Exports

OVERVIEW

This summary brief provides information on the specific requirements of the Clean Energy Act (CEA) regarding the export of renewable energy from British Columbia over and above any self-sufficiency surpluses that may be available in managing the domestic portfolio, and the work BC Hydro and Powerex are undertaking to address these requirements in the Integrated Resource Plan (IRP).

Self Sufficiency Surplus

The Self-Sufficiency requirements of the CEA obligate BC Hydro to have rights to electricity from resources in B.C. sufficient to meet expected load requirements under critical water conditions[1] by 2016 and to exceed that volume by 3,000 GWh/yr by 2020. As BC Hydro meets these requirements, there will be a surplus of energy in most years. Surplus energy and system capability is traditionally exported by Powerex, a subsidiary of BC Hydro that is responsible for trading power with Alberta and the US, and the revenue generated from the exports is used to reduce domestic customers' rates. As such, BC Hydro / Powerex strive to optimize the value of this surplus.

PURPOSE

To provide information on the specific requirements of the Clean Energy Act regarding exports and the work BC Hydro and Powerex are undertaking to address these requirements in the Integrated Resource Plan.

In meeting the self-sufficiency requirements, BC Hydro is expected to have an energy surplus of about 8,000 GWh/yr under average water conditions. The estimation is based upon 4000 GWh/yr of non firm energy from Heritage Hydro resources, 3,000 GWh/yr from the insurance requirement, 3,000 GWh/yr of non-firm from existing IPPs and future resources, and with generation from all dispatchable natural gas-fired generation being reduced to a minimum. Further, in considering the variability in water inflows to the Heritage Hydro system alone, the average 4,000 GWh/yr of Heritage Hydro non-firm energy can vary between 0 GWh/yr and 10,000 GWh/yr in any given year. Hence, the annual energy surplus can vary from as low as 4,000 GWh/yr to as high as 14,000 GWh/yr. Among other factors, additional variations in IPP generation and generation from future resources will also contribute to these extremities.

The remainder of this paper will discuss exports of renewable energy from B.C. that would be in addition to these self-sufficiency surpluses.

Historical Trade Activities

The BC Hydro bulk transmission network is connected to Alberta and to the western United States, making it possible to trade electricity back and forth across those borders. This interconnectivity helps to bring stability to the whole system, as each provider is able to step in if another experiences a transmission failure or a temporary shortage. It has also enabled B.C. to take advantage of imported electricity when it is inexpensive and to provide net profits to BC Hydro by selling energy when electricity market prices are high. With the flexibility of large reservoirs behind its major dams, BC Hydro can make economic decisions about when to use the water to generate electricity and when to import electricity to generate revenue through this trading process.

[1] Critical water conditions are the minimum amount of energy that the Heritage Hydro system can supply under the most adverse sequence of water inflows in the recorded period.

Trading of electricity is impacted by natural variations in water supply (wet years, average years and dry years) that directly affect the ability of the hydro systems in British Columbia, the Pacific Northwest and Northern California to produce energy, and differences in demand for energy by season across the west (high in British Columbia, Alberta and Pacific Northwest in winter -- high in desert Southwest and California in summer). The supply and demand conditions result in market prices that vary over the years and within the year.

Export Provisions in the Clean Energy Act

The CEA sets out several energy objectives, the following relate directly to BC Hydro's export activities:

- To be a net exporter of electricity from clean or renewable resources with the intention of benefiting all British Columbians and reducing greenhouse gas emissions in regions in which British Columbia trades electricity while protecting the interests of persons who receive or may receive service in British Columbia.

Further, in section 3 (1) (d) and (e), the CEA requires the following to be submitted in the IRP:

- A description of:
  - The expected export demand during a defined period;
  - The potential for B.C. to meet that demand;
  - The actions that BC Hydro has taken to seek suitable opportunities for the export of electricity from clean or renewable resources, and
  - The extent to which the authority has arranged for contracts for the export of electricity and the transmission or other services necessary to facilitate those exports;
- If the authority plans to make an expenditure for export, a specification of the amount of the expenditure and a rationale for making it.

As a result of these CEA provisions, there may be an opportunity for BC Hydro to acquire renewable energy from Independent Power Producers (IPPs) in British Columbia explicitly for exporting to other jurisdictions to help manage the carbon footprint in the broader region. Such exports would make use the existing electric system to integrate, shape and deliver cost effective renewable energy to neighboring jurisdictions for the benefit of British Columbia. This would be done so that the costs associated with these exports would not be borne by domestic electricity customers.

Examination of Export Market Opportunities and Transmission Development

BC Hydro will consider a number of factors when examining export market opportunity for the IRP, including:

- Current and potential federal, provincial, and state energy and environmental policies;
- The estimated size of the renewable electricity market under current policies; how a US federal clean energy standard might impact market size;
- The estimated size of the potential market under carbon legislation;
- The amount of existing renewable generation in place or contracted net of attrition;
- The competitiveness of British Columbia resources and the market share British Columbia resources could expect to capture;
- The transmission infrastructure necessary to optimize the value of provincial generation needed to satisfy self-sufficiency with insurance requirements;

- The transmission infrastructure necessary to enable contracted long-term electricity exports;
- Public, stakeholder and First Nations input on clean generation for export.

The consulting company, Black & Veatch is conducting an analysis of the potential market for British Columbia energy. The results of this analysis will be shared with the IRP Technical Advisory Committee in April 2011.

As a component of the IRP, BC Hydro will undertake a study to assess generation and transmission infrastructure needs in British Columbia to meet various possible export volumes.

The IRP is to be delivered to Government in November 2011. Upon reviewing the IRP, the Government may direct BC Hydro to commence a process of acquiring energy from IPPs in British Columbia with the intent of aggregating this renewable energy and exporting to markets outside British Columbia.