

British Columbia – Alberta Transmission Interconnection

1.0 Introduction

Historically, Canadian provincial electricity markets have had better transmission connections with US markets than with neighbouring Canadian markets. Given the increasing concerns around energy security and access to US markets arising from recent trade actions, greater attention is being paid to east-west transmission.

This paper examines the situation between Alberta and British Columbia, highlighting opportunities for greater interconnection, and addressing key issues that must be resolved to bring these opportunities to fruition.

2.0 Existing Arrangements

The BC-Alberta Intertie is comprised of three transmission lines between British Columbia and Alberta and the nominal rating on the intertie is 1,200 MW from BC to Alberta and 1,000 MW from Alberta to BC.

The BC side of the intertie is owned and operated by BC Hydro, while the Alberta side is operated by the Alberta Electric System Operator (AESO) and owned by Altalink. Intertie capacity is managed by each province's respective system operator on each side of the border.

3.0 Current Technical Issues

Notwithstanding the nominal rating, the two system operators have implemented different capacity ratings on each side of the border based on their assessments of reliability impacts on their respective systems.

Each operator must consider the impacts of events on their own system – both those caused by events on the Intertie and those caused by other system events that affect the Intertie. Each system operator conducts engineering studies on their respective electricity systems to confirm the impact of an event on the Intertie on their system, and the impacts of other system events on the Intertie.

Since a loss of generation or transmission line outage on the system must not cause any part of the system to operate outside established limits, it may be expected that a lower power flow limit may be required on the Intertie to ensure stable operation after an outage.

BC Hydro indicates that their system typically permits imports of up to 90% of the intertie's capacity into BC, while AESO restricts imports to a much lower value – between 40% to 60% of the intertie's nominal rating.

It is not surprising the Alberta system would have different import/export limits compared to BC, given BC's greater interconnection to the US and the dominant role of hydro generation in BC, which contributes to system inertia.

AESO should be able to produce engineering studies confirming their reduced limit compared to British Columbia. Significantly increasing the transfer limit in the Alberta system may require the addition of a second 500 kV transmission line between the two provinces.

4.0 Current Market Issues

Notwithstanding technical operations, the intertie crosses two different markets, each with its own rules and regulations. This creates the potential for a "seam" between the two markets, where the rules on one side of the intertie are inconsistent with those on the other.

An example of a seam arises from the difference in transfer capacity on either side of the BC-Alberta border. BC Hydro could make 900 MW of transfer capacity available for sale on its side of the border, but only 400 MW is available in Alberta. As a result, the purchaser of the "extra" 500 MW of capacity in BC has no ability to use it in Alberta.

Another seam could arise if AESO establishes new rules for access to transmission capacity in Alberta as part of its market restructuring. BC Hydro's trading company, Powerex, currently holds rights in BC, but if AESO market rules make transmission available to others in Alberta, the pre-existing rights in BC would be of no practical use in Alberta.

BC Hydro has also observed that Alberta is gaining access to reliability services provided by BC without compensation by limiting the transfer on the intertie. They are dissatisfied with the lack of progress made by Alberta in increasing the transfer capacity on the transmission line and the ongoing challenges in addressing the seams between the two markets.

5.0 Benefits of the Intertie

Limits on transfer capacity and differences in market rules undermine the usefulness of the intertie, including:

- a) Reducing the cost of energy to markets on both sides of the border
Enabling imports to compete with domestic electricity supplies can reduce generation costs during peak periods and reduce the market power than can be exerted by other market participants. Additionally, the intertie allows surplus energy to be exported rather than curtailed during periods of low demand.
- b) Increased reliability of both systems
The intertie enhances reliability in both systems by spreading disturbances over a larger network, reducing their impact compared to “islanded” operation.
- c) Increased operational flexibility
The intertie allows for the sharing of reliability resources over a larger area. For example, reserves and balancing resources could be shared across both systems to address events affecting the combined system.
- d) Increased import / export opportunities
The intertie opens new markets on both sides of the intertie to generators on the other side.

6.0 Areas of Contention

A review of the comments regarding AESO’s market restructuring reveals a range of perspectives on the role of energy imports in the Alberta market.

Some commentators have observed that imported energy can lower costs for consumers by increasing competition and expanding markets. However, others have voiced opposition to market participation by outside competitors, arguing that companies external to Alberta are benefitting from participation in the Alberta market, to the detriment of Alberta market participants.

This situation is exacerbated by Alberta’s energy-only market structure, which provides no direct incentive for making capacity available. Alberta-based generators assert that undermining on-peak revenue streams reduces the incentive for capacity investments in the Alberta market.

7.0 Potential Paths Forward

For the parties to successfully navigate a path forward, the participants will need to share the benefits available from the interconnection. A successful outcome would likely include the following features:

- a) Mechanisms to address the seams issues between Alberta and BC.
The ability for either party to unilaterally interfere with trade represents a fundamental problem; the parties need to reach some agreement on market participation to resolve this.
- b) Mechanisms to enable BC Hydro to compete effectively in the Alberta market
While competition benefits Alberta customers by capping market power of local generators, too strong a disincentive could compromise reliability by discouraging capacity investment to meet Alberta peak demands.
- c) Demonstrate two-way trade
A commitment by BC Hydro to purchase energy from the Alberta market during dry periods would demonstrate the mutual benefits of the interconnection.
- d) Demonstrate Reliability Benefits in both BC and Alberta
Sharing reliability benefits – such as first contingency reserves, regulation, and balancing – proportionally between the two markets would benefit customers in both provinces.

A clear demonstration of benefits may further support increasing transmission capacity between the two markets.

8.0 Outstanding Questions

How the provinces and their utilities/system operators approach this discussion will be heavily influenced by their stance on investment on interprovincial trade in general. To what extent are they seeking increased economic efficiency for their customers, and to what extent are they advocates for investment and employment within their own province?