capacity by 2017 and 83 MW of accredited solar capacity by 2019 in his assessment.[2] These numbers, which represent Xcel's estimate of the accredited capacity it will receive on installed solar needed to meet its SES, are based on Xcel's preliminary and low capacity credit assumption of 42% (AC) and 36% (DC).[3] Geronimo Witness R. Thomas Beach addresses why the ALJ and Commission should not rely on these accreditation estimates in greater detail in his rebuttal testimony. As he discusses, I expect that installed solar will actually receive a higher capacity accreditation, further reducing Xcel's need for non-solar resources in this docket.

Q: Did the Department include a similar range of forecasted need in its assessment?

A: Yes. The Department also considered a range of potential scenarios that included the 2011 and 2013 forecasts, two different constructs for meeting MISO's reliability requirements, and two different scenarios for estimating the capacity solar will contribute to meeting Xcel's needs.

Q: After describing Xcel's changing needs, Mr. Wishart recommends selecting the Black Dog and either Invenergy or Calpine from this process and reassessing need in 2014 and thereafter.[4] Dr. Rakow recommends selecting Calpine's proposal and Black Dog in 2019.[5] Do you agree with these recommendations?

A: No. Given the wide range of potential need, I think it is important that the Commission step back from the modeling results and apply a common sense approach. Both Xcel's and the Department's Strategist analyses appear to significantly bias their

[2] *Id*.
[3] Wishart Direct, at 22, ln. 21-23.
[4] Wishart Direct, at 2.
[5] Rakow Direct, at 43.

recommendations toward larger combinations of resources that may provide more than three times Xcel's actual need in this timeframe. Mr. Wishart notes that, depending on which MISO reserve margin methodology applies, Xcel's need may be as small as 26 MW during the 2017-2019 timeframe, yet the smallest combination of plant acquisitions recommended by Xcel totals 358 MW, and the plan recommended by the Department totals 495 MW.

III. RENEWABLE CAPACITY ALTERNATIVE

Q: Do you agree with the Department's and Xcel's recommendations that Geronimo's project should be deferred to a separate solar-only RFP as part of Xcel's upcoming 2014 resource plan?

A: No. While Geronimo encourages Xcel to issue an RFP for solar energy needed to meet its SES obligations, passage of a SES in Minnesota does not excuse Xcel from meaningfully evaluating an available, competitive renewable capacity resource bid in this docket. Geronimo's Solar Proposal is specifically designed, using tracking systems and distributed sites, to offer reliable, competitive renewable capacity to meet Xcel's needs. The fact that the Solar Proposal can also help meet the SES is an added benefit of the proposal, but, fundamentally, is not any different than the fact the Solar Proposal could have been used to meet Xcel's Renewable Energy Standard ("RES") obligations if the SES had not been passed by the 2013 Legislature.

Q: Please explain why you disagree with the statements that the Solar Proposal should be evaluated in the context of an all solar RFP.

A: The idea that Geronimo's proposal can only be evaluated against other solar proposals is flawed for several reasons. First, there is only one combined cycle ("CC") unit bid in this

docket (Calpine) and only one proposal for market capacity (GRE). Nonetheless, no one has suggested removing them from this proceeding to ensure that there aren't other CC or market capacity bids that would be more cost effective. The tight range of present value societal costs ("PVSCs") for the bid combinations, including those that include the Solar Proposal, provides evidence of the competitiveness of Geronimo's proposal, and there is more than enough information in this record to compare the merits of the Solar Proposal relative to the other bids submitted in this docket.

Second, recommendations that fail to seriously evaluate Geronimo's Proposal in this docket ignore the unique design of our proposal and, instead, lump all solar technology together as though it is all the same. Geronimo's proposal was designed to balance Xcel's need for capacity with energy production. Solar projects bid specifically to meet the SES may instead be designed to maximize energy production, since the SES is an energy standard. Suggesting that Geronimo's bid is comparatively the equivalent of a solar project designed specifically to meet the SES is like saying CC and combustion turbine ("CT") units are effectively the same because they are both natural gas plants.

Finally, Geronimo understood at the onset of the proceeding that it would be competing head to head with natural gas plants and it had every incentive (especially since its bid was submitted prior to passage of the SES) to cost-effectively design the proposal to compete with natural gas units. The costs and benefits of the Solar Proposal must be compared with other bids submitted in this docket, not against speculation regarding resources that may be bid in a separate RFP to fill a different identified need.

IV. STRATEGIST MODELING CRITIQUES

Q: Are you familiar with the Strategist model and how it works?

A: Yes. In my previous position as Director of Resource Planning and Bidding at Xcel Energy, I directed and oversaw the operation of Strategist modeling in connection with creating utility resource plans and making resource acquisition decisions. I have received training on the Strategist modeling and understand its basic functions and operations.

Q: Did you review the Strategist modeling results submitted with Dr. Rakow's and Mr. Wishart's direct testimonies?

A: Yes. I carefully reviewed both Strategist results and observed a number of issues in both models.

Q: Please identify the issues you observed in Xcel's and the Department's Strategist modeling.

A: As with any model, Strategist results are a reflection of the assumptions that one uses to set up the model. Essentially, you must ask the right questions and include accurate assumptions to get relevant results. I agree with Calpine Witness Mr. Hibbard that Strategist is but one tool that should be considered among several analyses and data points produced in this record. In Table 1 below, I summarize various questionable Strategist assumptions, identify whether the assumptions impact Xcel's or the Department's results, and provide a short summary of the impact of these assumptions. The rest of this section of my rebuttal provides additional detail regarding each issue.

Table 1: Strategist Model Critiques

Strategist Assumption	Impact	Reference	Impacted Model
Modeled capacity need exceeding 200 MW in 2017-2019 timeframe when need more likely ranges	Biases results in favor of larger plants or combinations of plants	Wishart Direct, Table 4 and p. 22 ln. 25 – 27; Rakow Direct, at 26.	Department and Xcel

from 26 to 128 MW			
Undervalued and failed to recognize SES compliance benefits of Solar Proposal	Excludes substantial, recognized value that solar, as a renewable resource, offers to Xcel	Wishart Direct, Table 8 at 35; Rakow Direct, at 9-10.	Department and Xcel
Modeled Solar Proposal as stand-alone resource assuming generic resources at costs higher than those proposed in this docket for comparable resources	Overestimates costs of Solar Proposal by attributing higher cost generic fossil fuel units to Solar Proposal	Rakow Direct, at 30-33.	Department
Assigned $5.92/ kW-mo. levelized capacity credit value to excess capacity	Biases results in favor of larger portfolios, attributing economic benefits ratepayers are unlikely to realize	Wishart Direct, at 37.	Xcel
Failed to run sensitivity analysis on any combinations that include the Solar Proposal	Fails to show benefits of Solar Proposal in high gas, high environmental cost and other potential scenarios	Wishart Direct, Table 9, at 39.	Xcel

Q: Why do you believe both models incorrectly considered Xcel's overall need during the 2017-2019 timeframe?

A: Both Mr. Wishart and Dr. Rakow discussed the forecast and reserve margin changes extensively in their direct testimony, noting that Xcel's needs may be much lower than previously identified in the Resource Plan. When setting up the model, Mr. Wishart made some modifications to Xcel's modeled need assessment, adopting the spring 2013 forecast in lieu of the September 2011 forecast used in the Resource Plan decision. However, he applied the 2011 MISO reserve margin calculation to the non-coincident peak forecast to determine need, instead of the new method that has already been adopted

by MISO and is in effect this year. As a result, Mr. Wishart's model overstates Xcel's resource need by 200-300 MW.[6] Similarly, while Dr. Rakow evaluated the 2013 Spring Forecast with the MISO coincident reserve margin methodology in some of his Master Scenarios, he reverted to the higher 2011 forecast for his second round analysis.[7]

Q: What is the effect of using a resource need that is too high in this type of proceeding?

A: A resource need that is too high will cause the model to select more resources than Xcel needs, resulting in excess capacity and excess cost that will ultimately be paid by its customers. To determine how assuming a smaller overall need would impact the model results, Geronimo asked Xcel to rerun its Strategist model using the MISO reserve margins for 2014 depicted in Table 4 of Wishart's Direct Testimony.[8] As shown in Xcel's response to Geronimo Information Request No. 23 in Schedule EME-1 of my Rebuttal Testimony, when the model was asked to fill a 128 MW need by 2019, the least cost plan was to build the 208 MW Black Dog 6 unit in 2018 at a PVSC of $45,186 million. Changing this one model assumption created an "optimal" plan with a PVSC that is $180 million lower than Xcel's recommended 358 MW plan.

Q: Please describe why you believe that Xcel's and the Department's Strategist model undervalued or failed to recognize the SES-compliance value of the Solar Proposal.

A: Both the Department and Xcel have modeled Geronimo's Solar Proposal as an additional solar project on top of the solar that Xcel must add to meet the SES.[9] This assumption

[6] Wishart Direct, at 9, ln 19.
[7] Rakow Direct, at 36, ln 10.
[8] Geronimo IR No. 23, Xcel response attached (Schedule EME-1) (Engelking Rebuttal).
[9] Rakow Direct, at 9-10 and Environmental Intervenor IR No. 7, Xcel Response attached as Schedule EME-2 (Engelking Rebuttal).

highlights why Strategist results must be viewed critically by decision-makers, as it creates a modeling a scenario that is unlikely to ever occur in the real world. The Solar Proposal clearly provides a benefit to Xcel by providing solar energy that can be used to meet the SES. No party has suggested that, if the Commission selects the Solar Proposal, Xcel would not use the energy produced by the Solar Proposal to meet the SES. Yet, both the Department and Xcel have chosen to model the Solar Proposal in addition to the SES.

I acknowledge that because of the limitations of the Strategist model, including the Solar Proposal within the SES becomes a comparison of Geronimo's price versus the price Xcel assumed for the generic solar units and that doing so is of limited analytical value. However, by assuming the Solar Proposal will be additive to the SES, both the Department and Xcel have also failed to recognize that Xcel will receive economic value from S-RECs, regardless of whether Xcel retires them to meet the SES or sells them to other Minnesota utilities to meet their SES obligations. As I discuss more fully below, if Geronimo's bid is evaluated in addition to the SES, then the economic analysis of the proposal should recognize that Xcel will acquire excess S-RECs it may sell to other utilities to meet their SES requirements.

Q: Please describe why you believe the Department's modeling of the Solar Proposal as a stand-alone resource overestimates the costs of the Solar Proposal.

A: When the Department performed its second round/sensitivity analysis, it modeled Geronimo's project as a stand-alone resource, with generic resources left to fill in capacity deficits that were in excess of the 72 MW offered by Geronimo. The Department included assumptions regarding the costs of generic units that were provided

by Xcel.[10] Xcel's assumptions regarding the cost of generic units included within Strategist are significantly higher than the price of comparable resources bid in this docket.[11] Because the generic resource options provided by Xcel were higher cost than the actual resources proposed in this process, the Department's analysis does not provide a reasonable look at how a portfolio of proposed resources that includes Geronimo compares with the Department's recommended portfolio. As a result, the Department failed to consider what a real solution including the Solar Proposal would cost under varying assumptions such as higher gas costs or higher carbon.

Q: Why do you believe it is important to review sensitivity analyses for resource combinations that include the Solar Proposal?

A: The "base case" represents only one possible future outcome of Xcel's resource needs, based on a set of what Xcel considers the "most likely" outcomes for assumptions such as forecast, gas prices, inflation rates, plant availability, and hundreds of other items. Sensitivity analysis looks at what would happen if an outcome were significantly different from the base assumption. For example, a higher gas price forecast would increase the cost of certain plants, and a lower environmental cost could make fossil fuel plants more attractive.

Xcel only provided sensitivity analyses on the top 20 plans of its Strategist model, none of which includes Geronimo's proposal. We asked Mr. Wishart to provide sensitivity analyses for his top three scenarios that included Geronimo. As shown in his response to our Information Request No. 11, the top portfolio including Geronimo has a

[10] Geronimo IR No. 11, DOC Response attached (Schedule EME-3) (Engelking Rebuttal).
[11] Rakow Direct, at 30, ln 1-8.

PVSC that is only $8 million higher than Xcel's recommended portfolio when a higher gas price is considered, and another portfolio is $5 million less.[12] This is within a range of PVSC differences that can be considered insignificant for a Strategist model of this magnitude. Further, the closeness of this result does not take into account additional values of the Solar Proposal discussed in Section V of my rebuttal testimony.

Q: Please describe how utilizing a capacity credit impacted Xcel's Strategist results.

A: A capacity credit essentially acts like a sale of excess capacity at a designated price. Xcel used the capacity credit to equalize the size of various portfolios it modeled to meet the resource need. The capacity credit has the effect of ignoring the impact of excess capacity and its associated cost in Strategist modeling. For example, Xcel claims that its top two portfolios (ICF16/BD18 and Calpine/BD19) have PVSC's within $2 million of each other, despite the fact that one portfolio consists of 358 MW and the other is 486 MW.[13] However, Table 7 of Mr. Wishart's Direct Testimony shows that one of the cost components that brings the much larger portfolio of Calpine/Black Dog in line with the Invenergy/Black Dog portfolio is a capacity credit that reduces the PVSC of the Calpine portfolio by $55 million.[14]

Using a capacity credit can encourage the acquisition of higher cost portfolios that provide more capacity than is needed and leave customers to pick up excess costs. Although there is a bilateral market for capacity, and MISO has discussed creating a longer term capacity credit, Xcel has failed to justify its assumption that its excess capacity will be worth the $5.92/kW-month that it has included in the model. This value

[12] Geronimo IR No. 11, Xcel Response attached (Schedule EME-4) (Engelking Rebuttal).
[13] Wishart Direct, p. 23, lines 19-24.
[14] Wishart Direct, pg. 32.

appears to assume that Xcel is able to sell this excess capacity through a long-term bilateral agreement, when I believe it is more likely that Xcel will sell capacity in the short-term market so that it can "grow into" the resource as needed over time. The current price for short-term capacity in the MISO market is $0.03/kW-mo.[15] Therefore, it is unlikely ratepayers are going to receive Xcel's estimated benefits for overbuilding capacity now.

Q: Did the Department also assign capacity credit values to portfolios that exceed Xcel's need?

A: No. When the Department ran Strategist, it did not provide an opportunity for Xcel to sell to the wholesale market.[16]

Q: Given the issues you have identified regarding the Strategist models, how do you recommend the ALJ and Commission use the Strategist results to inform their decisions in this docket?

A: Strategist results should be viewed as one data point for consideration within this complex docket. I'm very concerned that both Xcel's and the Department's recommendations appear to rely solely on the PVSC results of the Strategist model. While Strategist is a useful tool for evaluating resource options, it does not provide an "answer," nor does it "pick a winner." The model consists of hundreds of assumptions about future conditions, and many times the cost differences between models are a result of "decisions" within the modeling runs that have little to do with the resources that are being compared. Mr. Wishart and Dr. Rakow acknowledge this throughout their

[15] 2013/2014 MISO Planning Resource Auction Results attached (Schedule EME-5) (Engelking Rebuttal).
[16] Geronimo IR No. 17, DOC response attached (Schedule EME-6) (Engelking Rebuttal).

testimony, based on their individual decisions regarding which forecast to use, the end date of the model, whether or not to include a capacity credit, whether to lock down model "tails," what types of generic resources to include and when to make those resources available in the model.

Further, Strategist results are open to interpretation. For example, in this proceeding Xcel has dismissed a PVSC difference of $34 million as "not cost effective."[17] In the April 10, 2009 *Petition of Northern States Power Company for Approval of Investments in Two Wind Power Projects: 200 MW Nobles Wind Project and 150 MW Merricourt Wind Project* (Docket No. E002/M-08-1437), Xcel alternatively characterized Strategist results showing a $151 million higher PVRR for wind projects it proposed to own as a "minor impact on [Xcel's] net system costs." The discrepancy between these two cases demonstrates that Strategist results are merely advisory to the decision of what resources should be selected, and not determinative.

Finally, Strategist does not consider or evaluate the various factors set forth in statute and rule that must be considered when making resource acquisition decisions. It is up to the ALJ and Commission to identify the relevant facts that support each of the factors required to determine if a particular proposal is needed under the relevant law.

V. COST COMPETITIVENESS OF SOLAR

Q: Do you agree with Mr. Wishart's statement on p. 33 of his Direct Testimony that Geronimo's proposal is "high cost"?

A: No. As shown below, the levelized cost of energy for the Solar Proposal compares favorably to those of the other long-term resource proposals in this proceeding. In

[17] Wishart Direct at 33, ln 20.

addition, Xcel has failed to recognize specific, quantifiable value that Geronimo's project will provide Xcel. This value can be subtracted from the PVSCs of portfolios that include Geronimo's project to provide additional information about their relative ranking in Xcel's analysis.

A. LCOE Analysis

Q: Calpine Witness Mr. Paul Hibbard's Direct Testimony includes a levelized cost of electricity ("LCOE") analysis.[18] Do you have any observations regarding Mr. Hibbard's LCOE analysis?

A: Yes. I thought Mr. Hibbard's LCOE analysis was a useful, transparent way to present the comparative costs of each proposal. However, Mr. Hibbard did not include Geronimo's Solar Proposal in his LCOE analysis.

Q: Were you able to recreate Mr. Hibbards's LCOE analysis to include Geronimo's Solar Proposal?

A: Yes. Using the assumptions Mr. Hibbard provided in Exhibit Nos. _ - PJH-3 and PJH-4, I was able to replicate the results shown for the PPA proposals for Calpine and Invenergy. I did not attempt to replicate Mr. Hibbard's results for Xcel Energy, but instead, for the purposes of my rebuttal, have assumed Mr. Hibbard's calculations were sound. Based on his methodology for analyzing the other PPA proposals, I then applied his LCOE analysis to Geronimo's Solar Proposal.

Q: What were the results of the LCOE analysis when Geronimo's Solar Proposal was included?

[18] Hibbard Direct, at 10-21.

A: Figure 1 shows that the Solar Proposal has a lower levelized cost of electricity than any of the thermal units evaluated by Mr. Hibbard.

[TRADE SECRET DATA HAS BEEN EXCISED…

…**TRADE SECRET DATA HAS BEEN EXCISED]**

Q: Did you also recreate Mr. Hibbard's emissions analysis to include Geronimo's Proposal?

A: Yes. While it may be obvious that, as a solar resource with no emissions, Geronimo's Solar Proposal compares favorably to the proposed fossil fuel resources, I still think the visual representation is important. Figures 2 and 3 below add Geronimo's bid to Exhibit PJH-6a and Exhibit PJH-6b of Mr. Hibbard's Direct Testimony.

[TRADE SECRET DATA HAS BEEN EXCISED…

…TRADE SECRET DATA HAS BEEN EXCISED]

Q: What conclusions do you reach once Geronimo's proposal is included in the LCOE analysis?

A: Geronimo's proposal compares favorably with the other long-term resource proposals, assuming that they are all operated under normal conditions.

B. Out of Model Adjustments to PVSC

Q: Figure 4 on page 34 and Table 8 on page 35 of Mr. Wishart's Direct Testimony provide a PVSC impact analysis for Geronimo's Solar Proposal. Do Figure 4 and Table 8 accurately reflect the impact of the Solar Proposal?

A: No. Xcel's analysis improperly excluded several benefits of the Solar Proposal that more than eliminate the $34 million PVSC difference between Xcel's "least cost" Plan 1 and the first plan where the Solar Proposal appears. Table 2 shows the adjustments to the PVSC for the Geronimo's Solar Proposal that should be made to account for recognized and quantifiable benefits of Geronimo's Solar Proposal.

Table 2: Adjustments to PVSC Impact of Geronimo Proposal

	PVSC ($M)		
	Wishart Direct	GE Modified, Low SRECs	GE Modified, High SRECs
Geronimo Solar Project			
Geronimo Energy Payments	$186	$186	$186
Long Term Expansion Plan Difference	($1)	($1)	($1)
Value of SRECS	$0	($10)	($38)
Costs Avoided by Solar			
Avoided Energy	$88	$88	$88
Avoided Capacity	$43	$43	$43
Avoided Emissions	$20	$20	$20
Avoided Line Losses (4%)	$0	$9	$9
Avoided Transmission Capacity	$0	$33	$33
Total Avoided Costs	$151	$193	$193
Total NET PVSC	**$34**	**($17)**	**($46)**

Notes:
Table 8 of Wishart Direct, Modified by Geronimo
Value of SRECs is $5 flat (low scenario) and $20 flat (high scenario)
Transmission Capacity Value is $3.80/kw-month, pursuant to MISO's Network Integration Service via MISO's OATT Schedule 9
Line losses are based upon Geronimo's Solar Proposal

Q: Please describe the adjustment you made for the value of S-RECs.

A: Geronimo provided available S-REC value data as part of its Proposal.[19] States that have active, reported S-REC markets have widely varying values of S-RECs. Massachusetts has the highest value, over $200/per S-REC, but focuses much of its standard on on-site, behind-the-meter solar. New Jersey has the most aggressive SES, 4% by 2017, and S-RECs are trading between $130 and $145/per S-REC. Pennsylvania has the lowest value, with S-RECs trading around $13. Given the wide variability in the S-REC market, I believe that a conservative range for valuing Minnesota RECs from installations larger

[19] Geronimo Ex. __, Geronimo's Distributed Solar Energy Proposal, at 34.

than 20 kW is in the $5-$20/per S-REC range. This range conservatively uses the lowest available S-REC (Pennsylvania) as an approximate midpoint for the analysis.

Q: Why do you believe it is appropriate to adjust Geronimo's PVSC for S-REC values?

A: As discussed above, when modeling the Calpine and Invenergy proposals, Xcel assigned a levelized cost of $5.92/kW-mo. for all excess capacity created by portfolios that exceed Xcel's modeled need.[20] As shown in Table 7 of Mr. Wishart's Direct Testimony, those capacity credits create a $55 million adjustment to Calpine's PVSC impact relative to Invenergy's proposal. In response to an information request, Xcel stated it included capacity credits "to give value to portfolios with larger capacity."[21] To create parity for the Solar Proposal, especially considering Xcel has modeled the Solar Proposal in addition to its SES requirements, the PVSC should be adjusted to recognize the S-REC value Xcel will acquire under the proposed Solar Proposal PPA. Under Geronimo's proposed PPA, all energy, capacity and environmental attributes, including S-RECS, are sold to Xcel. Thus, even if Xcel would, for some reason, choose not to retire the S-RECs to comply with its SES, it could sell those "excess" S-RECs to other Minnesota utilities to meet their SES requirements.

Q: Please describe the adjustment you made for transmission line losses.

A: I have made a $9 million adjustment to account for the expected 4% transmission line losses described in Geronimo Ex. __, Geronimo's Distributed Solar Energy Proposal, at page 31. The rebuttal testimony of Geronimo Witness R. Thomas Beach provides additional discussion regarding why this adjustment is appropriate in this case.

[20] Geronimo IR No. 15, Xcel Response attached (Schedule EME-7) (Engelking Rebuttal).
[21] *See id.*

Q: Please describe the adjustment you made for avoided transmission capacity.

A: As discussed more fully in Mr. Beach's Rebuttal Testimony, I have included a $33 million adjustment for avoided transmission capacity attributable to the Solar Proposal.

Q: Have any other adjustments to the PVSC been proposed?

A: Yes. Dr. Rakow suggested that solar integration costs should also be considered when reviewing the costs of the Solar Proposal.[22] However, according to Xcel's response to our information request, Xcel has not calculated or assigned any solar integration costs to the Solar Proposal.[23] Therefore, we have not included an adjustment for solar integration costs.

In addition to the recognized and quantifiable benefits I have discussed above, Mr. Beach's rebuttal testimony also provides additional information regarding other benefits of solar that are quantifiable and currently the subject of Department review and analysis in the Value of Solar Docket (Docket No. E002/CI-13-315). These additional attributes are not recognized in the modeling results or Table 2 above but should be noted when comparing the relative value of the proposals in this docket.

VI. RECOMMENDATION

Q: Do you agree that Xcel should be allowed to negotiate with both Calpine and Invenergy to select the "winning proposal"?

A: No. The purpose of this proceeding is for the Commission to select the appropriate resources to meet Xcel's future need. Xcel's recommendation effectively secures its own project as a result of this proceeding, but would allow it to further negotiate with select

[22] Rakow Direct, at 13, ln 17.
[23] Geronimo IR No. 7, Xcel Response attached (Schedule EME-8) (Engelking Rebuttal).

other proposers, despite the fact that the Commission made it clear that the it would make the selections and that bidders would be bound by their initial proposals. Splitting off certain bidders for direct negotiations gives those bidders the opportunity to modify any number of aspects of their offers to make them more attractive to Xcel, without giving other bidders the same option. Xcel's recommendation changes the nature of this proceeding after all parties have made decisions on how to propose and support their projects based on the initial rules set by the Commission. The ALJ and the Commission will have more than enough information in this record to make the recommendations and decisions that were contemplated in the original Notice and Order for Hearing. While it is true that any outside party selected in the proceeding will need to negotiate a PPA with Xcel Energy, each of the participating parties have previous contractual relationships with Xcel, and there should be no expectation that agreements with the selected projects cannot be reached. Allowing a further negotiation step that favors certain bidders is simply unfair.

Q: Please summarize why the ALJ and Commission should select the Solar Proposal in this proceeding.

A: Minnesota's renewable preference is clear: the Minnesota Public Utilities Commission cannot approve a Certificate of Need or rate recovery for a non-renewable resource unless the utility has demonstrated that a renewable resource is not in the public interest. The legislature has further clarified that, among other things, the public interest determination includes whether the renewable resource helps the utility achieve greenhouse gas reduction goals or meet its renewable or solar standards. These policies were put in place specifically to address this kind of proceeding, to ensure that the Xcel is

not building non-renewable generation when suitable renewable alternatives are available. While Xcel will need to make additional plans to meet its Solar Energy Standard, it cannot fulfill its responsibilities in the case simply by declaring Geronimo's project "too expensive" and pushing it into another proceeding.

Geronimo's Distributed Solar Proposal provides Xcel Energy with reliable, reasonably priced capacity and peak energy while fulfilling Minnesota's many goals and requirements to promote clean, renewable and distributed generation. The ALJ and Commission should select the Solar Proposal to meet a portion of Xcel's need because it provides a competitive capacity resource that also fulfills Minnesota's greenhouse gas reduction goals and its solar energy requirements.

VII. CONCLUSION

Q: Does this conclude your rebuttal testimony?

A: Yes.

☐ **Non Public Document – Contains Trade Secret Data**
☐ **Public Document – Trade Secret Data Excised**
☒ **Public Document**

Xcel Energy
Docket No.: E002/CN-12-1240
Response To: Geronimo Information Request No. 23
Requestor: Christina K. Brusven
Date Received: October 3, 2013

Question:

a) Please rerun the Strategist model using the reserve margin assumptions that resulted in the "2014 anticipated reserve margin" column on Table 4 of Wishart's direct testimony.
b) Please rerun the Strategist model using the reserve margin assumptions that resulted in the "2014 anticipated reserve margin" column on Table 4 of Wishart's direct testimony assuming Geronimo's bid is part of, not in addition to, the Solar Energy Standard.

For each scenario, please provide the resulting bid packages and PVSCs up to and including the first portfolio where Geronimo's bid appears or the top (i.e. least cost) 20 plans, whichever is greater.

Response:

a) Please see Attachment A to this response for the results requested.
b) Please see Attachment B to this response for the results requested.

Preparer: Elie Nakouzi
Title: Resource Planning Analyst I
Department: Resource Planning and Bidding
Telephone: 303-571-6901
Date: October 11, 2013

Top 20 Bid Combinations (2014 Anticipated Reserve margin Run)

	Selected Bids	2013-2050 PVSC $millions	Difference From Plan 1
Plan 1	Black Dog 6 - 2018 - 208MW	$45,186	
Plan 2	Great River Energy - 2016 - 100MW Black Dog 6 - 2019 - 208MW	$45,190	+ $4.6
Plan 3	Black Dog 6 - 2017 - 208MW	$45,198	+ $11.6
Plan 4	Great River Energy - 2016 - 100MW Black Dog 6 - 2018 - 208MW	$45,198	+ $12.3
Plan 5	Great River Energy - 2016 - 200MW Black Dog 6 - 2019 - 208MW	$45,205	+ $19.1
Plan 6	Invenergy Cannon Falls - 2016 - 150MW Black Dog 6 - 2019 - 208MW	$45,206	+ $20.0
Plan 7	Great River Energy - 2016 - 100MW Black Dog 6 - 2017 - 208MW	$45,210	+ $24.0
Plan 8	Great River Energy - 2016 - 200MW Black Dog 6 - 2018 - 208MW	$45,213	+ $26.8
Plan 9	Invenergy Cannon Falls - 2016 - 150MW Black Dog 6 - 2018 - 208MW	$45,213	+ $27.5
Plan 10	Great River Energy - 2016 - 100MW Invenergy Cannon Falls - 2016 - 150MW Black Dog 6 - 2019 - 208MW	$45,218	+ $32.6
Plan 11	Calpine - 2017 - 278MW Black Dog 6 - 2019 - 208MW	$45,220	+ $34.1
Plan 12	Geronimo - 2017 - 72MW Black Dog 6 - 2019 - 208MW	$45,222	+ $36.3
Plan 13	Invenergy Cannon Falls - 2016 - 150MW Black Dog 6 - 2017 - 208MW	$45,224	+ $38.5
Plan 14	Great River Energy - 2016 - 200MW Black Dog 6 - 2017 - 208MW	$45,224	+ $38.5
Plan 15	Great River Energy - 2016 - 100MW Invenergy Cannon Falls - 2016 - 150MW Black Dog 6 - 2018 - 208MW	$45,226	+ $40.1
Plan 16	Calpine - 2017 - 278MW Black Dog 6 - 2018 - 208MW	$45,227	+ $41.5
Plan 17	Geronimo - 2017 - 72MW Black Dog 6 - 2018 - 208MW	$45,230	+ $44.0
Plan 18	Great River Energy - 2016 - 100MW Calpine - 2017 - 278MW Black Dog 6 - 2019 - 208MW	$45,233	+ $46.6
Plan 19	Great River Energy - 2016 - 200MW Invenergy Cannon Falls - 2016 - 150MW Black Dog 6 - 2019 - 208MW	$45,233	+ $47.1
Plan 20	Invenergy Cannon Falls - 2016 - 150MW	$45,241	+ $55.3

Top 20 Bid Combinations (2014 Anticipated Reserve margin Run - Geronimo part of expansion plan)

	Selected Bids	2013-2050 PVSC $millions	Difference From Plan 1
Plan 1	Geronimo - 2017 - 72MW Black Dog 6 - 2018 - 208MW	$45,208	
Plan 2	Great River Energy - 2016 - 100MW Geronimo - 2017 - 72MW Black Dog 6 - 2019 - 208MW	$45,213	+ $4.6
Plan 3	Geronimo - 2017 - 72MW Black Dog 6 - 2017 - 208MW	$45,220	+ $11.6
Plan 4	Great River Energy - 2016 - 100MW Geronimo - 2017 - 72MW Black Dog 6 - 2018 - 208MW	$45,221	+ $12.3
Plan 5	Great River Energy - 2016 - 200MW Geronimo - 2017 - 72MW Black Dog 6 - 2019 - 208MW	$45,228	+ $19.2
Plan 6	Invenergy Cannon Falls - 2016 - 150MW Geronimo - 2017 - 72MW Black Dog 6 - 2019 - 208MW	$45,228	+ $20.0
Plan 7	Great River Energy - 2016 - 100MW Geronimo - 2017 - 72MW Black Dog 6 - 2017 - 208MW	$45,232	+ $23.9
Plan 8	Great River Energy - 2016 - 200MW Geronimo - 2017 - 72MW Black Dog 6 - 2018 - 208MW	$45,235	+ $26.8
Plan 9	Invenergy Cannon Falls - 2016 - 150MW Geronimo - 2017 - 72MW Black Dog 6 - 2018 - 208MW	$45,236	+ $27.5
Plan 10	Great River Energy - 2016 - 100MW Invenergy Cannon Falls - 2016 - 150MW Geronimo - 2017 - 72MW Black Dog 6 - 2019 - 208MW	$45,241	+ $32.4
Plan 11	Great River Energy - 2016 - 200MW Geronimo - 2017 - 72MW Black Dog 6 - 2017 - 208MW	$45,247	+ $38.4
Plan 12	Invenergy Cannon Falls - 2016 - 150MW Geronimo - 2017 - 72MW Black Dog 6 - 2017 - 208MW	$45,247	+ $38.4
Plan 13	Calpine - 2017 - 278MW Geronimo - 2017 - 72MW Black Dog 6 - 2019 - 208MW	$45,247	+ $39.1
Plan 14	Great River Energy - 2016 - 100MW Invenergy Cannon Falls - 2016 - 150MW Geronimo - 2017 - 72MW Black Dog 6 - 2018 - 208MW	$45,248	+ $39.9
Plan 15	Geronimo - 2017 - 72MW Calpine - 2017 - 278MW Black Dog 6 - 2018 - 208MW	$45,255	+ $46.4
Plan 16	Great River Energy - 2016 - 200MW Invenergy Cannon Falls - 2016 - 150MW Geronimo - 2017 - 72MW Black Dog 6 - 2019 - 208MW	$45,255	+ $46.8
Plan 17	Geronimo - 2017 - 72MW Red River 1 - 2018 - 208MW Black Dog 6 - 2018 - 208MW	$45,259	+ $50.5
Plan 18	Great River Energy - 2016 - 100MW Calpine - 2017 - 278MW Geronimo - 2017 - 72MW Black Dog 6 - 2019 - 208MW	$45,260	+ $51.4
Plan 19	Invenergy Cannon Falls - 2016 - 150MW Geronimo - 2017 - 72MW	$45,264	+ $55.4
Plan 20	Geronimo - 2017 - 72MW Calpine - 2017 - 278MW	$45,265	+ $56.2

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Xcel Energy
Docket No.: E002/CN-12-1240
Response To: MCEA Information Request No. 7
Requestor: Kevin Reuther
Date Received: October 3, 2013

Question:

Refer to page 22, lines 18-23 of Mr. Wishart's testimony. Did Xcel perform any runs in which the Geronimo proposal was available to meet the requirement of the Minnesota solar mandate in addition to Xcel's capacity need? If not, why not? If so, provide the input and output files in electronic, .REP format generated by those runs.

Response:

For my direct testimony, we did not conduct any such analysis. In Strategist the solar mandate was modeled using generic solar units. These generic units have a lower price than the Geronimo bid. As such, if the generic resources were removed and replaced by Geronimo, the net impact would have lowered the cost effectiveness of Geronimo.

Recently we have conducted similar Strategist runs at the request of Geronimo. The requested .REP files will be provided as a supplement to this response.

Preparer: Steve Wishart
Title: Director – Resource Planning & Bidding
Department: Resource Planning & Bidding
Telephone: 612-330-6128
Date: October 17, 2013

State of Minnesota
DEPARTMENT OF COMMERCE
DIVISION OF ENERGY RESOURCES

Utility Information Request Response

Docket Number: E002/CN-12-1240 Date Request Received: October 1, 2013

Requested By: Geronimo Energy Date of Response: October 3, 2013

Response submitted by: Steve Rakow

Request No.	
11	Please provide the amount (MW) and cost assumptions used in the Department's Strategist modeling for the following inputs: a) generic CT units; b) generic CC units; c) generic market capacity; d) generic wind units; and e) generic solar units. **DOC Response:** The Department did not change Xcel's size and cost assumptions for the generic units. Note that, as configured here there are actually 3 different versions of CT expansion units and 2 different versions of CC expansion units present in Strategist as configured by the Department. However, one version of CC/CT expansion capacity is available each year. a) Generic CT units: 189 MW accredited capacity throughout the planning period. b) Generic CC units: 303 MW accredited capacity through 2025 and 707 MW accredited capacity thereafter. c) Generic market capacity: The Department did not allow market capacity to be available to Strategist. d) Generic wind units: 13 MW accredited capacity throughout the planning period. e) Not available. For the cost data, see Attachment E.

CC PPA		
Item	**Amount**	**Notes**
Fixed Annual Capacity Rate	$ 80.75	$ / kW-year
Fixed Costs	$ 11,077	$,000 / year
Variable O & M Cost	$ 2.21	$ / MWh
First Year Available	2017	
Last Year Available	2026	

CC Defer		
Item	**Amount**	**Notes**
Fixed Annual Capacity Rate	$ 94.31	$ / kW-year
Variable O & M Cost	$ 2.21	$ / MWh
First Year Available	2027	
Last Year Available	2036	

225 CT		
Item	**Amount**	**Notes**
Construction Expenditures	$ 137,458	in $,000, if construction starts in 2011
Fixed Costs	$ 1,496	$,000 / year
Variable O & M Cost	$ 1.34	$ / MWh
First Year Available	2016	
Last Year Available	2019	

CT PPA		
Item	**Amount**	**Notes**
Fixed Annual Capacity Rate	$ 58.56	$ / kW-year
Fixed Costs	$ 1,496	$,000 / year
Variable O & M Cost	$ 9.82	$ / MWh
First Year Available	2020	
Last Year Available	2026	

CT Defer		
Item	**Amount**	**Notes**
Fixed Annual Capacity Rate	$ 65.27	$ / kW-year
Variable O & M Cost	$ 9.82	$ / MWh
First Year Available	2027	
Last Year Available	2036	

Wind		
Item	**Amount**	**Notes**
Transaction Option Fee	$ 2,000,000	the annual fee which is incurred whether or not the transaction is actually utilized
Transaction Energy Cost	$ 47.39	$ / MWh in 2011, escalated at about 2.36 percent annually

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Xcel Energy
Docket No.: E002/CN-12-1240
Response To: Geronimo Information Request No. 11
Requestor: Christina K. Brusven
Date Received: October 1, 2013

Question:
Reference: Wishart, Direct, p. 39, ln 2 (Table 9).

Did Xcel Energy run sensitivity analyses on any plans beyond the top 20 plans? If yes, please provide results of all sensitivity runs for each scenario that includes Geronimo's proposal. If no, please run sensitivity analyses on the top three portfolios containing Geronimo's proposal and update Table 9 to include those results.

Response:
The Company has run the requested sensitivity runs for the top 3 scenarios containing Geronimo's proposal. The table below identifies these results.

Table 9A – Strategist Input Sensitivity Tests (PVSC)
Top 3 Portfolios with Geronimo Projects

	Base Assumptions	High Gas	Low Gas	Markets Off	$0 CO2	$9 CO2	$34 CO2	Annuity	No Wind	Cap Cred +$1	Cap Cred - $1
Invenergy Cannon Falls Black Dog 6											
Geronimo Top Plan 1st	($34)	($8)	($55)	($34)	($60)	($49)	($19)	($48)	+ $13	($28)	($41)
Geronimo Top Plan 2nd	($42)	($16)	($63)	($42)	($68)	($57)	($27)	($56)	+ $6	($35)	($49)
Geronimo Top Plan 3rd	($47)	+ $5	($90)	($41)	($95)	($74)	($12)	($51)	+ $15	($26)	($67)

Preparer: Elie Nakouzi
Title: Resource Planning Analyst I
Department: Resource Planning and Bidding
Telephone: 303-571-6901
Date: October 11, 2013

2013/2014 MISO Planning Resource Auction Results:

Local Resource Zone (LRZ)	Z1 (MN, ND, Western WI)	Z2 (Eastern WI, Upper MI)	Z3 (IA)	Z4 (IL)	Z5 (MO)	Z6 (IN, KY)	Z7 (MI)	System
Planning Reserve Margin Requirements (PRMR)	17,693.4	13,362.9	9,343.1	10,733.9	9,000.2	19,320.3	22,702.3	102,156.1
Netted DR/EER*	1197.1	728.7	528.8	112.3	0	1191.7	781.6	4,540.2
Adjusted PRMR	16,387.3	12,573.2	8,767.6	10,612.1	9,000.2	18,023.3	21,850.3	97,214.0
Offer								70,412.1
FRAP[1]								34,959.3
Offer + FRAP[1]								105,371.4
Offer Cleared + FRAP[1]								97,214.0
Local Clearing Requirement (LCR)	15,707.7	10,326.2	6,796.4	5,231.9	5,490.7	14,283.5	21,055.0	N/A
Capacity Import Limit (CIL)	4,085.0	4,144.0	3,717.0	6,614.0	5,035.0	6,838.0	4,576.0	N/A
Capacity Export Limit (CEL)	1,416.0	1,766.0	1,612.0	2,230.0	1,616.0	3,432.0	4,306.0	N/A
Auction Clearing Price ($/MW-Day)	1.05	1.05	1.05	1.05	1.05	1.05	1.05	

* Planning Reserve Margin and Transmission losses are not applied to Netted Demand Response (DR) and Energy Efficiency Resources (EERs) in the PRMR calculation.

[1] FRAP = Fixed Resource Adequacy Plan

To convert MW-Day to kW-Month: 365 day year - $1.05/MW-Day * 360days ÷ 12 months ÷ 1000 (Kilowatts-to-Megawatts) = $0.03/kW-Month

Available at: https://www.misoenergy.org/Library/Repository/Report/Resource%20Adequacy/2013-2014%20MISO%20Planning%20Resource%20Auction%20Results.pdf

State of Minnesota
DEPARTMENT OF COMMERCE
DIVISION OF ENERGY RESOURCES

Utility Information Request Response

Docket Number: E002/CN-12-1240 Date Request Received: October 4, 2013

Requested By: Geronimo Energy Date of Response: October 15, 2013

Response submitted by: Steve Rakow

Request No.	
17	References: Rakow Direct, p. 19, ln 10-13 "Turned on Xcel's construct for the wholesale energy market to be consistent with the Department's most recent IRP analysis (see Docket No. E015/RP-13-53); previously, the Strategist had been instructed not to consider (i.e., to turn off) the wholesale energy market." **DOC Response to Geronimo IR#9** "Strategist did nothing with the excess capacity—under the Department's structure, Strategist assigns no value to excess capacity on Xcel's system…" Question Please clarify how the Department's Strategist modeling accounted for the wholesale energy market, describing both how the model handled opportunities to buy from and sell into the wholesale energy market. Please include any assumptions the Department used related to amount (MW), price and environmental costs of modeled wholesale energy. **DOC Response:** Regarding how the model handled opportunities to buy from the wholesale energy market—there was an opportunity to buy from the wholesale energy market because the transmission link between the unit which can make wholesale sales to Xcel was now turned on. Previously this unit had been turned off. Regarding how the model handled opportunities to sell into the wholesale energy market—there was no opportunity to sell into the wholesale energy market because the transmission link between the unit which can make wholesale purchases from Xcel remained off. Regarding the assumptions for amount (MW), price and environmental costs, the Department did not alter the assumptions used by Xcel in the Strategist database.

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Xcel Energy
Docket No.: E002/CN-12-1240
Response To: Geronimo Information Request No. 15
Requestor: Christina K. Brusven
Date Received: October 1, 2013

Question:

Reference: Wishart, Direct, p. 29, ln 16.

a) Please explain the function of the capacity credit Xcel Energy used in its portfolio comparisons.
b) Did Xcel also include this capacity credit in the Strategist model? If yes, in what way was the capacity credit applied?
c) Please provide the assumptions and calculation for the $5.91 capacity credit.

Response:

a) The various portfolios of bids contained different total capacities. Please see Wishart Direct Testimony, Table 5 on p. 26. To give value to portfolios with larger capacity, we applied a capacity credit in Strategist. For example, Plan 1 had 358MW of summer accredited capacity, while Plan 2 had 486MW. Strategist automatically applied a capacity credit of 128MW for Plan 2.
b) Yes, the capacity credit was applied in Strategist. For all portfolios, the model applied a credit based on all capacity in excess of the minimum reserve margin requirement of 3.8%. The credit was applied in all years on a $/kW-mo basis in all 12 months and based on summer accredited capacity.
c) Please see Attachment A to this response. Upon additional review of the data, the 16 year levelized capacity credit was actually $5.92 not $5.91 as originally stated. We apologize for any inconvenience.

Preparer: Steve Wishart
Title: Director – Resource Planning & Bidding
Department: Resource Planning & Bidding
Telephone: 612-330-6128
Date: October 9, 2013

	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*
	2020	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**
Total Capacity Credit ($000)	$3,594	$3,679	$3,766	$3,855	$3,946	$4,039	$4,134	$4,232	$4,332	$4,434	$4,538	$4,646	$4,755	$4,867	$4,982	$5,100
Capacity Credit (MW)	58.51	58.50	58.50	58.51	58.50	58.51	58.51	58.51	58.51	58.51	58.51	58.51	58.51	58.51	58.51	58.51
Capacity Credit $/kW-mo	$5.12	$5.24	$5.36	$5.49	$5.62	$5.75	$5.89	$6.03	$6.17	$6.32	$6.46	$6.62	$6.77	$6.93	$7.10	$7.26
16yr Levelized Credit	**$5.92**															

	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*
	2020	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**
Total Capacity Credit ($000)	$3,594	$3,679	$3,766	$3,855	$3,946	$4,039	$4,134	$4,232	$4,332	$4,434	$4,538	$4,646	$4,755	$4,867	$4,982	$5,100
Capacity Credit (MW)	58.51	58.50	58.50	58.51	58.50	58.51	58.51	58.51	58.51	58.51	58.51	58.51	58.51	58.51	58.51	58.51
Capacity Credit $/kW-mo	$5.12	$5.24	$5.36	$5.49	$5.62	$5.75	$5.89	$6.03	$6.17	$6.32	$6.46	$6.62	$6.77	$6.93	$7.10	$7.26
16yr Levelized Credit	**$5.92**															

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Xcel Energy
Docket No.: E002/CN-12-1240
Response To: Geronimo Information Request No. 7
Requestor: Christina K. Brusven
Date Received: October 1, 2013

Question:

Please provide an estimate of Xcel's expected solar integration costs attributable to Geronimo's 100 MW Solar Proposal.

Response:

NSP currently does not have an estimate for solar integration and did not apply a solar integration assumption in the Strategist modeling.

Preparer: Steve Wishart
Title: Director – Resource Planning & Bidding
Department: Resource Planning & Bidding
Telephone: 612-330-6128
Date: October 9, 2013