



**Implementation of MOF Recommendation Paper
Stakeholder Comment Form**

Comments From: Canadian Natural Resources Ltd.
 Date: April 16, 2009
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1. WIND POWER FORECASTING – Centralized Forecasting Model	
The AESO recommends that a centralized forecasting model be implemented in Alberta.	<input type="checkbox"/> Support <input type="checkbox"/> Oppose <input checked="" type="checkbox"/> Indifferent
<u>Reasons for Stakeholder Position:</u>	
2. WIND POWER FORECASTING – RFP ASAP	
The AESO recommends that solicitation (RFP), evaluation and selection of a centralized forecasting service provider should proceed as soon as practicable.	<input type="checkbox"/> Support <input type="checkbox"/> Oppose <input checked="" type="checkbox"/> Indifferent
<u>Reasons for Stakeholder Position:</u>	
3. WIND POWER FORECASTING	
The AESO will commence consultation on rules, procedures, standards and technical requirements regarding submission of wind generator forecast data/information including; data requirement such as turbine availability and on-site meteorological data, communication protocols, and data quality required from wind generation facilities (or individual forecasters) to deliver forecasts to the AESO.	<input type="checkbox"/> Support <input type="checkbox"/> Oppose <input checked="" type="checkbox"/> Indifferent
<u>Reasons for Stakeholder Position:</u>	
4. WIND POWER FORECASTING – Data Management	
As part of its forecasting research and development work, the AESO will continue work to determine the capability, resources, systems and time required to perform the data management function. In parallel, the AESO will include data management as an optional requirement in the wind forecasting RFP.	<input type="checkbox"/> Support <input type="checkbox"/> Oppose <input checked="" type="checkbox"/> Indifferent
<u>Reasons for Stakeholder Position:</u>	
5. FORECASTING ACCURACY	
The AESO will monitor forecasting, market and operational results and develop measures of forecasting accuracy. The AESO intends to leverage available data and forecasting	<input type="checkbox"/> Support <input type="checkbox"/> Oppose



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resources toward this end.	X Indifferent
<u>Reasons for Stakeholder Position:</u>	
6. FORECASTING - TRANSPARENCY	
The AESO considers that system or aggregate wind forecasts should be transparent and made available to all market participants, particularly near term to real time.	<input type="checkbox"/> Support <input type="checkbox"/> Oppose <input checked="" type="checkbox"/> Indifferent
<u>Reasons for Stakeholder Position:</u>	
7. WIND POWER MANAGEMENT – Curtailment Protocol	
The AESO seeks stakeholder feedback on the work group recommendations to use a Potential MW Protocol and specifically would like input from stakeholders regarding practicality and risks associated with this option.	<input type="checkbox"/> Support <input type="checkbox"/> Oppose <input checked="" type="checkbox"/> Indifferent
<ol style="list-style-type: none"> 1. Pro rata allocation of the system wide wind curtailment among Wind Power Facilities (WPF) 2. Use of Potential MW Capability to allocate for each WPF 3. Curtailments should be re-assess and re-allocate every 20 minutes if the limit for any one WPF has changed by greater than 5MW 	
<u>Reasons for Stakeholder Position:</u>	

8. WIND POWER MANAGEMENT - Supply Surplus	
<p>The AESO solicits input from all stakeholders on the proposed supply surplus protocol and proposed modifications to OPP 103 provided below.</p> <p>(1) Include wind power facilities and co-generation facilities in OPP 103 procedures with co-generation to be subject to Minimum Operating Level (MOL) requirements</p> <p>(2) Establish a Minimum Operating Level (MOL) for each asset and, where possible, assets should not be dispatched below their MOL.</p> <p>(3) Refine MOL definition to include new constraints not included in Minimum Stable Generation¹ (MSG) but that affect the asset's ability to operate at or below a threshold. MOL is a physical operating limit (not an economic limit) for an asset constrained by legal/regulatory, environmental, health and safety, equipment reliability, operating level required to serve dispatched ancillary services, or operating level required to prevent damages to third party equipment. Examples of physical operating constraints for types of generation and import/export are included in the WG paper (Appendix A).</p> <p>(4) Develop a mechanism for pool participants to declare and submit the MOL. It is expected that the need for, approach and frequency of declaration may vary among generators and will need to be defined.</p> <p>(5) Revise the current "inflexible block" definition. The definition of "inflexible block" will need to be amended as follows:</p> <p>"inflexible block" means a block of energy that may be dispatched on or dispatched off, but not partially dispatched on, <u>except for a \$0 offer block it may be dispatched to the asset's MOL.</u></p> <p>Definition of "flexible block" does not require any changes since it accommodates the proposed \$0 SMP management protocol.</p> <p>(6) Provide market indication of supply surplus conditions (similar to supply adequacy situations) to provide market participants an opportunity to take voluntary actions in the face of potential \$0 SMP conditions and also become aware that an out-of-market dispatch to clear the energy imbalance could be forthcoming.</p> <p><u>Reasons for Stakeholder Position:</u></p> <p>Making a statement that "Cogen" should be subject to this curtailment plan is too broad a statement. Not all Cogen is alike. At oilsands sites, Cogen is installed primarily to produce heat in the form of steam. This steam is used to produce oil and any curtailment of Cogen is a reduction of oil output. There is no alternate source of heat/steam that can be switched on to replace lost output when Cogen is curtailed. Also the processes used to produce oil depend on the reliable supply of heat/steam from the</p>	<p><input type="checkbox"/> Support <input checked="" type="checkbox"/> Oppose <input type="checkbox"/> Indifferent</p>

¹ ISO Rule definition for MSG is "minimum stable generation" which means the minimum generation level that an asset can be continuously operated at without becoming unstable.

Cogen. Unpredictable and unscheduled reductions in heat/steam from the Cogen can cause reservoir and facility damage. As heat/steam production is part of a continuous process, the interruption of the supply of heat/steam interrupts the entire production process. Recovery from such an interruption is not immediate when full heat/steam production is restored. In some cases it can take a week or more to restore full oil production. Therefore reducing heat output in order to reduce power output is simply not an option. A main component of the proposed protocol is that “inflexible \$0 offer blocks, flexible \$0 offer blocks and wind power facilities would share the burden of curtailments in a fair and effective manner”. This element of the proposed protocol represents a major policy shift from the existing protocol contained in OPP 103, in that OPP 103 currently exempts “generating units primarily serving load or steam process, including those supplying to industrial systems with industrial system designation” (the “Exemption”) from being directed to minimum stable generation in the event of a surplus of supply. The unique characteristics and economics of non-dispatchable cogeneration facilities, being those whose bids into the system are not price sensitive, dictate that such an exemption should be preserved. Our minimum stable “heat” generation is base load.

At our Primrose site, the primary purposes of our cogeneration facility is to produce steam which is then injected into the ground in order to extract bitumen (InSitu oilsands; as is acknowledged in paragraph 3 of Appendix B to the *Supply Surplus (\$0 SMP) Protocol Work Group Recommendation*) The efficient design of our cogeneration facilities results in the creation of significant quantities of power as a by-product of the steam generation. It also results in a significant CO2 reduction compared to alternatives. Because the primary purpose of our facilities is the creation of steam for bitumen extraction and synthetic oil production, steam reliability is of essential to our operations. Any curtailment in steam production for a cogeneration facility would place a disproportionate burden, both in financial and operational terms, on the primary business that the cogeneration facility was built to support, as compared to a facility whose primary purpose is electricity generation. As the injection of steam into the bitumen reservoir must occur on a continuous basis, any unscheduled interruption in the supply of steam from the Cogen, can result in permanent damage to the reservoir, resulting in the permanent loss of production capacity from the reservoir. The financial burden would manifest in a significant loss of revenue from a reduction in bitumen and oil sales. The value of the heat can be up to 10 times the value of electricity. As such, our cogeneration facilities must run at full capacity continuously and steam production should not be compromised due to power market conditions, including conditions of oversupply.

At our Horizon Project site, the cogeneration facility supplies heat to the bitumen refining and extraction process. Unscheduled interruption in the supply of this heat will immediately impair the production of bitumen and synthetic crude oil from this project. This will manifest itself in financial terms as reduced revenue from the sale of synthetic crude and additional operating costs incurred to restart the process when full steam production returns.

The integrated nature of a cogeneration facility is such that steam and power cannot be made separately which further supports an argument in favor of a continued exemption for cogeneration facilities from any curtailment protocol and was, presumably, a critical factor in the initial decision to include the Exemption in OPP 103. The *Supply Surplus (\$0 SMP) Protocol Work Group Recommendation*, in paragraph 3 of Appendix B, makes the following statement:

“Co-gens are usually sized for the steam requirement and there may not be a lot of flexibility in generation output and (sic) would not cause negative impact to host process. There may be some alternative means to reduce the need for generation output to produce steam such as duct firing.”

Unfortunately, the opinion in the last sentence is incorrect. Non-dispatchable cogeneration steam generation is entirely dependant on maintaining the power output. The suggestion that duct firing could be used to provide dispatchability misses the fact that duct firing has already been maximized to support the steam load. Duct firing is always needed for oilsands steam production in order to get the efficiency of the cogen process to an economically viable level. Duct firing is necessary in order to supplement the available heat provided by the Cogen turbine when the turbine operating at base load. Duct firing is not designed to replace heat which the turbine cannot provide when the turbine is operating at a reduced load. Our Cogen plants and those of our competitors are not designed to produce sufficient heat/steam for the oil production process in the absence of base load operation of the turbine.

A further important consideration that cannot be ignored is that the construction of a cogeneration facility requires substantial investment and a favorable and stable regulatory environment is an important consideration for any entity(ies) considering, or who have already committed to, such a project. The growth in cogeneration in Alberta over the last several years has been substantial, due in part to a favorable regulatory environment. Cogeneration is now an integral part of the infrastructure of Alberta's core industries, providing reliable, on-site steam generation to many sectors including forestry, petro-chemical and oilsands production and refining. In order to encourage the continued development of such projects, investors will require certainty as to the ability of such a facility to operate consistently and reliably. The following illustrates this point²:

“Regulatory barriers pertain to the regulatory environment governing the installation and operation of cogeneration facilities. A key regulatory barrier is access to the electricity grid for the sale of excess electricity. Currently, only Alberta has open access to its electricity grid and has provided easier access to the market. As a result, since 2000, over 1.2 GWe of cogeneration capacity has been installed in the province, more than any other region. While there are many other conditions that affect the penetration of cogeneration (primarily higher electricity prices and reliability issues in Alberta), improved access to the grid and to the market in general are considered primary motivations for the growth of cogeneration in the province.”

Although the paper this quote came from is somewhat dated, the principles that it sets forth remain valid under the existing OPP 103.

In summary, access to the electricity grid for the sale of excess electricity is a key driver of cogeneration development in respect of integrated industrial processes, as this facilitates the ability of the Cogen operator to run the Cogen plant at the output required to facilitate the demand for heat by the industrial process. The proposed protocol represents a significant policy shift which would have a disproportionately negative impact on existing or developing cogeneration projects and would negatively influence the construction of new cogeneration projects in the province. Therefore, Canadian Natural Resources Ltd respectfully requests that the exemption contained in the existing OPP 103 excluding “generating units primarily serving on-site load or steam process, including those supplying to industrial systems with industrial system designation” from the curtailment process should be respected and maintained in any new protocol which may amend or supersede the existing OPP 103.

¹ “*Cogeneration Potential in Canada, Phase 2*” completed for Natural Resources Canada and prepared by Catherine Strickland and John Nyboer of MK Jaccard and Associated in April 2002.



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9. SUPPLY SURPLUS – protocol

The Supply Surplus work group also developed the following protocol respecting OPP 103:

- Support
 Oppose
 Indifferent

Step 1: Curtail opportunity services including import transactions.

Step 2: Take the following actions, taking into account the transmission system operating and reliability constraints and an objective of rotating the curtailments amongst market participants where possible:

- a. Curtail flexible \$0 blocks, by pro-rata assignment,
- b. Where wind generation is required to be curtailed pursuant to (a), assign the curtailment amongst each individual wind power facility using the wind power management protocol,
- c. Curtail inflexible \$0 blocks to the asset's MOL.

Step 3: Curtail an asset to 0 MW (go off line), considering the asset's minimum off time.

Reasons for Stakeholder Position:

See comments under Section 8. above

10. Technical Requirements and Standards

Given the expected difficulty and expense in modifying and/or retrofitting some existing wind power facilities, the WPFTR (s 1.2 g) provided an exemption from the 2004 requirements for any facilities that interconnected under the technical requirements that were in effect prior to November 15, 2004 but specified that these facilities would be required to comply with the WPFTR if the facilities underwent a refurbishment or major upgrade.

- Support
 Oppose
 Indifferent

The AESO considers that this approach is reasonable and prudent but expects that the issue of applicability should be discussed in the rules and standards development and consultation phase. This will include a discussion of the potential grandfathering of certain wind facilities based on the terms and conditions of interconnection agreements and other relevant information.

Reasons for Stakeholder Position:



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11. ADDITIONAL COMMENTS

We are concerned with the lack of engagement of all stakeholders to date. The proposed changes to the curtailment protocol that have been embedded, almost by sleight-of-hand in the *Implementation of Market & Operational Framework for Wind Integration*, have a significant impact on cogenerators in the Province. We urge the AESO to extend the period for stakeholder commentary and to actively notify all stakeholders that are affected by the policy such that they may become appropriately engaged in the discussion.

Please return this form with your comments by April 17, 2009 to:

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