

**Inquiry into British Columbia's Long-Term Transmission Infrastructure
Columbia Power Corporation's Comments
on the
Commission Staff Discussion Draft on Scope of the Inquiry**

I. Introduction

Columbia Power Corporation ("CPC") is pleased to provide comments to the Commission on the Staff Discussion Draft on Scope of the Inquiry. CPC's mandate is to undertake power project investments, as agent of the Province of British Columbia, on a joint venture basis with the Columbia Basin Trust. CPC has three operating hydroelectric generating facilities in the Columbia Basin: Arrow Lakes Generating Station, Brilliant Dam and Brilliant Expansion. Those projects provide a total of 450 MW of clean and renewable generating capacity. The Waneta Expansion project, subject to government approval, will provide an additional 335 MW with construction starting as early as the fall of 2009. In addition, CPC operates the forty-eight kilometer Arrow Lakes to Selkirk Substation Transmission Line. Accordingly, CPC has a vital interest in ensuring that adequate and reliable transmission is available within British Columbia to link the joint venture's existing and future projects with the markets they serve.

The task set before the Inquiry is complex and the Commission's recommendations are likely to significantly influence a range of policy, operational and commercial decisions for several decades. British Columbia is richly endowed with diverse energy resources that can be harnessed for producing electricity. Knowing that transmission infrastructure is or will be in place is essential to provide power generators with the confidence that British Columbia's electricity grid can accommodate and optimize new generation investment. Ensuring adequate and reliable transmission infrastructure and capacity also provides confidence to consumers who need dependable electricity to power their homes, businesses, and industries.

To assist the Commission in integrating intervenor comments into a consolidated scoping document, CPC offers the following comments organized in the same general manner as the Commission Staff Discussion Draft.

II. Assessment of Generation

A. Distributed Generation

Distributed Generation ("DG") systems utilize power generation technologies located near an electrical load. DG contrasts with generation from large facilities that must be transmitted over long distances. DG minimizes transmission and distribution line losses, minimizes transmission congestion, and thereby improves the overall efficiency of the system. With technological advances in photovoltaics, micro wind generation and highly

efficient small combined heat and power plants, and further DG innovation likely to arise within the determination period, CPC believes that DG will play an important role in British Columbia's electricity system. CPC therefore encourages the Commission to consider the impact of DG systems over the thirty-year study period and make recommendations for appropriate development and implementation.

B. Electricity Storage

Historically, generation and transmission facilities have been designed based on the notion that electricity cannot be stored. Supply was required to meet demand on a moment-by-moment basis. However, pumped hydro energy storage now has an estimated installed capacity worldwide of 110,000 MW.¹ Pumped storage can be used as a means of integrating the operation of power production sources and maximizing the efficient use of those resources. Pumped storage may also help in making renewable energy more economically viable. CPC notes that FortisBC's recent resource plan application to the Commission includes pumped hydro storage as part of its preferred resource portfolio.

The current approach for generating, transmitting and delivering electricity in British Columbia was not designed to handle changing loads combined with intermittent, dispersed generation sources. The ability to decouple generation from on-demand consumption is a major potential paradigm shift for the electrical industry. CPC supports the Commission investigating implementation of pumped hydro storage as a way to meet capacity requirements for British Columbia over the next thirty years.

C. Carbon Capture and Storage

Western Canada is well positioned to become a leader in carbon capture and storage ("CCS"). The unique storage potential of the Western Canada Sedimentary Basin along with a significant infusion of funds for research and development of CCS facilities now occurring in Canada and the U.S. could allow for the sequestration of CO₂ from coal-fired generation. Integrated Gasification Combined Cycle, or IGCC, may also be used with CCS technology.

In addition to the coal resource, CCS requires CO₂ transportation systems and the availability of suitable saline aquifer storage reservoirs. CPC respectfully suggests that as part of the Inquiry the Commission should determine the resource capability for the deployment of CCS in British Columbia. Developments in such capability over the determination period could significantly change transmission needs if higher carbon emitting technologies with sequestration became an acceptable supply option for British Columbia within the study period.

¹ Electricity Storage: A multi valued technology opportunity, Natural Resources Canada, 11 November 2008, p. 14.

III. Assessment of Demand

A. Utility Forecasts

CPC supports looking to the utilities' long-term resource plans and contingency resource plans to establish a baseline for the Inquiry. However, CPC believes that technological advances, policy changes, and other significant events will inevitably occur over the determination period, necessitating that those plans evolve and adapt to changing circumstances. To aid the Commission and intervenors to maintain a forward focus throughout the Inquiry, and to help view resource plans in an appropriate context, CPC proposes the discussion and adoption of a set of high-level principles as follows:

1. Energy demand, in all forms, will increase over the thirty-year study period.
2. Energy infrastructure in the Pacific Northwest region tends to run in a north-south alignment. The Inquiry should identify and acknowledge the geographic, historic, political, commercial and other factors that have shaped the development of British Columbia's transmission system. The policies and opportunities unique to our province must be reconciled with the need for reasonable consistency in energy and environmental goals that reflect the reality of the existing and future North American integrated energy market.
3. The current primarily fossil fuel driven nature of electricity and transportation fuel markets in North America will transition to other fuel choices over the thirty-year study period.
4. The convergence of environmental concerns, energy security, and green job creation will continue over the thirty-year study period.
5. Technology will advance in all areas over the determination period, but the timeline for the development and deployment of specific new technologies (proven, probable, possible) is very difficult to predict.
6. Transmission development in British Columbia must appropriately balance energy requirements, environmental impacts, and economic interests.

B. British Columbia Export Policy

Currently, BC Hydro has no mandate to build transmission lines for export beyond meeting the self-sufficiency requirements in Special Directive 10. This business practice contrasts with provinces such as Manitoba, which sources contracts to export electricity into the U.S. and builds facilities within the provincial borders specifically to fulfill those

contracts. At some point during the thirty-year study period will British Columbia export greater volumes of clean and renewable energy to the U.S. Western Systems Coordinating Council region due to a change in provincial export policy? CPC suggests that the Commission should consider the impact of possible changes in British Columbia's electricity export policy over the thirty-year study period.

C. Electric Vehicles

Electric plug-in vehicles ("EPVs") hold the promise of radically changing the world of personal transportation, which is almost exclusively dominated by petroleum. Large CO₂ reductions are possible by switching vehicles from gasoline or diesel to electricity supplied by clean and renewable sources. CPC views electric vehicles as having the potential to penetrate the transportation industry in a meaningful way over the study period. In terms of anticipating future load growth in British Columbia, EPVs are truly a wild card in terms of what future electricity requirements might be.

In addition to CO₂ reductions, another key aspect of the large-scale deployment of EPVs is the opportunity to manage intelligent two-way power flow between the EPV and the grid. Making EPVs "grid-aware" would make it possible to control the charging to meet the freedom-of-use needs of individual drivers and the assist in the efficient operation of the grid by utilizing EPVs' batteries as a source of distributed energy storage. Theoretically, utilities could discharge power from vehicle batteries to the grid to smooth peak periods or to provide firming backup for intermittent resources such as wind. CPC encourages the Commission to consider how broad deployment of EPVs within the study period would affect transmission requirements and operations.

IV. Assessment of Transmission

A. Transmission Corridors

Corridors may be used for routing transmission lines to limit the overall impact of infrastructure development. A defined transmission corridor versus a spider web of transmission lines will reduce the overall impact. The Commission and intervenors will likely benefit by considering the work that has been undertaken by other jurisdictions regarding the design and establishment of transmission corridors. One such example is Bill 19, the *Alberta Land Assembly Project Area Act*, which addresses public infrastructure projects such as transportation and utilities corridors.

Given Alberta's recently announced plans for a \$14.5 billion transmission system upgrade ², and in light of the significant existing and potential interties between the two

² Government of Alberta News Release: <http://alberta.ca/ACN/200906/261149D4CF393-F6A4-BFBD-73258BC6700DF959.html>

provinces' systems, CPC would encourage the Commission to pursue an information exchange between the two jurisdictions to enhance overall coordination, exchange ideas and address common problems. Perhaps that could be achieved by inviting Alberta participants to attend one or more of the Commission's workshops.

B. Transmission Line Technology

Transmission lines can be built using either alternating current (AC) or direct current (DC). High voltage direct current (HVDC) is able to carry large amounts of power. There are operational advantages and disadvantages compared to conventional AC transmission. In some situations HVDC may be the preferred choice, for example where there is a need to have more energy carrying capacity into a smaller transmission line corridor. HVDC lines increase transmission efficiency and minimize land use impact with smaller towers and reduced right-of-way requirements compared to AC lines. HVDC may accommodate long-term growth without the need for future construction in a corridor. CPC encourages the Commission to consider transmission line technology as a part of its deliberations.

C. Smart Grid Technology

The smart grid holds the promise of transforming the current electricity delivery system into a more efficient and secure system that is better able to integrate variable supply sources while giving the end-user greater autonomy in their energy consumption. Smart grid technology is designed to improve how power is delivered and utilized, and for British Columbia offers an important means to integrate significant amounts of intermittent renewable supply into the overall provincial supply portfolio. CPC would fully support the Commission's evaluation of the impact of smart grid technology on generation, transmission, and distribution and the issuance of appropriate recommendations in that regard.

V. Areas Inappropriate for Generation (and Transmission) Development

The Staff Discussion Draft suggested a distinction between generation resources and transmission for purposes of assessing which areas are inappropriate for development. While that interpretation is consistent with the letter of the Terms of Reference, CPC submits that it may be inconsistent with the spirit. Recent experience leaves no doubt that transmission development may be vigorously opposed in some areas. In any event, federal restrictions on development in certain areas (e.g. National Parks) will not be diminished by terms of reference issued by British Columbia.

Prudence demands that the Commission's assessment of areas inappropriate for development contemplates transmission projects, not only generation facilities. To do otherwise would unwisely ignore potential opposition that could delay or prevent

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transmission projects, thereby increasing the risk that implementation of the Commission's Inquiry recommendations may be frustrated.

All of which is respectfully submitted.

CPC looks forward to responding to any questions or concerns regarding the foregoing at the upcoming Workshop and Procedural Conference.

Yours truly,

{Signed by}

Glenn MacIntyre
Director, Regulatory & Government Affairs
Columbia Power Corporation