PUBLIC VERSION

MESABA ENERGY PROJECT

REPORT TO THE MINNESOTA PUBLIC UTILITIES COMMISSION

SECTION III

COST ANALYSIS AND COMPARISON

EXCELSIOR ENERGY INC.

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This Section III provides detailed analysis of the cost to the ratepayers of the capacity and energy from Unit One of the Mesaba Project ("Mesaba One"), as reflected in the tariff provided for in Article 8 of the Power Purchase Agreement (the "PPA"). The PPA is included as Section V of this Report.

In addition, this Section III compares the costs under the PPA to the costs to the ratepayers of an alternative equivalent size (600 MW (net)) supercritical pulverized coal (SCPC) plant with a complete suite of emission control technologies, as constructed and rate-based by a utility.

SUMMARY OF FINDINGS

On a direct tariff basis (PVRR/MWh), the cost of electricity from the Mesaba Project is [*Trade Secret Data Begins*] [*Trade Secret Data Ends*] than the cost of electricity from the SCPC unit (*See* Figure 1 below), with a cost delta of [*Trade Secret Data Begins*] [*Trade Secret Data Ends*].

Figure 1: IGCC - SCPC – Comparative Electricity Cost – PVRR (in 1,000$)

[*Trade Secret Data Begins*]

[*Trade Secret Data Ends*]

This direct cost comparison is set forth in greater detail in Subsection C below.

As analyzed in detail in Subsections D and E below, when taking into account the quantified social costs related to environmental externalities (including quantified values for fine particulate matter provided to Excelsior in a detailed expert report by ICF Consulting, attached as Exhibit D to this Report), the cost of electricity from Mesaba One is [*Trade Secret Data Begins*] [*Trade Secret Data Ends*] than the comparable costs from the SCPC plant (see Figure 2 below).

Figure 2: IGCC - SCPC – Comparative Electricity Cost – PVSC with National PM 2.5 Costs (in 1,000$)

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[*Trade Secret Data Ends*]

The factors described in Subsection F further increase IGCC's advantage over other coal-based alternatives.

COMPARISON METHODOLOGY

In order to present a valid comparison:

i The basis for the analysis of both alternatives must be comparable, including the time period for the analysis and the analysis must be presented on a cost per MWh basis.

ii A complete and accurate set of direct costs must be considered – in the case of a PPA, the tariff reflects all such costs - but for cost of service proposals, all costs must be carefully identified, estimated and included in the Present Value of Revenue Requirement (PVRR) calculation.

iii All material assumptions and inputs into the cost calculations should be consistent and scrutinized for reasonableness.

iv All non-tariff and non-cash costs must be considered and quantified as well, in order to calculate a total Present Value of Social Costs (PVSC) calculation.

In Subsection A below, the direct cost of electricity produced by Mesaba One and reflected by the PPA tariff is calculated and analyzed in detail. Subsection B provides a summary of the direct cost of electricity from a SCPC plant. The basis for the analysis in Subsection B is the Excelsior Technology Report and Excelsior Technology Report Addendum prepared by Fluor in December, 2005 (the "Fluor Report"), attached as Exhibits F and G to this Report. Because unprecedented shifts are occurring in the construction industry, the comparison is based on current data that reflects very recent changes in construction market fundamentals.

The comparison that follows in Subsections C through E puts the two alternatives on an even footing, factoring in all direct and indirect costs of power production, using a comparable analysis horizon, and making comparable and high likelihood base case assumptions on all forecast inputs. A twenty-five year analysis was utilized and it was assumed that both units would come on line in October 31, 2011.

Subsection C provides a cost comparison of the direct tariff costs associated with each alternative. Subsection D considers the addition of Minnesota Externality Values and Subsection E considers the addition of quantified values for fine particulate matter.

All calculations of PVRR are divided by total megawatt hours (MWh) produced in order to develop a truly comparable figure (PVRR/MWh) as a basis for the analysis. After analyzing the present value of revenue requirements per megawatt hour of output, additional non-tariff and non-cash costs are considered and quantified, in order to calculate the full present value of social costs (PVSC) per MWh of each alternative.

Finally, certain additional economically valuable project benefits that are not reflected in the quantified benefits are described in Subsection F to this Section III. These factors described in Subsection F further increase IGCC's advantage over other coal-based alternatives.

ANALYSIS

A. Mesaba Project – Direct Price of Electricity

In the analysis of the price of electricity from the Mesaba One, two key sets of data are relevant: (i) the tariff provided for in the Power Purchase Agreement; and (ii) key variables and assumptions regarding macroeconomic conditions and plant performance that affect the costs and output from the facility.

1. Tariff Inputs

Provided below on Table 1 are the key pricing inputs from the Power Purchase Agreement:

Table 1: Summary of Contract Terms

	Input Amount	**Basis**
Length of Contract	25	Years
[*Trade Secret Data Begins*]		
		[*Trade Secret Data Ends*]
Scheduled Maintenance Energy (SME)	Detailed SME data is provide in the PPA; this level of SME equates to an average of 5% of all available hours per year	MWh
Reference Capacity	603	MW

2. Key Assumptions

Outlined on Table 2 and Table 3 below are the key macroeconomic and project assumptions used in the development of the base case pricing forecast for Mesaba One. It should be noted that the assumptions in Table 2 are consistent with those used by Fluor in their analysis of the SCPC plant.

Table 2: Macroeconomic and Market Variable

	Assumption	**Comment**	**Impact**
Inflation (Construction Costs)	2.5%	Based on current general market forecast and consistent with assumptions Fluor used in SCPC analysis	Affects calculation of Target and Final EPC Contract Price
Inflation (GDPIPD)	2.5%	Based on current general market forecast and construction with assumptions in Fluor used in SCPC analysis; also consistent with ICF	Effects forecasted Variable and Fixed OM Payments
[*Trade Secret Data Begins*]			
			[*Trade Secret Data Ends*]

Table 3: Project Specific Assumptions

	Assumption	Comment	Impact
Commercial Operation Date (per Contract)	October 31, 2011	No benefit from earlier possible start-up of combined cycle power island is assumed	Start of production/ sales under the contract
[*Trade Secret Data Begins*]			
			[*Trade Secret Data Ends*]

A key set of assumptions utilized in the determination of the Mesaba One tariff are those related to the capital structure of the company. The Financing Plan set forth in Section IV of this Report, provides a description of the current activities and plans for the financing of Mesaba One. Base interest rates [*Trade Secret Data Begins*

[*Trade Secret Data Ends*] will be locked in for the entire term of the PPA. Mesaba One benefits from a lower cost of energy afforded by the availability of Federal loan guarantees provided for in the 2005 Energy Policy Act, as well as the expected utilization of the Federal investment tax credit program.

3. Electricity Cost

Mesaba One produces a tariff that is fairly level on a nominal basis (Figure 3 below), and decreases on a real (2005 dollars) basis (Figure 4 below). With a relatively small part of the price linked to indices such as inflation, and an even smaller portion of the tariff linked to the fuel markets, the price volatility (and possible magnitude of price increases) is very low, as compared to plants fueled by natural gas. Additionally, the fuel flexibility of the plant will allow Mesaba Project to further optimize its fuel procurement in order to provide a greater level of risk mitigation than conventional plants.

On average, the marginal price of electricity from Mesaba One is expected to be [*Trade Secret Data Begins*] [*Trade Secret Data Ends*] cents/kWh, making it one of NSP's resources with the lowest marginal cost, and thus one with the highest dispatch.

Figure 3: Mesaba One - Annual Forecasted Tariff (Nominal Basis)

[*Trade Secret Data Begins*]

[*Trade Secret Data Ends*]

Figure 4: Mesaba One - Annual Forecasted Tariff (Real Basis-2005 dollars)

[*Trade Secret Data Begins*]

[*Trade Secret Data Ends*]

B. SCPC Plant – Direct Price of Electricity

In order to provide the Commission and stakeholders with comparative cost information from a conventional coal alternative, Excelsior commissioned Fluor to perform a detailed cost analysis of a comparable SCPC power plant, constructed and owned by a utility and located in Minnesota. *See* Fluor Reports attached as Exhibits F and G to this Report.

This study provides a detailed and accurate comparative benchmark, as it:

- Considers the actual power plant construction costs (including commodity and labor) existing in today's (third quarter 2005) market, which differs markedly from the outdated and generic information that is quoted in industry publications and generic studies.

- Includes the capital and operating costs for appropriate emission control technologies, including wet scrubbers, selective catalytic reduction, and mercury removal that would be a starting point for the permitting of a SCPC plant in Minnesota.

- Accounts for the full costs of power plant construction, including coal delivery facilities, transmission interconnects, and other site amenities, along with costs for development, permitting and engineering, which are generally excluded from preliminary price quotes but increase the final cost of power.

- Takes into account the actual costs of doing business in Minnesota, including data from a detailed Labor Survey.

- Uses NSP's specific cost of capital as a basis for the utility capital structure.

The Fluor Report provides a calculation of electricity costs, per year from a utility owned SCPC plant. It also calculates the PVRR of electricity costs, and PVRR/MWh.

Figure 5 provides a summary of the electricity cost information from the Fluor Report

Figure 5: SCPC - Annual Forecasted Tariff (Nominal Basis)

[*Trade Secret Data Begins*]

[*Trade Secret Data Ends*]

C. Direct Cost Comparison - Mesaba Project to SCPC Plant (PVRR)

In summary, the "as built" capital costs of the two plants are estimated (in 2005 dollars) at [*Trade Secret Data Begins*] [*Trade Secret Data Ends*] for the utility owned SCPC and [*Trade Secret Data Begins*] [*Trade Secret Data Ends*] for the Mesaba One IGCC facility. The initial, upfront capital costs for IGCC [*Trade Secret Data Begins*] [*Trade Secret Data Ends*] to the cost of building a SCPC plant. The forecasted additional capital costs that are required to meet changing emission limits or to capture carbon are not included, which would more than eliminate this cost delta.

Installed capacity cost is a key component of the revenue requirements for a facility. In order to calculate the cost of output from both alternatives, all capital, financing and operating costs and assumptions must be factored into the analysis. It is then possible to compare the total cost of a utility owned SCPC plant to the tariff proposed for Mesaba One on a PVRR/MWh basis. As reflected in Figure 6, the initial, direct cost of electricity of Mesaba One is [*Trade Secret Data Begins*] [*Trade Secret Data Ends*] the cost of electricity from the utility-owned SCPC unit, with a gap of less than [*Trade Secret Data Begins*] [*Trade Secret Data Ends*] %.

Figure 6: IGCC - SCPC – Comparative Electricity Cost – PVRR (in 1,000$)

[*Trade Secret Data Begins*]

[*Trade Secret Data Ends*]

D. Cost Comparison including Minnesota Externality Values - Mesaba Project to SCPC Plant (PVSC)

In Figure 7, the PVRR/MWh for each facility was adjusted to include the Minnesota approved High Externality values for PM10, CO, NOx, Pb, and CO_2 pollutants to determine the PVSC/MWh of each alternative.

Minnesota has established externality values associated with criteria pollutant emissions. The development of these costs was based on evidentiary hearings that spanned almost three years and involved more than twenty-three stakeholders. An independent study sponsored by NSP formed the basis for the final costs (in 1995 dollars) that were accepted in the Public Utilities Commission Order issued January 3, 1997. Minnesota was one of only seven states nationally to "succeed" in quantifying such costs. The costs – in dollars per ton of pollutant emitted – were based on a bottom-up damage-cost assessment methodology that involved four steps: (i) estimating future pollutant emissions, (ii) quantifying ambient impacts associated with the spatial and temporal distribution of emissions (i.e., atmospheric transport, transformation and deposition), (iii) applying the results of accepted dose-response studies to the environmental elements impacted by such emissions, and (iv) monetizing the direct and inferred impacts.

The externalities and values included in this analysis represent published values from 2004 that have been escalated to 2005 dollars. The specific values (in 2005 dollars) used are:

PM10	$1,031 / Ton
CO	$0.49 / Ton
NOx	$123 / Ton
Pb	$540 / Ton
CO2	$3.74 / Ton

When Minnesota externality values are included in the calculations of the PVSC/MWh of the plants, the cost of the Mesaba One IGCC plant is [*Trade Secret Data Begins*] [*Trade Secret Data Ends*] than the cost of a utility owned SCPC plant. This comparison is represented in Figure 7 below. This comparison demonstrates that the Minnesota externality values [*Trade Secret Data Begins*] [*Trade Secret Data Ends*] the IGCC emissions are roughly two-thirds less than those of the SCPC alternatives.

Figure 7: IGCC - SCPC – Comparative Electricity Cost – PVSC with MN Externalities (in 1,000$)

[*Trade Secret Data Begins*]

[*Trade Secret Data Ends*]

E. Cost Comparison With PM 2.5 - IGCC to SCPC Plant (PVSC) (in 1,000$)

The costs related to PM 2.5 are not taken into account in the Minnesota externality values. Section IV and Exhibit D of this Report describe in detail and quantify the PM 2.5 costs that will impact the cost of generation from Mesaba One and any SCPC alternative.

In Figure 8, the PVSC of the Minnesota costs for PM 2.5 from each unit were added to the previously determined costs. When the in-state costs of PM 2.5 are factored in, the cost of electricity from Mesaba One is [*Trade Secret Data Begins*] [*Trade Secret Data Ends*] the comparable costs from the SCPC plant.

Figure 8: IGCC - SCPC – Comparative Electricity Cost – PVSC with PM 2.5 Costs in Minnesota (in 1,000$)

[*Trade Secret Data Begins*]

[*Trade Secret Data Ends*]

Figure 9 depicts the PVSC when the National costs for PM 2.5 from both alternatives are considered. If these costs are internalized, the cost of electricity from Mesaba One is [*Trade Secret Data Begins*] [*Trade Secret Data Ends*] the comparable costs from the SCPC plant.

Figure 9: IGCC - SCPC – Comparative Electricity Cost – PVSC with National PM 2.5 Costs (in 1,000$)

[*Trade Secret Data Begins*]

[*Trade Secret Data Ends*]

F. Qualitative Analysis of Other Cost Considerations

Other features of the Project will result in lower delivered power costs from the Project. These include carbon capture flexibility, reduction of ratepayer risks through the PPA structure, the benefits of a 2011 in-service date, and transmission benefits that have been quantified by ICF Consulting but not included in the analysis above.

1. CARBON CAPTURE.

The cost of carbon capture significantly increases the cost advantage of IGCC generation over traditional technologies.

The cost of carbon capture is likely to increase the cost of generation from a SCPC plant significantly more than it will impact the cost of generation from an IGCC plant. This is true because carbon can be cost-effectively captured from an IGCC plant, prior to combustion. In contrast, the only identified technology path for carbon capture from a SCPC boiler technology is post-combustion scrubbing of a very large volume of flue gas, which is a capital and energy intensive proposition, and technologically uncertain.

Section II of this Report provides an analysis of the likelihood that carbon emissions will have to be controlled in the planning horizon for new base load coal additions. The growing consensus is that the flexibility to capture carbon alone is sufficient to justify at least a

twenty percent cost differential between IGCC and conventional technologies. Mesaba One is being designed to be carbon capture ready (*see* Section IV of this Report).

2. RATEPAYER RISK REDUCTION.

The cost quantification above does not reflect the value of shifting risks from the ratepayers to the Mesaba Project sponsor provided by a PPA structure, which is an advantage over the utility cost-of-service SCPC plant used as the alternative SCPC plant in the previous quantitative analysis. Some of the benefits of the PPA structure to ratepayers are analyzed in Section VI of this Report.

3. EARLY IN-SERVICE DATE.

In addition, the quantitative analysis does not reflect the value of Mesaba One's projected 2011 in-service date over the 2015 date that the utilities in the State have concluded is the probable in-service date for any conventional coal alternative. As discussed in Sections I and II of this Report, any increment of new coal-fueled generation will reduce ratepayer dependence on natural gas, and therefore provide a hedge against the volatility of natural gas prices. The value of this "gas volatility hedge" has not been included in the quantitative analysis of this Section III. The Mesaba Project benefits from having been under development since 2001, and from the exemption from certificate of need for generation and transmission associated with the Mesaba Project facilities. Mesaba can be in-service before any other coal alternative.

4. TRANSMISSION BENEFITS.

The quantitative analysis does not reflect the value of Mesaba One's transmission benefits, which translate into substantial savings for both Xcel's customers and other utility customers in Minnesota. *See* Exhibit H, ICF's Transmission Report for a description of these savings to consumers.

CONCLUSION

In summary, the quantitative and qualitative factors included in this analysis confirm that the Mesaba Project will be a least cost energy resource to Xcel and the State of Minnesota.