

Surrebuttal Testimony and Schedules
Elizabeth Engelking

State of Minnesota
Before the Office of Administrative Hearings
For the Minnesota Public Utilities Commission

*In the Matter of a Petition by Excelsior Energy Inc. for Approval of a Power
Purchase Agreement Under Minn. Stat. § 216B.1694, Determination of Least
Cost Technology, and Establishment of a Clean Energy Technology Minimum
Under Minn. Stat. § 216B.1693*

OAH Docket No. 12-2500-17260-2
PUC Docket No. E6472/M-05-1993

System Impact Analysis

October 31, 2006

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1 **I. INTRODUCTION**

2
3 Q. PLEASE STATE YOUR NAME.

4 A. My name is Elizabeth Engelking.

5
6 Q. HAVE YOU PROVIDED DIRECT TESTIMONY IN THIS CASE?

7 A. Yes. I provided Direct Testimony regarding the impact of the MEP-I LLC
8 (“Mesaba 1 LLC”) purchased power agreement (“Mesaba 1 PPA”) on Xcel
9 Energy’s operating system. I compared the estimated costs of adding the
10 Mesaba 1 PPA to Xcel Energy’s system against those for our approved
11 Resource Plan, which showed that the Mesaba 1 PPA is not, and is not likely
12 to be, a least-cost resource.

13
14 **II. PURPOSE**

15
16 Q. WHAT IS THE PURPOSE OF YOUR SURREBUTTAL TESTIMONY IN THIS
17 PROCEEDING?

18 A. I address Mesaba 1 LLC’s Rebuttal Testimony regarding the cost impact of
19 the Mesaba 1 PPA as a system resource. Specifically, I discuss:

- 20 • Mesaba 1 LLC’s use of the IPM model to analyze the cost impact of
21 the Mesaba 1 PPA on Xcel Energy’s operating system;
22 • the estimates of various cost elements used in the IPM modeling; and
23 • various criticisms of Xcel Energy’s resource planning process and the
24 Strategist modeling.

25 In my testimony I respond to the testimony of Joseph Cavicchi, Maria
26 Scheller, Thomas Oстераas, Renee Sass, Andrew Weissman, Edward Bodmer,
27 and Ronald Wolk on these issues.

1
2 **III. ASSESSMENT**
3

4 Q. HOW SHOULD THE COST IMPACT OF THE MESABA 1 PPA BE ANALYZED?

5 A. I have analyzed whether Mesaba 1 PPA is or is likely to be a least-cost
6 resource for Xcel Energy's operating system using the same tools I would use
7 in resource planning analysis, which focuses on least-cost planning. This
8 requires incorporating the cost and operational assumptions that Mesaba 1
9 LLC has provided for its IGCC plant ("Mesaba Unit 1") into the model Xcel
10 Energy uses to determine which generation options will yield the least-cost
11 plan for meeting our system's future needs. The model we use, Strategist, has
12 been providing this type of system cost analysis in regulatory proceedings for
13 many years. The Strategist inputs and assumptions developed in our
14 approved Resource Plan were reviewed in the course of the Minnesota Public
15 Utilities Commission ("Commission") resource planning process for Xcel
16 Energy. Because the Mesaba 1 PPA does not offer a fixed price, my analysis
17 also reviewed scenarios to account for changes in the cost and operational
18 assumptions that Mesaba 1 LLC has identified for Mesaba Unit 1. This
19 analysis provides a range of potential costs for the Mesaba 1 PPA. For
20 instance, the cost impact of the PPA will be higher or lower if the Mesaba
21 Unit 1 EPC costs are either more or less than predicted by Mesaba 1 LLC.

22
23 **A. Modeling the Cost Impact of the Mesaba 1 PPA**

24 Q. WHAT DID THE STRATEGIST COST ANALYSIS OF THE MESABA 1 PPA SHOW?

25 A. The cost analysis provided in my Direct Testimony shows that the Mesaba 1
26 PPA is not a least-cost resource. Using the operating and cost assumptions
27 that Mesaba 1 LLC itself provided for its IGCC plant in our analysis, the

1 Mesaba 1 PPA is not a least-cost resource versus other options. The PVRR
2 for operating the system with the PPA is roughly \$1.5 billion more than the
3 PVRR for operating the system under Xcel Energy's approved Resource Plan.
4

5 Q. WHAT WAS MESABA 1 LLC'S REBUTTAL TESTIMONY WITH REGARD TO THIS
6 CONCLUSION.

7 A. Ms. Scheller attempted to conduct her own analysis of the cost impact of the
8 Mesaba 1 PPA on our system using a different model, IPM. She modeled
9 four scenarios that compare the PVRR for our system under the Resource
10 Plan and the PVRR with the Mesaba 1 PPA included. In the first scenario,
11 Ms. Scheller adjusted a key cost input to calibrate the IPM model to Strategist.
12 In the other three scenarios, she made further adjustments to key cost and
13 operational inputs. As a result of all these adjustments, the IPM model
14 produced results showing that the PVRR for our system with the Mesaba 1
15 PPA in place was equal to the PVRR for the system under our Resource Plan,
16 and in one instance the Mesaba 1 PPA PVRR was less than that for the
17 Resource Plan.

18
19 Q. WHY ARE MS. SCHELLER'S IPM COST MODELING RESULTS DIFFERENT THAN
20 YOURS?

21 A. Ms. Scheller changed key inputs and assumptions.
22

23 Q. DO YOU AGREE THAT THE ADJUSTMENTS MADE BY MS. SCHELLER WERE
24 APPROPRIATE?

25 A. No. The IPM model is not calibrated to Strategist, and the various cost
26 adjustments that Ms. Scheller made in the IPM modeling are not justified by

1 any facts. The modeling provides no assistance in reaching the least-cost
2 resource determination in this proceeding.

3
4 Q. DO YOU AGREE WITH MS. SCHELLER AND OTHER MESABA 1 LLC WITNESSES
5 CRITICISM OF THE STRATEGIST MODELING AND THE RESOURCE PLAN?

6 A. No. I respond to the criticisms relating to the treatment of the
7 Sherco/nuclear upgrades and environmental externalities in my testimony
8 below, and to the rest of the criticisms in Exhibit___(EME-2), Schedule 1
9 attached to my testimony.

10
11 **B. Calibration of the IPM model to Strategist**

12 Q. WHAT IF ANY INPUT ADJUSTMENTS DID MS. SCHELLER MAKE TO CALIBRATE
13 THE IPM MODEL TO MIMIC STRATEGIST?

14 A. I have asked for but not yet received the inputs Ms. Scheller used for her IPM
15 modeling, so I am limited to the information she provided in her testimony.
16 Ms. Scheller testifies that she calibrated the IPM model to Strategist by using
17 all the inputs that were used in Strategist except for two: the price of gas and
18 the availability of the Sherco/nuclear upgrades. She used \$5.37/MMBtu
19 (2005\$) as the price of gas for all forecast years, and allowed the
20 Sherco/nuclear units to be selected as resource options. Based on this, the
21 IPM model came up with a PVRR differential between the Resource Plan and
22 Mesaba 1 PPA scenario that was \$700 million less than the differential shown
23 by Strategist. The PVRRs resulting from the Strategist and IPM modeling are
24 shown in Table 1 below.

1

Table 1

	Resource Plan	Mesaba 1 PPA	Mesaba 1 PPA PVRR vs. Resource Plan
Strategist PVRR (\$000)	\$34,518,681	\$36,031,616	+\$1,512,935 + 4.4%
IPM PVRR (\$000)	\$33,500,000*	\$34,312,000*	+\$812,000* +2.4%
** Calculated based on Ms. Scheller's testimony that the IPM PVRR for the Resource Plan is "\$33.5 billion," and the IPM PVRR for Mesaba 1 PPA is "\$0.7 billion less than that reflected in the NSP analysis." Scheller Testimony at 15.			

2

3 Q. DOES THIS MODELING RESULT DEMONSTRATE THAT MS. SCHELLER WAS ABLE
4 TO CALIBRATE THE IPM MODEL TO MIMIC STRATEGIST?

5 A. No, this exercise does not demonstrate that the two models are calibrated.
6 The PVRR for the Resource Plan produced by IPM is fully a billion dollars
7 off of the PVRR produced by Strategist. In addition, this result was achieved
8 by adjusting a key cost input to an artificially low and constant level that does
9 not reflect the higher gas prices used in Strategist, and by allowing the IPM
10 model to select the Sherco/nuclear unit upgrades that were not allowed in
11 Strategist due to excess capacity concerns. Given that the Resource Plan and
12 Mesaba PVRRs from IPM could only be achieved by significantly varying key
13 components used in Strategist, the model must not be making calculations
14 using all the other Strategist inputs in the same manner as Strategist does. In
15 light of the complexity of resource planning models and the extensive Xcel
16 Energy system data built into Strategist, I am not surprised that another
17 modeling tool could not be accurately calibrated to mimic Strategist in this
18 shorthand manner. Although Ms. Scheller attributes the difference between
19 the two models solely to gas pricing and the availability of the Sherco/nuclear
20 units, she points to no facts that support the conclusion that these are the
21 only differences between the two models' calculations.

22

1 Q. WHY DID MESABA 1 LLC NOT TREAT THE SHERCO/NUCLEAR UNIT UPGRADES
2 IN THE IPM CALIBRATION MODELING THE SAME WAY AS THEY WERE TREATED
3 IN THE STRATEGIST MODELING?

4 A. Ms. Scheller objected that including the Sherco/nuclear upgrades in the
5 Strategist system cost modeling for the Resource Plan but excluding them in
6 modeling for the Mesaba 1 PPA resulted in the PPA not being modeled on a
7 “level playing field,” and therefore her adjustment was appropriate.

8

9 Q. DO YOU AGREE WITH THIS CONCLUSION?

10 A. No. As I explained in my direct testimony, the Mesaba 1 PPA provides
11 capacity and energy in excess of system needs over the period when the
12 Sherco/nuclear upgrades would be executed under our Resource Plan. So I
13 removed the 300 MW of upgrades so Strategist would not select these lower-
14 cost resource options. This adjustment was not intended to tip the playing
15 field to the PPA’s disadvantage.

16

17 Q. WHY DID MESABA 1 LLC ADJUST THE GAS PRICE TO \$5.37/MMBTU?

18 A. While Ms. Scheller states that the price was an attempt to provide a proxy for
19 the Strategist gas prices, this proxy does not reflect the range of prices used in
20 Strategist, and remains fixed within and between forecast years rather than
21 varying to reflect predicted market volatility, as was done in Strategist. This
22 adjustment necessarily results in the economic dispatch of units being
23 different in the IPM and Strategist models, underscoring that the IPM model
24 was not calibrated to Strategist. Rather, key inputs were adjusted as necessary
25 so that the IPM model would arrive at a Resource Plan PVRR that Mesaba 1
26 LLC considered sufficiently close to Strategist’s to claim the two models were
27 calibrated.

1

2 Q. WHAT IS THE SIGNIFICANCE OF THE IPM CALIBRATION MODELING?

3 A. Assuming the IPM model accurately replicates our system costs (which is
4 impossible to confirm based on the information provided), and that a
5 constant gas price input of \$5.37/MMBtu is reasonable (which it is not, as will
6 be discussed later in my testimony), it appears Mesaba 1 LLC agrees that their
7 project is not a least-cost resource. Beyond this, the modeling does not
8 demonstrate anything of value.

9

10 **C. Other IPM Modeling Adjustments**

11 Q. OTHER THAN THE GAS PRICE ADJUSTMENT THAT WAS MADE IN THE IPM
12 CALIBRATION MODELING, WHAT ADDITIONAL INPUT ADJUSTMENTS DID MS.
13 SCHELLER MAKE IN THE IPM MODELING?

14 A. Based on Ms. Scheller's testimony, she adjusted four inputs in all of her other
15 modeling scenarios:

16 1) Load growth was increased to 2.0% annually for energy (versus our
17 forecast of 1.68%), and the load factors in Strategist were used to
18 "establish a comparable [p]eak demand level."

19 2) The price of gas was increased to \$7.67/MMBtu (real 2007\$) in one
20 scenario, and to \$14.00/MMBtu in another, prices that were provided
21 by Mr. Weissman.

22 3) The capital costs for new coal and combined cycle/combustion turbine
23 gas units were increased by specified amounts, again based on
24 information from Mr. Weissman.

25 4) The Mesaba Unit 1 outage rates for the years 2011 through 2014
26 (declining from 35% in 2011 to 13% in 2014) were reduced to 5% per
27 year.

1 As a result of all these adjustments, the IPM modeling of the PVRR for the
2 system under our Resource Plan was either equal to or higher than the PVRR
3 for the system with the Mesaba 1 PPA included.

4
5 Q. DO YOU CONSIDER THE ADJUSTMENTS MS. SCHELLER MADE APPROPRIATE?

6 A. No. With respect to Xcel Energy's load growth, Ms. Scheller assumes that
7 historical data is sufficient to forecast the future. Our load forecast of course
8 takes historical trends into consideration, but it also necessarily considers
9 current and expected short-term and long-term developments that affect
10 growth. The load growth forecasts in our approved Resource Plan were
11 developed to a 90% confidence level and thoroughly reviewed by the
12 Department, which accepted them with the reservation that the forecasts may
13 be too high, not too low. In addition to her forecast being limited to an
14 analysis of historical data only, Ms. Scheller admits that it was not developed
15 to a 90:10 confidence level as Xcel Energy's load growth forecast was.

16
17 Q. WHAT IS THE RESULT YOU WOULD EXPECT IF THE LOAD GROWTH CURVE
18 WERE ADJUSTED UPWARD?

19 A. The result of increasing the load growth input would be a greater system need
20 occurring at an earlier point in time. Ms. Scheller points to no facts that
21 support adjusting the load growth curve to achieve this result.

22
23 Q. WAS THE FUEL PRICE ADJUSTMENT MADE BY MS. SCHELLER APPROPRIATE?

24 A. No. While Ms. Scheller does not explain whether the gas prices she used
25 were adjusted over the forecast years for annual or seasonal variations, I
26 presume they were not because she used a straight-line price forecast in her
27 calibration of the IPM model to Strategist. This appears contrary to Mr.

1 Weissman's testimony that the price of gas is volatile. Mr. Weissman testifies
2 that system cost modeling that fails to reflect likely price spikes within and
3 between forecast years is inherently flawed. Accounting for seasonal
4 variations is also important because more of our gas-fired generation is on
5 line in the summer months, when natural gas costs are typically lower than in
6 the winter months. We did not use straight-line projections of gas prices
7 within or between forecast years so the IPM modeling fails to account for the
8 varying impact of a key system cost in the same manner as Strategist does.

9
10 Q. DO YOU AGREE THAT THE CAPITAL COST ADJUSTMENTS BY MS. SCHELLER
11 WERE APPROPRIATE?

12 A. No. First, Ms. Scheller mistakenly assumed that our capital costs included
13 AFUDC. The capital costs we presented for our generic units were overnight
14 costs. The cost of AFUDC is calculated within the Strategist model itself,
15 based upon the company's capital structure, cost of capital and other factors.
16 To the extent that the new capital costs that were presented included
17 AFUDC, she would be double counting that amount, making the capital costs
18 too high. In addition, our generic costs are for the most part based upon
19 internal studies as well as bona fide bids and other current offers obtained for
20 constructing resources within Xcel Energy's service territory. Mr. Weissman
21 simply used costs of particular projects (such as Big Stone and SMMPA) that
22 may or may not be similarly situated to the projects that we considered. For
23 the combustion turbine generic, he arbitrarily inflated the price by 15%,
24 without showing the reasonableness of that assumption.

25
26 Q. WAS MS. SCHELLER'S ADJUSTMENT TO MESABA UNIT 1'S OUTAGE RATES
27 APPROPRIATE?

1 A. No. We asked Mesaba 1 LLC to provide us with the plant's availability
2 factors for the first four years, which translate to outage rates of 35%, 33.5%,
3 23%, and 13% respectively. Ms. Scheller, however, reduced these outage rates
4 to 5% per year. Artificially increasing the availability of the Mesaba plant to
5 meet an artificially increased system need will together reduce the cost of the
6 plant relative to the energy it produces, making it appear to be more
7 competitive with other resource options when it is not.

8
9 Q. WHAT IS THE SIGNIFICANCE OF THE IPM MODELING SHOWING THAT THE
10 MESABA 1 PPA AND RESOURCE PLAN PVRRS ARE ROUGHLY EQUAL?

11 A. Without support for the inputs and assumptions used in the IPM modeling, I
12 do not believe the conclusions drawn from the modeling are valid. The
13 modeling demonstrates that if: 1) the Xcel Energy system need was greater
14 than it is and occurred sooner than it does; and 2) the operational and capital
15 costs of generation alternatives to the Mesaba 1 PPA were higher than they
16 are; and 3) the Mesaba plant's availability to meet system needs was greater
17 than it is; and 4) the Mesaba 1 PPA actually resulted in the costs that Mesaba
18 1 LLC predicts; then the proposed PPA would appear to be a least-cost
19 resource option. As I discussed above, Ms. Scheller points to no facts that
20 justify adjusting all these inputs to achieve this result. This modeling fails to
21 support the conclusion that the Mesaba 1 PPA is or is likely to be a least-cost
22 resource.

23
24 **D. IPM Modeling of a High Gas Price Scenario**

25 Q. WHAT INPUT ADJUSTMENTS DID MS. SCHELLER MAKE IN THE IPM MODELING
26 OF A HIGH GAS PRICE SCENARIO?

1 A. Ms. Scheller included the load growth, capital cost, and outage rate
2 adjustments discussed above. She also further adjusted the gas price input
3 upward to \$14.00/MMBtu (real \$2006), based on information provided by
4 Mr. Weissman. Again she appears to have used this price as a straight-line
5 forecast, without adjusting it within or between forecast years as was done in
6 Strategist. Ms. Scheller also prevented the selection of any additional coal
7 generation in the Resource Plan scenario; in her other modeling of the
8 Resource Plan she did not place any such restriction. The resulting PVRRs
9 for this high gas price case were \$49.2 billion for the Resource Plan with no
10 additional coal allowed, and \$45.9 billion for the Mesaba 1 PPA.

11

12 Q. WHAT IS THE JUSTIFICATION FOR USING \$14.00/MMBTU THROUGHOUT THE
13 ENTIRE STUDY PERIOD?

14 A. I do not believe there is any support for this input. While Mr. Weissman
15 notes in his testimony that gas prices hit a \$14.00 peak on ten separate days in
16 2005, and one day hit \$15.39, nowhere does he explain why a dozen days of
17 gas prices at \$14.00 in 2005 should translate to a gas price forecast of \$14.00
18 for all days in the study period for the Mesaba 1 PPA. His proposal that a
19 straight-line forecast of \$14.00/MMBtu should be used as the appropriate
20 high gas price scenario is unsupported.

21

22 Q. HAS XCEL ENERGY MODELED THE IMPACT OF HIGH GAS PRICES ON ITS
23 SYSTEM COSTS UNDER THE RESOURCE PLAN VERSUS WITH THE MESABA 1 PPA
24 IN PLACE?

25 A. Yes. We increased the PIRA-based gas price forecast used in Strategist by
26 20%, which is the standard increase to assess the impact of high fuel costs in

1 resource planning for the Commission. The results are shown in Table 2
2 below.

3 **Table 2**

High Gas Price Scenario	Resource Plan	Mesaba 1 PPA	Mesaba 1 PPA PVRR vs. Resource Plan
Strategist PVRR (\$000)	\$35,180,051	\$36,675,091	+\$1,495,040 + 4.2%

4
5 With a 20% increase in the forecast of gas prices, the system PVRR under the
6 Resource Plan is still \$1.5 billion less than that for the Mesaba 1 PPA. The Mesaba
7 1 PPA continues to fail the least-cost, or likely-to-be least-cost, resource test.

8
9 **E. IPM Modeling Including Manitoba Hydro**

10 Q. WHAT OTHER IPM MODELING DID MS. SCHELLER DO?

11 A. Ms. Scheller modeled the PVRRs for the Resource Plan versus the Mesaba 1
12 PPA with the current 500 MW Manitoba Hydro PPA extended beyond its
13 2015 expiration date in both scenarios. The resulting PVRRs from the IPM
14 model were the same.

15
16 Q. WHAT IS THE SIGNIFICANCE OF THIS MODELING RESULT?

17 A. This IPM modeling included the same unsupported adjustments to load
18 growth, capital costs, and Mesaba Unit 1 availability, and used a gas price
19 forecast of \$7.67 (real 2007\$). This modeling only shows that using these
20 unsupported adjustments, extension of the Manitoba Hydro PPA does not
21 result in a different cost to the system. This modeling does not show that the
22 Mesaba 1 PPA is or is likely to be a least-cost resource, nor does it provide
23 useful information to making that determination.

24

1 Q. IS THE IPM MODELING OF AN EXTENDED MANITOBA HYDRO PPA
2 CONSISTENT WITH THE RESULTS YOU WOULD EXPECT?

3 A. No, it is not consistent with my expectations. I would expect an extension of
4 the Manitoba Hydro contract to result in an even lower PVRR for our
5 Resource Plan than with no Manitoba Hydro extension. In other words, the
6 modeling would show that the Mesaba 1 PPA is even more than \$1.5 billion
7 greater in cost than our Resource Plan if the Manitoba Hydro contract was
8 extended.

9

10 **F. Modeling of Environmental Externalities**

11 Q. MESABA 1 LLC CLAIMS THAT XCEL ENERGY ONLY INCLUDED A CARBON TAX
12 IN THE STRATEGIST MODELING, THEREBY MINIMIZING THE COST ADVANTAGE
13 THAT MESABA UNIT 1 SHOWS WHEN ENVIRONMENTAL EXTERNALITIES ARE
14 FULLY RECOGNIZED. WHAT IS YOUR RESPONSE?

15 A. As noted in my Direct Testimony, not only was a \$9/ton carbon tax included
16 in the Strategist modeling, but also the high and low environmental
17 externalities that the Commission has assigned to various emissions. Table 2
18 in my Direct Testimony showed that taking these mandated emission values
19 into consideration did not show that the Mesaba 1 PPA's cost premium over
20 the Resource Plan diminished. The PPA's PVRR over the Resource Plan
21 ranged from being \$1.5 to \$1.6 billion higher.

22

23

IV. CONCLUSION

24

25 Q. PLEASE SUMMARIZE YOUR SURREBUTTAL TESTIMONY.

26 A. The IPM model has not been calibrated to Strategist, and appears to operate
27 in a way that does not mimic Strategist. In addition, the input adjustments

1 that Ms. Scheller made in an attempt to model Xcel Energy system costs are
2 designed to increase the need for energy from Mesaba Unit 1, while at the
3 same time increasing the costs of alternative resource options. However, Ms.
4 Scheller has not provided facts to support these adjustments. Absent
5 sufficient support for the inputs, the IPM modeling cannot be relied upon to
6 conclude that the Mesaba 1 PPA is or is likely to be a least-cost resource. In
7 addition, Mesaba 1 LLC's criticisms of Xcel Energy's modeling are
8 unfounded.

9
10 Thus, after reviewing Mesaba 1 LLC's Rebuttal Testimony, and considering a
11 high gas scenario, I continue to conclude that the Mesaba 1 PPA is not, and is
12 not likely to be, a least-cost resource. Assuming the costs projected by
13 Mesaba 1 LLC in this proceeding are accurate, the Mesaba 1 PPA imposes
14 approximately \$1.5 billion in higher PVRR costs than our approved Resource
15 Plan. Costs may vary substantially from this estimate given that the price
16 terms of the Mesaba 1 PPA are not established and may change due to several
17 variables. The possible impacts of these risks should be considered when
18 evaluating the Mesaba 1 PPA.

19
20 Q. DOES THIS CONCLUDE YOUR SURREBUTTAL TESTIMONY?

21 A. Yes, it does.

<p>Mesaba 1 LLC Witness and Testimony</p>	<p>Surrebuttal Testimony of Elizabeth Engelking</p>
<p>T. Osteraas: Xcel Energy failed to include 144 MW of base load need for Flint Hills in establishing its total Minnesota system needs in its approved Resource Plan</p>	<p>The 144 MW needed for Flint Hills was included in the total base load need in our approved Resource Plan.</p>
<p>J. Cavicchi: The marked changes in the base load need identified in Xcel Energy’s resource plans since 2002 suggests that something is wrong with the process</p>	<p>Given the MERP plant conversions and upgrades approved by the Commission in 2004, and Xcel Energy’s planned upgrades to its Sherco/nuclear units in 2010-2012, one would expect the need analysis to change over this time period, not stay the same. Forecasts for load growth and the economics of various resource options have also been updated over the last four years, all of which impact need and the profile of an expansion plan to meet that need.</p>
<p>J. Cavicchi: Xcel Energy’s resource planning does not appear to be able to identify long lead-time coal-fired generation as an economical resource option</p>	<p>Our resource planning process properly accounts for the differences in the capital structures of generation units over time in selecting the least-cost option to meet an identified energy need. Specifically, Strategist recognizes that a unit that has high capital costs and low fuel costs, such as a coal-fired unit, could be a cheaper resource to meet future need over the course of its lifetime than a unit with lower capital costs and higher fuel costs, such as a gas-fired unit. Strategist takes this into account through its “end effects period” analysis, which extends the period for studying system need to determine which generation unit is truly least cost to meet an identified need within the study period.</p>
<p>J. Cavicchi: The PVRR values included in Ms. Engelking’s testimony for the Base Case and the High Externalities, Low Externalities, and combined Cycle vs. Mesaba-on-Gas Cases do not match Strategist outputs.</p>	<p>In all the scenarios Mr. Cavicchi’s calculations did not include the adjustments to short-term purchases that Xcel Energy made outside the model to accommodate excess capacity created by the Mesaba plant. The value of these adjustments vary from \$1.6 million to \$47 million depending on the expansion plan used in the analysis. Mr. Cavicchi made an additional error in calculating the PVRRs for the “No Mesaba” case. Instead of using the revenue requirements for the proposed upgrades at Prairie Island, Monticello, and Sherburne County facilities, Mr. Cavicchi apparently used the construction expenditures only. This led to an approximately \$100 million error in his PVRR calculations.</p>

<p style="text-align: center;">Mesaba 1 LLC Witness and Testimony</p>	<p style="text-align: center;">Surrebuttal Testimony of Elizabeth Engelking</p>
<p>M. Scheller: Xcel Energy did not provide information on out-of-model adjustments</p>	<p>The nature of out-of-model adjustments to Strategist were discussed in two telephone conferences with Mesaba 1 LLC consultants (Sept. 15 and 22, 2006), and the adjustments were detailed in response to Mesaba 1 LLC's Information Request No. 97 (served on Mesaba 1 LLC on Sept. 27, 2006).</p>
<p>R. Sass: Analysis of the percentage increases in forecasted gas prices in Xcel Energy's resource plans since 2002 provides a benchmark showing that the forecasts of future gas prices used in Strategist modeling in this proceeding are too low.</p>	<p>Ms. Sass has not pointed to any facts suggesting that an analysis of the differences in gas price forecasts in Xcel Energy resource plans over the last four years provides a valid benchmark for determining whether the PIRA-based gas price forecasts used in the Strategist modeling in this proceeding are too low. Ms. Sass's credentials also do not show that she has any expertise in assessing gas price forecasting methodologies or opining on what gas prices are likely to be 5, 10, 15, or 20 years from now.</p>
<p>A. Weissman: The gas price forecasts Xcel Energy used in its Strategist modeling are too low.</p>	<p>Mr. Weissman has not seen the PIRA-based gas price forecasts used in the Strategist modeling in this proceeding, nor does he point to any facts that support a claim that they are too low.</p>
<p>R. Volk: Xcel Energy's estimate of \$1864/kW for the capital cost of Sherco 4 appears low, and O&M costs less than \$18/kW-year are not consistent with total operating costs.</p>	<p>The Sherco numbers did not include AFUDC, which is calculated within the Strategist model. The O&M costs for Sherco are lower than for other base load facilities because of the ability to share O&M with the other three Sherco units on the site.</p>