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B.C. / Powerex and Renewable Energy Opportunities

British Columbia and the Pacific Northwest regions are poised to become one of the great wind and other renewable energy production centers of the world.

Although wind energy in this area has tremendous potential, it is an intermittent and sporadic resource when concentrated in only one area. The conventional solution to mitigate these characteristics is to compensate for variations in the supply of wind energy by supplementing with other sources of generation which can respond rapidly. Examples of alternatives typically mentioned are natural gas generation and/or energy generated from large hydroelectric storage reservoirs. The United States Bonneville Power Administration ("BPA") is currently using some of its hydroelectric capacity for this purpose. However, the large hydroelectric storage reservoirs of British Columbia already serve a valuable and highly profitable function in the electricity trading world and provide significant revenue to the B.C. Province. Because of this, their capacity to serve dedicated duty for "firming" wind energy is limited.

There is however, a potential cross-boundary and regional solution to this problem. Although wind may be intermittent or sporadic at any given location or region, it is likely to be blowing elsewhere in the adjoining regions. Similarly when the wind is not blowing in one area, it may be matched or offset by run-of-river hydro projects during certain times of year, or by other renewable energy supplies. When joined over a broad geographic region by the extensive BCTC and BPA transmission systems, the energy output would be relatively stable – the small intermittencies "smoothed" out, and sporadic local deficiencies balanced with neighboring abundance.

The three key elements required to capitalize on this phenomenon are:

(1) sufficient transmission capacity to move energy, particularly renewable energy, from multiple generating regions to market centers - as needed and as available;

(2) a trading entity capable of initiating and managing the large volume of transactions that would result from inter-regional trading of intermittent energy;

(3) proceeding ahead with decisions to build renewable energy projects within British Columbia.

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This combination of actions could result in major benefits for Powerex (the unregulated trading subsidiary of BC Hydro) because the skill set of Powerex is ideally suited to the requirements of this new opportunity. Powerex would be able to position itself quickly to become a leader in the regional trading and "balancing" of renewables. This is especially critical given British Columbia's future energy supply needs and intention to move ahead on renewable investments.

British Columbia will soon face the same the challenge currently being faced by Bonneville Power Administration, as it integrates thousands of megawatts of new wind energy. As the Province begins to develop its own vast resources of wind energy, demands could be made on BC Hydro's hydroelectric storage dams to help integrate B.C.'s domestic wind generation. This could impact Powerex's current competitive advantage in its marketing by committing energy storage capacity presently used to generate significant profits for the Province of British Columbia. However, a cross-border "Renewable Energy Exchange" could be the key to the government's ability to move forward on its energy plan, expand Powerex's use of its impressive talent base and experience, and offset some of the costs of achieving a B.C. energy self sufficiency - think of it as "energy self sufficiency plus."

Timely action is critical. Bonneville is presently facing a formidable challenge of integrating more than 2,000 MW of wind energy into its system. Furthermore, BPA expects a total of up to an additional 6,000 MW of wind energy to be added by approximately 2013.[1] Various wind projects within its service area are being brought online quickly. For example, PSE just announced the purchase and further development of the Lower Snake River Wind Energy Project, which could produce up to 1,400 MW alone. BPA must rapidly develop and implement solutions for integrating this amount of wind into its system. In the absence of an initiative by British Columbia and Powerex, BPA will undoubtedly commit to other solutions which do not include British Columbia.

At this time, British Columbia has an edge because it can rapidly mobilize the formidable talents of its trading agent, Powerex. However, creating a Renewable Energy Exchange depends on significantly expanding the cross-border transmission capacity between the grid managed by BC Transmission Corporation and BPA on an expedited basis.

The Juan de Fuca Cable offers a reliable, major first step to address this need. As a fully permitted, environmentally sound project without opposition, the Juan de Fuca Cable can be operational within 24 months from the decision to construct the project. This timeframe matches the amount of time to bring renewable energy projects in B.C. (which are already permitted) on line to be used in part as a balancing resource against renewable resources now built or being built in the Pacific Northwest.

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[1] *See* http://www.bpa.gov/corporate/WindPower/index.cfm

British Columbia has much to gain by adopting the above strategy:

- By leveraging its present talent base, Powerex has the opportunity to become the dominant player in a emerging new regional trading sector for renewable energy. The intermittent aspect of wind and run-of-river hydro energy generation could multiply the number of trading transactions presently occurring, resulting in the opportunity of a sizable new trading sector opening up for Powerex.

- Addressing integration of renewables on a regional basis ("wind firming wind" or "renewables firming renewables") introduces an efficiency which preserves the capacity of British Columbia's large hydroelectric storage dams for enabling large contract trading. Rather than requiring the capacity of the large dams for firming of domestic renewables, allowing the regional wind resources to firm each other leverages the dams' capacity to simply become refining mechanisms for the firming of renewables against each other, which can be done on a transaction by transaction basis.

- By encouraging the construction of renewable resources on a domestic basis, the Province is building diversity and resiliency in a timely way into an energy supply system which is presently reliant on stable precipitation patterns. Those patterns are at risk as a result of the unpredictable nature of climate change.

- The Province can get the initial jobs, investment and revenues from the IPP (*ie* private sector) construction of the new projects.

- As it moves towards a goal of self sufficiency, British Columbia has the opportunity to build in advance of urgent need, and to have its own new renewable resources - which part of the time would contribute towards regional wind balancing, and the rest of the time build domestic energy security - partially paid for by others.