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Delivered by E-mail

Nicole Godbout
Regulatory Counsel
Nova Scotia Power Inc.
1223 Lower Water Street
PO Box 910
Halifax NS B3J 2W5

Dear Ms. Godbout:

Re: NSPI Draft Variable Generation Integration Costs Assumptions
Integrated Resource Plan (IRP) 2014 – M05522/P-884.14

These comments are submitted regarding the above draft Integration Costs Assumptions circulated on May 1st. We note that we await responses to our questions on the wind capacity assumptions and look forward to receipt of those.

The graphs on pages 4 and 11 show operational wind integration costs versus installed wind capacity with the costs expressed in dollars/MWh. The graph shows a sharp increase in the average cost as wind capacity increases. If $14/MWh is the average cost at 550 MW and $28/MWh is the average cost at 650 MW, please confirm that the incremental cost of integration to go from 550 MW to 650 MW is $105/MWh, (derived as follows):

1. We assume that the $/MWh cost shown in the graph on page 4 is the average cost for the level of installed wind generation (not the incremental cost at each level of installed wind generation).

2. The total wind integration costs with 550 MW of installed wind generation appear to be about $24 million per year [550 MW x 8760 hours/year x 35% CF[1] x $14/MWh (from graph) = $23.6 million/year].

3. Total wind integration costs with 650 MW of installed wind generation appear to be about $56 million per year [650 MW x 8760 hours/year x 35% CF x $28/MWh (from graph) = $55.8 million/year].

4. The difference in total wind integration costs between 550 MW and 650 MW is therefore $105/MWh [($55.8 million - $23.6 million]/((650 MW – 550 MW) x 8760 hours/year x 35% CF) = $105/MWh].

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[1] The 35% capacity factor is an average for NSPI owned wind (and also for total renewable) as per the Maritime Link Application, Appendix 6.02, p.9 of 42, Table 2.1.

If this calculation and interpretation of the graph is incorrect, please explain. Alternatively, if the cost of accommodating additional wind above 550 MW is this high (higher than the cost of wind generation itself), why would it be considered as a resource in the IRP?

With respect to the study methodology – operational dispatch costs (page 8) the Industrial Group suggests that estimates or calculations of the incremental emissions associated with heat rate degradation and additional unit starts resulting from variable generation would be useful in assessing the actual (net) emissions reductions associated with mandatory RES or other policies and should be included.

At p.12 NSPI indicates "GE Energy estimates that NSPI will have to carry additional 32 MW of non-synchronous 10-minute reserve ...". Is this value reported in the Renewable Energy Integration Strategy? If so, where? If not and it was derived, please explain the derivation.

Please provide the back-up data and documentation on how the numbers in the tables on pages 4 and 11 were calculated.

There is little in the document to indicate what NSPI is doing to control operational dispatch costs and additional reserve requirements. In other areas where wind is being aggressively integrated, eg. ERCOT (Texas) and Alberta, wind is being made dispatchable (contracts limit this to about 10% of total hours per year in order to still make the wind project financeable.) Under existing 100% take-or-pay contracts, it would seem to make sense in light of the "incremental operating integration costs" to sometimes simply pay the wind farm operator. The Industrial Group suggests that appropriate consideration be given to this option in evaluating the plans.

Going forward, the Industrial Group submits there should be a requirement for all additional wind farms that they be dispatchable and provide certain system services such as reactive power.

In addition, with respect to new wind technology, the Industrial Group queries if the low production from wind during peak times as NSPI discussed in its Wind Capacity Value Assumptions, is due to the wind turbine blades being iced. It is understood that the existing farms have no de-icing capability, but new turbines do.

It is further noted that wind in Ontario and Quebec carries approximately 30% capacity values. The lower values indicated by NSPI appear to be elsewhere in North America where the system peaks in summer – a low production period for wind. We are different in Nova Scotia as our system peaks when wind production is highest, suggesting a higher value more comparable to Ontario and Quebec.

At page 16, NSPI expresses concern that such technical features for wind turbines are "not available from all wind generation suppliers". The advice we have received is that if one goes out for a tender for wind today, one would normally include many of these technical requirements. The cost of wind turbines over the past five years has fallen significantly and the additional system integration features listed by NSPI have offset some of the cost decline for the "plain vanilla" wind turbines. The Industrial Group recommends that these alternatives be modelled.

With respect to the 10-minute reserve additions discussed on p.12, the Industrial Group presumes that NSPI would tender for this before it incurs the high capital costs of building its own new generation and that alternatives to be considered in such a tender would include facilities on interconnected systems such as in New Brunswick.

Thank you for considering these points.

Yours truly,

Nancy G. Rubin

NGR/lmc

cc IRP Participants