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BCTC
Long-Term Transmission Inquiry Team

August 10, 2009

**Re: Response to “BC Transmission Corporation – Scenario Workshop”
presentation. Vancouver, August 5, 2009.**

Attention: Paul Choudhury and Kip Morison

This submission is on behalf of OREG’s members. OREG is Canada’s renewable wave, tidal and in-stream energy development association. OREG members include technology developers, power project developers, utilities, Provincial and Federal government departments, and marine sector members. The association is heavily engaged with the international developments in this emerging energy sector, and many of the leading international technology developers are active members.

OREG is regularly asked to lead discussions at international events on promoting the enabling pathway to accelerate the renewable resource diversification and the new industrial opportunity that these three resources can offer. OREG’s input has been significant in the shape of the tidal development initiatives now underway in Nova Scotia. We hope to contribute significantly to the exploration of the BC resource opportunities as the Inquiry looks into the next 30 years, as there is an emerging worldwide conviction that competitive renewable wave, tidal and in-stream energy will be widely adopted well within this timeframe. The implications of the geography of that adoption in BC (largely Vancouver Island and Haida Gwaii) can clearly change the importance of these regions in any long-term planning, and might even support discussion of grid vs. point-to-point planning concepts.

I would like to commend you on taking the workshop initiative and presenting early thoughts as a method to get intervenors to think through how long-term plans (scenarios) will be developed for BCUC’s consideration. Clearly the scenario and sensitivity evaluation you have proposed will provide some basis for the Commission when considering the challenge of forecasting forward 30 years – in 1980 the idea that landlines would be superfluous to many users of the then unknown, now ubiquitous, mobile phone would have been dismissed as ludicrous! In your choice of scenarios (and

the market scenarios to be analysed by E3), this forecasting challenge will clearly have to be addressed. However the initial E3 scenarios may deserve a second look. They may have served the purpose of the August 5th presentation, and as a background in submission to BCUC, outlining the seven scenarios, representing a generic range, from which you will refine before your September filing.

My notes on these seven initial scenarios are as follows:

- There is an extremely low probability that a “Current Practice” scenario will be realised. As one example of increased electricity requirements in BC alone: the imminent opening of the Canada Line, recent commitments to the Evergreen Line and last year’s \$14 billion Transit Plan¹ are existing commitments that will shift transportation energy requirements to electricity. I recommend that this scenario be dropped from active consideration.
- The likelihood that a “Low economic growth” scenario will result in *less-of-the-same* is also improbable. During the last 12 months of economic turmoil there have been consistent messages from leaders, such as the UK’s Brown and the US’s Obama, that the economy that will emerge will be a *post-industrial revolution* low-carbon economy. The Canada-US Energy Dialogue², passage of the US Clean Energy and Security Act, the engagement of BC and its neighbours in the Western Climate Initiative, and existing and proposed renewable portfolio standards all point to a transformation in electricity markets. This will increase the demand for clean electricity, even if growth in total demand stops or declines. I suggest that this scenario is already captured in the “Moderate GHG reduction” scenario.
- I urge you to consider how likely the “Non-Wire” scenario could be. Even with a focus on BC demand alone, is it likely that load in the urban centres (likely the focus for electrification) can be met through DSM, behind the meter generation, or within-zone generation? When the western-region market is considered, surely this becomes even more unlikely. I suggest that this scenario can be set aside.
- I do not see resource diversity showing in any of the proposed scenarios as a market driver. In many jurisdictions, security and reliability are emerging as drivers for transmission and resource development. For example, the New Brunswick System Operator is evaluating the concept of creating premium values for tidal integration into their system. A recent study for British Wind Energy Association³ concluded that: “...diversifying the renewable energy mix by including a greater proportion of wave and tidal stream energy would reduce requirements for back-up and reserve capacity, lower carbon emissions and save fuel. This could lead to cost savings of as much as 3.3% of the annual wholesale cost of electricity due to the increased mix diversity.” We believe that growing demand for renewables will be accompanied by a growing avoidance of reliance on a narrow resource mix. We would expect this as a reliability requirement,

¹ http://www.th.gov.bc.ca/Transit_Plan/index.html

² <http://pm.gc.ca/eng/media.asp?id=2433>

³ http://www.bwea.com/pdf/marine/Redpoint_Report.pdf

particularly in regard to mitigation of potential climate change impacts, and as support for a system optimization that exploits rather than *fights* daily, seasonal and annual variability. We would propose that one market scenario address the implications of demand for a secure basket of resources.

- Perhaps the largest, and at the moment least-understood, market driver may be the pricing of carbon emissions. We would suggest that E3 scenarios must include consideration of a range of carbon-pricing evolutions. These can be expected to significantly influence marginal electricity costs, add costs to existing generation, and drive conservation and fuel switching, resulting in significant electricity market impacts.

With regard to E3's Resource scenarios

- It does not seem clear why two nuclear scenarios are of value.
- If the "Non-Wire" scenario is deemed unlikely, the contentious discussion on resource restriction can be avoided.
- With regard to "Renewable Targets", BCTC has heard in the workshop that some see these simply as administrative tools to target GHG goals, but we remain convinced that renewables targets and GHG targets will need to be considered. It seems extremely unlikely that current policies reflect the future particularly well, the implication being that renewable targets will become more aggressive, a situation that already sees them being increased in experienced jurisdictions. We believe that this driver may be more complex and might even have to be subdivided or given more weight as suggested below.
- Expanding on the discussion on the value in renewable resource diversity, we suggest the scenarios consider the difference between drivers focused on increased renewable penetration (e.g. more wind or more RoR) as opposed to a renewables' diversification target (e.g. bringing in gravity-based tidal power or persistent, forecastable wave, etc).⁴
- Further to the discussion relating to carbon-pricing impacts; they can be expected to have significant impacts on draw-in of resource options with higher initial generation and integration costs yet lower risk of long-term price increases. The variance in the anticipated rate of increase in carbon prices may also be a significant driver. On the choice of resource options taken up at any time.

Regarding the transmission modeling approach:

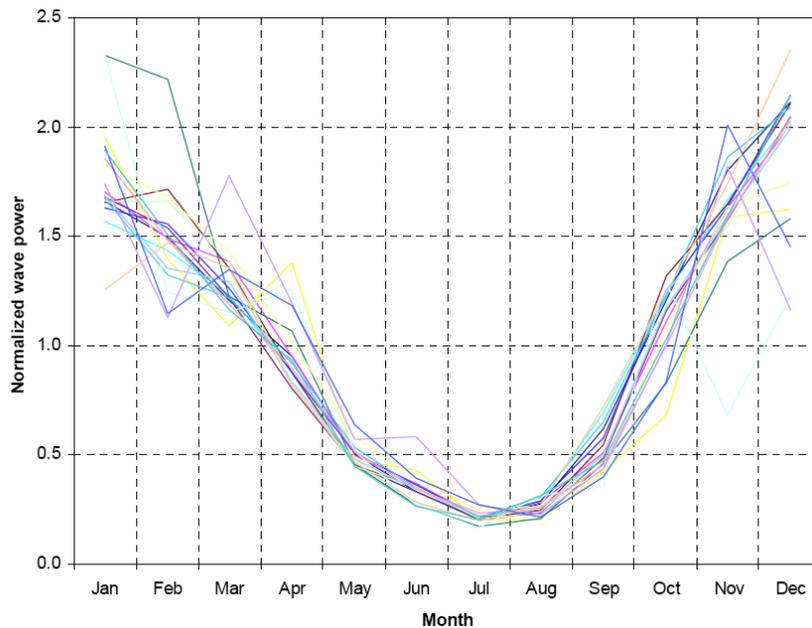
- Modeling is expected to pick resource options based on current generating and transmission costing. It is difficult to see how emerging carbon cost additions or reduced costs due to experience and technology development can be incorporated in these optimizations ("Marine renewable energy has the potential to become competitive with other generation forms in future."⁵). For emerging energy resources harvested with technology that has yet to mature (wave, tidal and in-

⁴ http://www.oreg.ca/docs/Carbon_Trust_Reports/FutureMarineEnergy.pdf
http://www.oreg.ca/docs/Carbon_Trust_Reports/DiversifiedRenewableEnergyResources.pdf

stream etc.), scenarios may need to be tested using cost estimates based on mature technologies. At a minimum, this sensitivity analysis should be done to test whether assumptions on the role of any of the energy zones might be changed.

- Scenarios may need to be forced and sensitivity analyses may be required to test whether assignment of a value to energy characteristics would influence the timing and geography of integrating emerging energy resources. For example, the consideration of inherent values such as predictability and winter peaking (See Figure One⁶). “On average wave power delivers over five times as much energy during periods of peak electricity demand than it does in periods of low demand. Developing around 10% of the UK tidal current resource at a range of sites would result in low daily variability.”⁷ Beyond this, modeling should address the potential added-value inherent in a basket of resources within the likely energy zones.

Figure One: Pacific Coast wave energy by month at various observation stations



In conclusion, at either the market scenario or transmission modeling level, there should be consideration of a “made in BC” approach. This approach would be aimed at using the Province’s domestic clean energy needs to demonstrate and drive the launch of a clean electricity sector as a critical part in the low-carbon economic strategy. Such a strategy would see small amounts of emerging clean energy resources mobilized through *carve-*

⁶ <http://www.oreg.ca/docs/Atlas/CHC-TR-041.pdf>

⁷ http://www.carbontrust.co.uk/NR/rdonlyres/EC293061-611D-4BC8-A75C-9F84138184D3/0/variability_uk_marine_energy_resources.pdf

outs or *feed-in-tariffs* creating demonstrations, cost reduction experience, and the ability to pursue business and economic opportunities in world markets.

This issue is perhaps critically important given the discussion around the LTAP ruling vis a vis the BC Energy Plan 2007 policies. The plan includes:

- ...ensure a secure, environmentally and socially responsible electricity supply
- ...look for opportunities to facilitate First Nations' employment and participation in the electricity sectors to ensure that First Nations people benefit from the continued growth and development of British Columbia's resources
- Transmission is a critical part of the solution as often new clean sources of electricity are located away from where the demand is. In addition, transmission investment is required to support economic growth in the province and must be planned and started in anticipation of future electricity needs given the long lead times required for transmission development
- Review BC Utilities Commissions' role in considering social and environmental costs and benefits. Ensure the procurement of electricity appropriately recognizes the value of aggregated intermittent resources
- Government's goal is to encourage a diverse mix of resources that represent a variety of technologies. Some resource technologies, such as large and small hydro, thermal power, wind and geothermal provide well established, commercially available sources of electricity. Other emerging technologies that are not yet widely used include large ocean wave and tidal power, solar, hydrogen and advanced coal technologies

The reason for emphasising these points is that the energy plan is raising the prospect that BC's electricity requirements be used to drive related economic development and innovation opportunities and suggests that transmission development needs to be planned ahead of, rather than in response (and too late) to demands. Our suggestion is that a scenario be developed in which transmission is considered as the enabler of regional generation and associated economic opportunity (direct and indirect). This scenario would look at transmission development in similar ways that road, rail, electrical distribution and other infrastructure have been considered in development of agriculture, forestry, mining, manufacturing and other industrial and economic strategies. In this model transmission options would be driven by a priority in making economic and generation opportunities accessible. This time it is the renewable electrical energy resources, and the renewable electricity supply and service chain that must be enabled, rather than simply providing electricity to other industrial and economic opportunities.

Thank you for the opportunity to comment. We are ready to work with you in support of these directions at your convenience.

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