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Ms. Doreen Friis
Regulatory Affairs Officer/Clerk of the Board
Nova Scotia Utility and Review Board
3rd Floor, 1601 Lower Water Street
PO Box 1692, Unit "M"
Halifax, NS, B3J 3S3

14th March 2014

RE: NSPI 2014 Integrated Resource Plan

Dear Ms. Friis,

We welcome the opportunity to comment on Nova Scotia Power's draft assumptions for the IRP as presented to interested parties on Friday the 7th March. We have only been given one week to prepare a response, which in the context of such an important process to our industry, does not represent sufficient time to prepare a more fulsome analysis of the presented information.

To frame our response we believe it is important to set the global context in which we are living.

- In 2012, the World Bank published in their report 'Turning down the Heat' in which they outlined some of the catastrophic consequences of failing to tackle climate change will have on the developing world.
- Last year, the Intergovernmental Panel on Climate Change published in September 2013 the latest updated entitled 'Climate Change – the Physical Science Basis'. This report states with 95 percent confidence that humans are the main cause of the current global warming and goes on to set out some quite frightening prospects in a 'business as usual scenario'.
- In a Canadian context the National Round Table on the Environment and the Economy have published a series of climate change reports, including 'Paying the Price: The Economic Impacts for Climate Change in Canada' which sets out that climate change costs for Canada could escalate from roughly \$5 billion per year in 2020 — less than 10 years away — and to between \$21 billion and \$43 billion per year by the 2050s.

Governments around the world are taking these developments very seriously. The German government legislated for its 'Energiewende' policy (energy transformation) in 2011 an 85% reduction in GHG emissions by 2050. In a similar vein the British Government legislated by way of its Climate Change Act an 80% reduction in GHG emissions by 2050. The Federal Government's only response to date has been by way of the regulations for coal-fired electricity generators that are due to come into force in 2015. However, it is clear, given the latest science and the leadership being taken by various governments around the world that over the next decade there will be considerable pressure on Canada to follow suit and legislate for much more ambitious GHG reduction targets.

It is in this context that we now turn to the draft assumptions in the IRP. In our opinion, the IRP is a key instrument to inform government policy about the development of the electricity system here in Nova Scotia but equally as important the opportunity to inform government about the consequences of the



dramatic changes that are likely to occur in the way we generate and use electricity over the next twenty years. It is well recognized that the electricity sector presents some of the ‘low-hanging fruit’ when it comes to offsetting GHG emissions and in this context we contend that the draft assumptions fall short in terms of the projected GHG reduction targets and increased renewable energy deployment. Given the short timeframe for responses we are not in a position to set out alternative assumptions but rather we focus on proposing why further thought and discussion is merited:

1. Environmental/Emissions Constraints

- The stated GHG emission targets for the period between 2015 & 2035 have been drafted on the basis of the existing Federal legislation. With global developments as described above we believe that more discussion and thought is required as to what the appropriate GHG ‘book-end’ cases would look like. A suggestion would be to look at the British and German 2050 targets and perhaps applying standards similar to these to Nova Scotia as a ‘book-end’.
- NSPI’s Case A and B show what a base case (current government standards) is and a lower standard (less reduction) of reducing GHGs, NOX, SOX and Hg. We believe it would be important to also show an increased standard (more reduction) than what the current government policies mandate.
- There is no increase in mandated renewable energy penetration proposed beyond 2020. Given the global context we do not believe that this adequately represents a likely scenario and believe that two ‘book-end’ scenarios are merited and require more discussion. While NSPI believes that this is taken care of by the differing levels of environmental standards, it would be of interest to us to see what an increased renewable energy standard would cost or save.
- In many jurisdictions carrying out resource planning, it is now common to include scenarios which seek to understand what the cost to the rate payer would be with varying costs allocated to carbon and other GHG emissions. Perhaps allocating a payment for non compliance in terms of GHG emissions or a saving by selling over compliance to another jurisdiction.

2. Wind Capacity Factor & Integration Cost

- The new studies that are being completed by NSPI should not be included in the IRP until they have been reviewed by the many stakeholders in wind energy in the Province. While all people realize there is a cost to Wind integration as there is with any form of energy, it is important the IRP is not biased by studies that still have not been review appropriately.
- The GE Wind integration study identified many areas of further study that were required in order to understand the operational impacts of higher levels of wind penetration. The impact of a more stringent grid code requiring wind facilities to provide frequency response, curtailment, ramp rate restrictions and other performance enhancements would dramatically increase the ability to integrate larger quantities of wind. As stated above, without understanding how these would affect the system, it is important to not be too conservative on the approach to renewable energy and specifically wind.
- The capacity value of wind is difficult to quantify. As the study by NSPI has not come out, it is premature to include that information in the IRP without first reviewing it with stakeholders.

3. Load Forecast

- In terms of load growth, the possibility of the LNG plant should be viewed in this study. This would represent a step up in load growth which should be considered for electricity demand.



- Sensitivity on load growth due to electric cars would be of interest to see.

4. Future Supply Options

- In the draft assumptions, the cost/MW for the various technologies is stated but there is no comment on the cost per MWh.
- The assumption that integration costs should be added to wind energy is premature and is not something that can be added as a step factor. Once again this is difficult to comment on as no numbers have been given.
- It is noted that only pumped hydro storage has been considered for the assumed storage options. There are a variety of battery storage options on the market now which should also be considered.

5. Hydro Generation

- The costs associated with incremental capacity increased in hydro should be the total cost of the refurbishment not just the difference between maintenance and total capital cost, unless the maintenance is due that year. In other words if the maintenance is not due until 2030 and it is only 2020, the maintenance cost should not be removed. If however it is the same year, then it seems acceptable to delete off the maintenance cost.

6. Fuels Forecast

- The fuel cost assumptions should take into account the possibility of gas storage in the Province. There should be a scenario where we can avoid the winter spikes as we will have storage in the area to fill up during the summer months and withdraw in the winter months. Heritage Gas is already considering such an investment.

7. Financials

- The cost of capital stated by NSPI should not be a single number; there should be a sensitivity to see what could be possible if the cost of capital for NSPI was 100 basis points lower.

Natural Forces is happy to comment on this process, but once again must state that the short timeframe given to stakeholders to comment makes it difficult to comment on all portions of the IRP assumptions. Thank you for inviting us to work on the IRP process and we look forward to continuing to work on this study.

Yours Truly,

A handwritten signature in black ink, appearing to read "John D. Brereton".

John Brereton
President, Natural Forces Wind Inc.