

**MPUC Docket No. E-6472/M-05-1993**  
**OAH Docket No. 12-2500-17260-2**

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BEFORE THE  
MINNESOTA OFFICE OF ADMINISTRATIVE HEARINGS  
100 Washington Square, Suite 1700  
Minneapolis, Minnesota 55401-2138

FOR THE  
MINNESOTA PUBLIC UTILITIES COMMISSION  
127 7th Place East, Suite 350  
St. Paul, Minnesota 55101-2147

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In the Matter of the Petition of Excelsior Energy Inc.  
and Its Wholly-Owned Subsidiary MEP-I, LLC For Approval of Terms and  
Conditions For The Sale of Power From Its Innovative Energy Project Using  
Clean Energy Technology Under Minn. Stat. § 216B.1694 and a  
Determination That the Clean Energy Technology Is Or Is Likely To Be a  
Least-Cost Alternative Under Minn. Stat. § 216B.1693

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**PREPARED SURREBUTTAL TESTIMONY OF  
EXCELSIOR ENERGY INC. AND MEP-I LLC**

**ROBERT S. EVANS II**

**OCTOBER 31, 2006**

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1           Scope and Summary

2   **Q       What is the purpose of your Surrebuttal Testimony in this proceeding?**

3   A           The purpose of my surrebuttal testimony is to respond to the rebuttal testimony  
4           of MCGP witnesses Ronald D. Rich and Edwin Anderson, M.D., Minnesota Power  
5           witness Margaret L. Hodnik, and Department of Commerce witness Eilon Amit, PhD as  
6           such testimony pertains to the following matters:

- 7           • Ronald D. Rich

8           I will respond to Mr. Rich’s incorrect assertions that (1) Mesaba One and  
9           Mesaba Two will contribute more CO<sub>2</sub> to the atmosphere than any other coal  
10          plant in Minnesota and (2) the amount of CO<sub>2</sub> emitted from Mesaba is unknown  
11          and that the reduction in CO<sub>2</sub> associated with Mesaba without CO<sub>2</sub> capture is  
12          trivial relative to an SCPC plant with the same net MW output.

- 13          • Edwin Anderson, M.D.

14          I will address Dr. Anderson’s incorrect assertions that the comparison provided  
15          as part of ICF’s modeling study is false, diversionary, and misleading, and that  
16          Excelsior has failed to provide the specific increase in health risk for people  
17          living nearby the Project. Other inaccurate statements made by Dr. Anderson  
18          regarding the modeling conducted by ICF are addressed in the surrebuttal  
19          testimony of Excelsior witness Baxter Jones.

- 20          • Margaret L. Hodnik

21          I will respond to Ms. Hodnik’s incorrect assertions that an IGCC plant in  
22          Northeastern Minnesota has no realistic opportunity for carbon capture and  
23          storage, her inappropriate reference to such opportunities as a “pipe dream,” her

1 inaccurate interpretation of Mr. Cashin’s direct testimony, the irrelevance of the  
2 statement regarding the comparison of IGCC and an SCPC plant on the basis of  
3 uncontrolled and controlled emissions, and her statement regarding the impact  
4 of Mesaba One and Two on increment consumption in Northeastern Minnesota.

- 5 • Elion Amit, PhD

6 I will respond to Dr. Amit’s incorrect statement regarding Excelsior’s lack of  
7 plans regarding sequestration of CO<sub>2</sub>, his mistaken impression that the cost of  
8 pipeline would necessarily have to be borne solely by Excelsior, and his short-  
9 sighted representation that CO<sub>2</sub> sequestration represents the sole advantage of  
10 IGCC over conventional coal technologies.

11 Response to the Rebuttal Testimony of Ronald Rich

12 **Q Mr. Rich claims in his rebuttal testimony at page 2 that Mesaba Phase I and II as**  
13 **designed will emit more CO<sub>2</sub> to the atmosphere than any other coal plant in**  
14 **Minnesota. Is this true?**

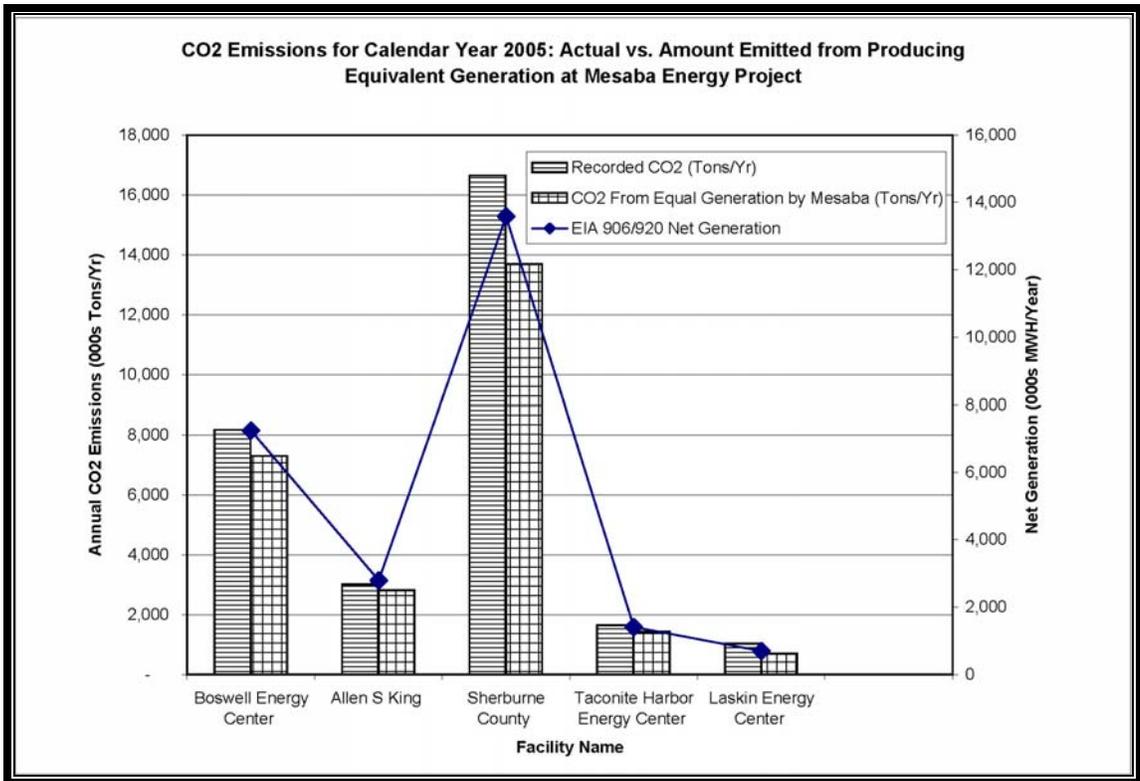
15 **A** No. According to data available on the U.S. Environmental Protection Agency’s  
16 (“U.S. EPA”) Clean Air Markets web site<sup>1</sup> Northern States Power Company’s  
17 Sherburne County Generating Plant (“Sherco”) in 2005 emitted 16,657,713 tons of CO<sub>2</sub>.  
18 At a 90% capacity factor, CO<sub>2</sub> emissions from Mesaba One and Mesaba Two combined  
19 would total approximately 9,632,000 tons. In addition to being untrue, Mr. Rich’s  
20 statement also misses the point: measuring the ratio of CO<sub>2</sub> emitted to energy produced  
21 is a more effective measure of the plant’s overall resource efficiency and impact on  
22 Minnesota than a simple measure of bulk emissions. According to this more accurate

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<sup>1</sup> See [http://cfpub.epa.gov/gdm/index.cfm?fuseaction=emissions.wizard&EQW\\_datasetSelection=](http://cfpub.epa.gov/gdm/index.cfm?fuseaction=emissions.wizard&EQW_datasetSelection=)

1 measurement, Mesaba One and Two combined emit less CO<sub>2</sub> for every hour of energy  
 2 produced than Minnesota's other large coal facilities. Figure RSE-S1 shows the CO<sub>2</sub>  
 3 emissions that Mesaba One and Mesaba Two would emit if together they generated an  
 4 equal amount of electricity as Sherco did in 2005; other Minnesota facilities are also  
 5 shown in this figure.<sup>2</sup>

6 **Figure RSE-S1**



7  
 8 Figure RSE-S1 shows that for any of the Minnesota plants, fewer CO<sub>2</sub> emissions would  
 9 have been produced by the Mesaba Energy Project in generating the same amount of  
 10 electricity.

<sup>2</sup> Net generation for calendar year 2005 obtained for Minnesota generating plants from [http://www.eia.doe.gov/cneaf/electricity/page/eia906\\_920.html](http://www.eia.doe.gov/cneaf/electricity/page/eia906_920.html).

1 **Q Mr. Rich at page 7 claims the amount of CO<sub>2</sub> that the Mesaba Energy Project**  
2 **would generate is unknown. Do you agree with this claim?**

3 A.. No. Mr. Rich appears to reference a section of Excelsior's Joint Application to  
4 the Minnesota Public Utilities Commission and states that the text references a chart  
5 with values for carbon monoxide instead of CO<sub>2</sub>. In fact, this section of the Joint  
6 Application (Section 3.4.1.4) provides Figure 3.4-3, which shows the CO<sub>2</sub> emission rate  
7 from the Mesaba Energy Project (in terms of pounds per megawatt-hour) for two  
8 different fuel sources. It would be fairly simple to derive the annual emissions at any  
9 capacity factor by multiplying the emission rate by the net capacity of the unit (for  
10 Mesaba One equivalent to 606 MW<sub>(net)</sub>) by the hours in the year corresponding to such  
11 capacity factor. The following example provides the calculation assuming a 90%  
12 capacity factor.

$$\text{Annual CO}_2 \text{ emissions (Tons/Yr)} = \frac{(606 \text{ MW}) * (2016 \text{ lbs/MWh}) * (8760 \text{ Hours/Yr}) * (0.9)}{2,000 \text{ lbs/Ton}}$$

14 I believe Mr. Rich has confused the reference to Figure 3.4-3 in Section 3.4.1.4 with  
15 Table 3.4-3, the latter of which contains emissions of carbon monoxide along with other  
16 criteria air pollutants.

17 Response to the Rebuttal Testimony of Edwin Anderson, M.D.

18 **Q In his rebuttal testimony, Dr. Anderson repeatedly states that the comparison**  
19 **made between the Mesaba Energy Project and a central Minnesota generating**  
20 **alternative is false, misleading and diversionary. Do you agree?**

21 A No. In this regard, my rebuttal testimony at pages 6 and 10–21, speaks for itself;  
22 the comparison is valid. Excelsior witness Baxter L. Jones, in his surrebuttal testimony

1 at page 3, provides evidence that such comparisons are routinely made in evaluating the  
2 risks between two scenarios, neither of which represents zero risk.

3 **Q At page 5 of his rebuttal testimony, Dr. Anderson states that there is no coal plant**  
4 **to be built that Mesaba [sic] will be replacing and no existing coal plant that will be**  
5 **closed if Mesaba [sic] is built. Do you agree?**

6 A No. To pretend that the baseload electric power produced by Mesaba One and  
7 Mesaba Two would not ultimately be produced by some other coal-fueled power plant  
8 is naïve and ignores Minnesota utilities' published intent. For example, the following  
9 Minnesota utilities/power agencies in need of baseload coal power have signed up to  
10 participate in the Big Stone II Power Plant to be constructed near the South  
11 Dakota/Minnesota border: Ottertail Power, Great River Energy, Southern Minnesota  
12 Municipal Power Agency, and Central Minnesota Municipal Power Agency (*see* MPUC  
13 Docket. No. CN-05-619; MPUC Docket. No. TR-05-1275). In addition, in my rebuttal  
14 testimony at pages 6–7, I discuss the Department of Commerce's analysis of a  
15 hypothetical baseload coal-fueled power plant for NSP based on NSP's identification of  
16 such a unit as a likely baseload coal alternative.

17 **Q In his testimony at page 2, Dr. Anderson states that Excelsior should describe the**  
18 **specific increase in health risk for people nearby the plant. Has Excelsior**  
19 **undertaken such studies?**

20 A Yes. As part of its application for a New Source Review Construction  
21 Authorization (the PSD Permit Application), Excelsior prepared an Air Emission Risk  
22 Analysis (“AERA”) as directed by the Minnesota Pollution Control Agency. The  
23 preliminary results of this analysis have been submitted and are made available on

1 Excelsior’s web site<sup>3</sup>. The AERA evaluates the risks associated with air toxics  
2 emissions from Mesaba One and Mesaba Two.

3 **Q What were the results of the AERA?**

4 A The results showed that all cancer and non-cancer risks were below thresholds  
5 of concern for all chemicals of potential concern. The summary of the AERA is  
6 presented on page 23 of that document.

7 Response to the Rebuttal Testimony of Margaret L. Hodnik

8 **Q Ms. Hodnik makes the following statement at page 6 of her testimony: “an IGCC**  
9 **plant in Northeastern Minnesota has no realistic opportunity for carbon capture**  
10 **and storage;” as well as the following additional statement at page 14: “At this**  
11 **point, CO<sub>2</sub> sequestration and storage in the Mesaba Project is a pipe dream.” Do**  
12 **you agree?**

13 A No. Excelsior witness Stone in his rebuttal testimony has provided a copy of the  
14 company’s Plan for Carbon Capture and Sequestration that lays out for the Mesaba  
15 Energy Project the fundamental decisions required to undertake carbon capture and  
16 sequestration. In addition, Excelsior witness Steadman has stated in his rebuttal  
17 testimony at pages 42–43 that pipeline costs can be partially borne by entities that will  
18 be conducting enhanced oil recovery (“EOR”) operations. In addition, Mr. Steadman  
19 states in his surrebuttal testimony that carbon capture and sequestration is likely to be  
20 technically feasible and realistic. *See* Surrebuttal Testimony of Edward N. Steadman,  
21 at 12. On page 61 of his rebuttal testimony, Steadman states that commercial CO<sub>2</sub>

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<sup>3</sup> See page 543 through page 625 of the PSD Permit Application provided at the following link:  
[http://www.excelsiorenergy.com/pdf/Permit\\_Apps/Construction%20Authorization%20Permit%20Application%20for%20Web.pdf](http://www.excelsiorenergy.com/pdf/Permit_Apps/Construction%20Authorization%20Permit%20Application%20for%20Web.pdf)

1 capture technologies are currently available that can capture the CO<sub>2</sub> produced by the  
2 Mesaba plant.

3 In summarizing his rebuttal testimony, Steadman states in his second bulleted  
4 point that the current shortage of CO<sub>2</sub> available for EOR activities may represent an  
5 advantage to the Mesaba Energy Project. *See* Rebuttal Testimony of Edward N.  
6 Steadman, at 62. The CO<sub>2</sub> produced by facilities such as the Mesaba Project will be  
7 highly sought after as long as the EOR opportunities remain, producing a product  
8 revenue stream that can potentially recoup the costs of separation and capture,  
9 compression, and pipeline transportation for many years.

10 **Q Ms. Hodnik reiterates Minnesota Power witness Cashin’s direct testimony related**  
11 **to the comparisons between uncontrolled and controlled emissions for an SCPC**  
12 **plant and for the Mesaba Energy Project. Is this appropriate?**

13 A No, for the reasons expressed in my rebuttal testimony at pages 20–21.  
14 Regarding a measure of environmental performance in terms of criteria pollutant  
15 emissions, Hodnik and Cashin downplay the environmental superiority of IGCC as  
16 insignificant, because the difference between the total emissions avoided using IGCC  
17 and the total avoided with an SCPC plant is “just a few percent.” The choice of an  
18 unrealistically high baseline value for comparison (i.e., uncontrolled emissions) ignores  
19 the fact that what comes out the stack is important and obscures important and  
20 significant differences in the relative environmental performance of the two  
21 technologies. Any entity attempting to permit a new coal-fueled power plant will attest  
22 to this fact. For example, while a conventional coal plant’s 94% removal rate of SO<sub>2</sub> on  
23 a particular feedstock may appear at first glance to be nearly as good as IGCC’s 98%

1 removal rate on the same feedstock, the difference corresponds to the conventional coal  
2 plant emitting three times the amount as IGCC.

3 **Q Ms. Hodnik states that MP has filed testimony that the environmental benefits to**  
4 **be achieved via pollutant reductions from the Mesaba Energy Project are**  
5 **insignificant compared to the benefits achieved via reductions using modern**  
6 **supercritical pulverized coal-fired technology. Do you agree?**

7 A No. First, neither Ms. Hodnik nor any other MP witness has provided  
8 information to support this claim. Second the example of a modern supercritical  
9 pulverized coal plant provided in MP's testimony was that of Big Stone Unit II. In my  
10 rebuttal testimony at page 19, I compare the criteria pollutant emissions from Big Stone  
11 Unit 2 with those of the Mesaba Energy Project. On the basis of such differences, many  
12 entities are finding it difficult to permit such plants. In such cases, it would be hard to  
13 convince the entities involved that the differences in emission profiles were irrelevant.

14 **Q At page 15 of her testimony, Ms. Hodnik references the consumption of regional**  
15 **air increment by the Mesaba Energy Project as a permitting concern for existing**  
16 **and new industries in the vicinity. Will this issue be addressed within the context of**  
17 **the permitting processes?**

18 A Yes. Excelsior has submitted an application for a New Source Review  
19 Construction Authorization permit that has set in motion such investigations.

20 Response to the Rebuttal Testimony of Eilon Amit, PhD.

21 **Q Have you examined Section V of Dr. Amit's rebuttal testimony, entitled**  
22 **"Sequestration of Carbon Dioxide (CO<sub>2</sub>)"?**

23 A Yes.

1 **Q Dr. Amit observes that, while the Mesaba Plant could accommodate facilities to**  
2 **capture or sequester CO<sub>2</sub>, “Excelsior did not provide any specific plans regarding**  
3 **sequestration of CO<sub>2</sub>.” Does Excelsior have a plan for the potential sequestration**  
4 **of carbon from Mesaba Unit 1?**

5 **A** Yes. Excelsior’s Plan for Carbon Capture and Sequestration has been submitted  
6 as an exhibit to Excelsior witness Richard Stone’s rebuttal testimony.

7 **Q Dr. Amit concludes on page 22 of his rebuttal testimony that “[w]ithout**  
8 **sequestration of CO<sub>2</sub> the environmental benefits of the Excelsior proposed plant**  
9 **may not be significant in comparison to a supercritical coal plant.” What is your**  
10 **response to this assertion?**

11 **A** The potential benefits of IGCC associated with its capability to immediately  
12 capture a significant portion of the carbon present in its incoming feedstock is a distinct  
13 advantage when considering whether sequestration is feasible and realistic. However, to  
14 focus on this alone disregards the superior overall environmental profile of IGCC as it  
15 applies to the simultaneous control of all criteria air pollutant emissions, the cost-  
16 efficient capture of mercury across a diverse set of feedstocks, the complete utilization  
17 of its slag and sulfur by products, the high thermal efficiency it offers across a diverse  
18 range of feedstocks, its ability to serve as a hedge against future regulatory control  
19 initiatives, its relevance in demonstrating the commercialization of IGCC and a  
20 meaningful step in the transition to a hydrogen economy, and its capability for reducing  
21 water usage requirements. All told, these would seem to represent highly significant  
22 advantages the likes of which cannot be matched by supercritical coal plant technology.

1           In summary, I find the statement overlooks many of the significant environmental  
2           advantages of IGCC.

3   **Q       Does this conclude your surrebuttal testimony?**

4   **A           Yes.**