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To: **IESO Stakeholder Engagement**

From: **Brandy Giannetta - Regional Director, Ontario**

RE: **Follow up from February 16th Non-Emitting Resource Sub-Committee Meeting and Webinar on the NERs RFI**

This memo is in follow up to the February 16th NER-SC meeting. CanWEA was not able to participate in person on February 16 but several CanWEA members were in attendance and participated fully in the activities aimed at identifying barriers to participation and brainstormed on potential solutions to address them. CanWEA members were encouraged to participate in person and were provided with the notes below to support the participation.

The information prepared here was meant to support CanWEA members in participation on behalf of the wind energy industry during the breakout sessions as outlined in the NERSC materials and agenda. It should be considered in addition to new information that was documented as part of the workshop. There is also additional information below that is meant to respond to the draft RFI that was presented via Webinar.

1. What do you see as the potential for your resource type in terms of meeting Ontario's electricity needs i.e., MW and location in the Ontario system?

- Declining costs resulting in being amongst lowest cost source of supply
- Can provide baseload supply during period of nuclear generation refurbishments especially post-retirement of the Pickering nuclear generation station
- Coupled with other resources (e.g., hydroelectric generation, energy storage, demand-response, etc.) can provide quick-response energy production
- Significant untapped potential for future development (especially offshore if regulatory barriers can be addressed)

2. What value streams/services can your resource type provide?

- **At the bulk level**
- **At the distribution level**
- **At the consumer level?**

Wind Energy can provide the following:

- Energy
- Some capacity (increased capacity if bundled with other resources like hydroelectric generation, storage, etc.
- Environmental Attributes (EAs) (e.g., Renewable Energy Certificates (RECs))
- Essential reliability services:
  - Inertia/Fast Frequency Response (Quebec, Ontario)
  - Wind can provide synthetic inertia (does not require pre-curtailment)

- Primary Frequency Response (ERCOT, Quebec, Ontario)
- Pre-curtailed wind can provide PFR (down response does not require pre-curtailment)
- Secondary/Regulation/AGC (Xcel)
- Pre-curtailed wind can provide regulation (down regulation does not require pre-curtailment)
- 15-min reserves (Germany)
- Distributed wind is aggregated and bid in to the energy and 15 min reserve market (down regulation does not require pre-curtailment)
- Ride-through (NERC PRC-024)
- Wind can ride-through voltage and frequency events
- Voltage support (NERC VAR-001 and VAR-002)
- Wind can provide or absorb reactive power when it is not windy

- **3. Are there value streams/products to which your resource can contribute that you are not currently capturing?**
  - **In the current market**
  - **In the future market as contemplated through Market Renewal?**
- Most of the above noted essential reliability services as well as value for Environmental Attributes.

  Additionally, it should be noted that reliability services from wind differ from conventional generators in the following ways:

  - May need pre-curtailment (to provide headroom)
  - Faster response
  - Little/no wear-and-tear
  - Accurate ability to follow signal
  - Superior ride-through of disturbances
  - Can provide or absorb reactive power when it's not sunny or not windy
  - Does not contribute to grid strength (short circuit strength)

- **4. For such value streams/products, what is preventing you from capitalizing on the value you create?**
  - **(e.g., technology, wholesale market structure, regulatory, contractual, other)**

Part of the barrier is lack of information. Utilities and regulators are often unaware of the additional non-energy services that wind can provide. Because of that, they think that conventional generators are the only sources of those services. That means they don't set up requirements for advanced functionality. Or perhaps they don't set up markets for those services or don't change rules to allow wind to play in those markets.

Part of the barrier is also the wind industry's focus on energy. As wind penetrations increase, and wind is increasingly curtailed, this focus will shift away from energy and towards non-energy services such as reserves. These revenue streams will become increasing valuable. If the policy and regulatory frameworks allow for wind to provide these non-energy services, wind will shift towards providing them.

Even though wind can provide these essential reliability services:

1) owners have to pay for advanced features – the rule of thumb is about 1% of project cost for the package of advanced features, and

2) If you want an up-reserve, then you have to pre-curtail the wind

The synthetic inertia is the big exception here. We extract kinetic energy from the rotor to momentarily increase power output. That does not require pre-curtailment, but it is a short-lived response, on the order of seconds, and it can reduce power output immediately after providing the response.

Example: ERCOT required retrofitting of existing wind plants to provide primary frequency response. The wind ALWAYS provides a down response, so it curtails a little if frequency is high. It only provides up-response if it is curtailed for other reasons, like an oversupply situation. It's a requirement and they don't compensate for it and they didn't compensate developers for the retrofit.

5. What changes to the current market structure, or existing products would enable you to more fully capture the value your resource creates?

- Creation of new AS products (see list of essential reliability services in #2)
- Amendments to IESO Market Rules in accordance with above points to enable definition of some resources, broader provision of supply of some products (e.g., AS, etc.)
- Clarity regarding potential to 'unlock' EAs under contracts with IESO
- Creation of a specific market from EAs, whether administered through IAM or not (e.g., third party exchange)
- Review of statutory framework (e.g., legislation, regulations, Ontario Energy Board (OEB) Codes (e.g., Distribution System Code (DSC), Retail Settlement Code (RSC), etc.) to determine barriers that should be addressed

NOTE: A discussion is needed regarding whether new 'market' revenues alone will be sufficient to enable investment in NERs (i.e., maintenance, upgrades/expansions, new builds). That is, just because MRP may result in broader access to the provision of existing products and/or creation new products all with 'value' and associated revenues, are there other barriers prohibiting such investments (e.g., regulatory risk, lack of market hedges (e.g., illiquid bilateral contracting market in Ontario), etc.)? And if so, what mechanisms (in or 'out of' market) should be used to further enable NERs?

6. What changes to the future market structure, or new products as contemplated under Market Renewal would enable you to more fully capture the value your resource creates?

Too early in NERSC consultation to determine specific changes, but two broad areas of potential change need to be explored:

- Definition of electricity products (e.g., capacity, energy, AS, EAs, etc.) that could be supplied by NERs, and where products do not exist today define a plan for its development and implementation
- Ability to achieve revenue adequacy to enable investments (e.g., maintenance of existing resources, upgrades/expansions of existing resources, development of new resources), where mechanisms to achieve revenue adequacy could be 'market' (i.e., through IAM) and/or 'out of market' (e.g., contracts, etc.)

NOTE: recent results of Request for Proposals (RFPs) for NERs (e.g., renewable generation contracts recently announced by the Alberta Electricity System Operator (AESO), proposals received by Xcel Energy for Colorado, etc.) need to be reviewed as to what role long-term contracts (i.e., 20 years) had in potential driving contracted and proposed prices to be record lows (i.e., average contract price for wind generation from AESO's recent RFP was 3.7 cents/kWh ($Cdn), median prices for Xcel Energy's recent RFP resulting in prices ranging from 1.8 cents/kWh to 3.6 cents/kWh ($US) for wind generation, wind plus solar generation, wind generation plus battery storage, solar generation, wind plus solar generation plus battery storage, solar generation plus battery

storage), in other words would these results have been achieved without contracts and made based on ‘market’ mechanisms, and what are the implications of this for NERSC and MRP relative to NERs

Draft RFI WEBINAR PRESENTATION

The IESO presented the draft RFI and introduced a comment period to follow. CanWEA lent support to the Consortium's submission prepared by Power Advisory on our behalf.

Highlights from CanWEA's feedback on the RFI are pasted below for reference.

Scope of NERs RFI

During the December 21, 2017 webinar, the IESO identified the NERs RFI as having the following two main objectives:

- Inform IESO and stakeholders, and support IESO's Market Renewal Program (MRP) scope of work to be delivered by the Market Renewal Working Group's (MRWG's) Non-Emitting Resource Sub-Committee (NERSC); and
- Provide information on maintenance/upgrades of existing NERs and development of new NERs, focusing on technical and commercial aspects regarding participation within Ontario's wholesale electricity market and ability to meet power system needs.

CanWEA continues to support the development and the objectives of the NERs RFI. We contend that the information the IESO will collect in response to the NERs RFI ***should be clearly positioned towards providing key input on how Ontario will meet its future supply and system needs while also specifically helping to meet Ontario's climate change policy objectives.***

The following sections provide constructive comments and recommendations regarding the development and timelines of the NERs RFI, consistent with that which was provided by the Consortium under the signature of Power Advisory. ***Overall, if the NERs RFI is to result in useful technical submissions in order to effectively guide and inform the IESO and stakeholders, the IESO should provide additional power system information regarding Ontario's future needs and be more clear in indicating what information is being sought from RFI respondents and how that information will be evaluated/considered.***

Defining Ontario's System Needs Towards Understanding the Capabilities of NERs Meeting These Needs

In order to set technical context for the NERs RFI, ***the IESO should enhance the two main RFI objectives by relating them to Ontario's future power system needs***. By doing so, this will provide needed context to RFI respondents with additional guidance towards preparation of their submissions.

For example, **the following information should be provided by the IESO in context of the NERs RFI:**

- More accurate identification regarding Ontario's future supply needs in accordance with the IESO's Ontario Planning Outlook (OPO) 2016 and the Ontario Government's Long-Term Energy Plan (LTEP) 2017 – based on the LTEP 2017, it appears that Ontario will require approximately 2,000 MW of capacity by the mid-2020s but this projected capacity requirement has not been explicitly expressed (i.e., projected quantity) either by the IESO or by the Ontario Government within any document;
- Further refinement of Ontario's projected capacity needs should be placed in context with enhancing system flexibility needs that the IESO has been discussing with stakeholders (e.g., need to increase regulation services to +/- 150 to 200 MW, need to increase 30-minute operating reserve (OR) by over 700 MW) – to the extent that the IESO wants to better understand the capabilities of NERs to provide flexible supply, then the IESO should define Ontario's system flexibility needs within the RFI itself; and

- Updated connection availability information organized by transmission zone/area, including available connection availability via circuits, and other useful technical information helping to inform facility upgrades and/or expansion and new project development.

If the IESO and stakeholders are to better understand the capabilities and attributes of NERs and how NERs can help meet Ontario's future supply needs, the IESO should provide additional technical information helping to focus the objectives of the NERs RFI while proving additional guidance to RFI respondents, and not simply 'cast the net out wide' for submissions without providing additional technical guidance and requirements based on Ontario's projected system needs.

Technical Conference

The April 5th NERs technical conference should aim to support the above points which should be considered as potentional scope for discussion at the technical conference. ***CanWEA supports the planned technical conference and recommends that a summary report from the technical conference be provided to the MRWG immediately following the conference.*** This summary report should include commentary on the development of the NERs RFI by linking technical capabilities to NERs and how NERs can help to meet Ontario's power system needs.

TIMING:
Coordinating Scope of NERSC and NERs RFI

The IESO has stated that the NERs RFI will support the work of the NERSC. However, it is unclear what exactly the role of the NERSC will be relative to the development of the NERs RFI

If the NER-SC is intended to be the IESO stakeholder engagement initiative to consult on the development of the NERs RFI supplemented by a few IESO webinars (or similar) that will include any stakeholders, then the timelines related to NER-SC reporting to MRWG need to be aligned. This recommendation is supported by the NERSC being a sub-committee of the MRWG, where the MRWG is in best position to opine on matters relating to the NERSC and the NERs RFI relative to MRP. Therefore, the NERs RFI should be a standing agenda item for all NERSC and MRWG meetings.

Further, it is imperative that any recommendations contained in reports developed by the NERSC factor in results of the NERs RFI and its submissions.

While this point supported the recommendations to collapse the proposed two-phase approach with submissions in response to the RFI sent to the IESO by mid-September 2018 and the NERSC report concluding the RFI to be sent to the MRWG in October 2018, this timeline has not yet been accepted or implemented by the IESO.

The current timing to conclude the NERs RFI with submissions sent to the IESO by mid-September 2018 and the NERSC report sent to the MRWG by October 2018 will better line up with the NERSC work[1] and the finalization of MRP high-level design documents (i.e., high-level design documents for the energy and capacity workstreams)[2]. This revised timeline will better ensure that all relevant findings from the conclusion of the NERs RFI can inform the work of the NERSC and the MRP high-level design process. The proposed IESO timelines will

[1] relating to Incentive Mechanisms phase (scheduled for Q3/18) (i.e., Phase 3 of the NERSC scope of work)

[2] which appear to now be scheduled for completion by the end of 2018

not capture important information from the Phase 2 submissions (e.g., development information, indicative cost information, etc.) within present NERSC and MRP timelines.

Additionally, if the IESO is to scope the RFI into one phase, it is paramount that clarity around the future supply needs and subsequent timing of those needs is defined prior to launching the RFI.

Within the stakeholder consultation process to develop the NERs RFI, results, conclusions, and potential post-RFI steps need to be discussed. Within the consultation, information relating to respondents' submissions needs to be discussed regarding what information can be made public and what information remains confidential. For example, information regarding indicative cost, development, and detailed connection and deliverability information will need to be reviewed for proprietor confidentiality.

Conclusions and Proposed Next Steps

CanWEA supports the NERs RFI and applauds the IESO for undertaking this initiative. The information gathered through this initiative will enable the IESO to make informed decisions towards helping to meet Ontario's future supply and system needs. The IESO should be commended for developing a NERs RFI, especially considering recent results from NERs procurement initiatives in Alberta and Colorado.

To enhance the scope of the NERs RFI towards better ensuring thoughtful and technically insightful submissions, CanWEA recommends that the IESO make the following key changes:

- Additional clarity and guidance is required regarding the purpose and objectives of NERs RFI, including sufficient technical information relating to Ontario's future power system needs (e.g., capacity, system flexibility, etc.) and connection availability and the timing of such needs;
- A summary report from the planned March 2018 technical conference should be provided to the MRWG immediately following the conference, including commentary on development of the NERs RFI by linking the technical capabilities of NERs and how they can help meet Ontario's power system needs;
- Collapse the two-phase approach into a single phase with final submissions sent to the IESO by September 2018 and the NERSC report sent to the MRWG by October 2018 regarding findings from the NERs RFI and its submissions;
- Additional clarity is needed regarding how results from NERs RFI could inform MRP high-level design, including how decisions will be made towards determining how information from the NERs RFI submissions and any recommendations from the NERSC could inform MRP high-level design; and
- In addition to informing MRP high-level design, the results of the NERs RFI should also have potential to trigger a formal procurement initiative for electricity supply from NERs (e.g., RFP, etc.).