

Updated Inputs: Electricity Load Forecasts in Fort Nelson and the Horn River Basin (FN/HRB)

PURPOSE

To provide information on updated load forecasts related to Fort Nelson and the Horn River Basin shale gas developments and the implications on the IRP analysis.

OVERVIEW

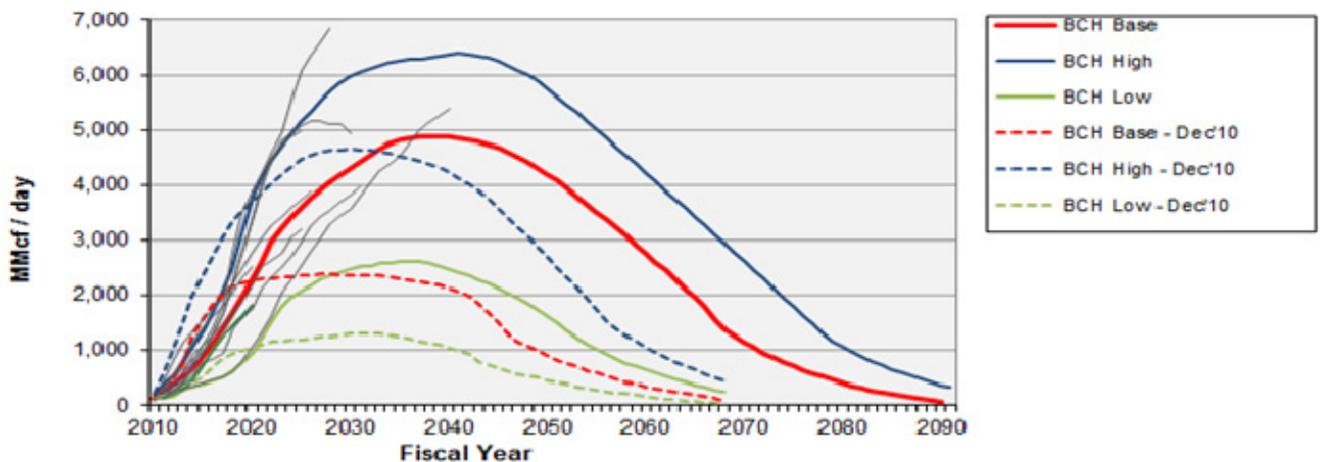
BC Hydro’s previous summary brief (TAC Meeting #3) on the Horn River Basin (HRB) provided an overview of the electrification challenge, gas production estimates and associated work energy requirement, the type and location of the various work loads in the HRB and the various options available for supplying the estimated work energy requirements. The summary brief also provided a summary of preliminary findings and outlined the scope of the proposed portfolio analyses.

This overview provides a summary of key changes to some of previous input assumptions and analytical approach. The main implication of these changes to the Integrated Resource Plan (IRP) analysis is an increase in the magnitude of potential electrical load to be served in the HRB.

INPUT ASSUMPTIONS

Based on more current market assessments, BC Hydro substantially revised (upwards) the range of gas production volume that could be economically developed in the HRB. Figure 1 contains BC Hydro’s three scenarios of HRB shale gas production (high, mid and low in red), last year’s mid forecast (dotted) and forecasts from 14 experts. BC Hydro’s mid scenario identifies a peak production of 4,900 million standard cubic feet per day (MMSCF/day), which is twice the 2,400 MMSCF/day forecasted in last year’s mid forecast. Experts have also dramatically increased their production expectations for the HRB. Note that BC Hydro’s current mid scenario lies well within the range of the forecasts from the industry experts.

Figure 1: HRB Shale Gas Production Forecasts



ANALYTICAL APPROACH

The main purpose of the analysis is to assess the potential electricity requirements associated with providing service to Fort Nelson/HRB regions.

Three B.C.-based electricity supply alternatives based on system clean energy and local gas-based generation, described below, are being assessed within the IRP. Additional supply options were also identified, namely: Fort Nelson and HRB remaining isolated from the interconnected system, while relying on clean, intermittent resources and additional supply from Alberta. However these alternatives have been discarded for a combination of technical, jurisdictional and economic reasons.

The electricity supply alternatives being considered are as follows:

Alternative 1 – Northeast Transmission Line (NETL) Supplying Fort Nelson/HRB With Clean/Renewable Energy From The BC Hydro Existing Transmission Grid

BC Hydro constructs and operates a high voltage transmission line from the Hudson's Hope area (GM Shrum / Peace Canyon area or suitable site along the transmission grid) to Fort Nelson and continuing north-northeast to Cabin, in the Horn River Basin. This alternative would include a sub-transmission facility connecting Cabin to various raw gas treatment (RGT) facilities within the Horn River Basin area.

Depending on the route identified, there is a potential for the NETL to:

- interconnect up to 1500 MW of potential renewable generation projects such as wind generation in the Hackney Hills area, about 100 km north of Hudson's Hope.
- serve natural gas production-related loads and other potential loads (pipeline, mining) in the 200-500 MW range in the west side of Montney Basin area, about 100 km north of Hudson's Hope.

Alternative 2 – Local Thermal Generation Supplying Both Fort Nelson/HRB

2A – A new high voltage transmission line connecting the HRB to Fort Nelson and new gas-based thermal generation is developed in both regions to serve the combined load.

It is assumed gas-based generation is developed near existing gas processing plants (at Fort Nelson) and new gas processing plants (within the HRB at Cabin) to maximize power and process heat efficiency (i.e., cogeneration). As with Alternative 1, a sub-transmission network is developed within the HRB to connect to major load centres (gas processing at Cabin and compression load at the various RGT facilities).

CCGTs sited at Fort Nelson that do not include thermal heat sales, are being analyzed as an alternative to cogeneration.

2B – Under this alternative, there is no transmission connection between Fort Nelson and the HRB. Cogeneration facilities are developed in the HRB to serve just HRB load. As with Alternative 1 and Alternative 2A, a sub-transmission network is developed within the HRB to connect to major load centres (gas processing at Cabin and compression load at the various RGT facilities).

Load growth in Fort Nelson is addressed separately with either local gas generation or incremental supply from Alberta.

Alternative 3 – Fort Nelson-Only Supply

Under this alternative, HRB gas producers would self-supply their energy requirements while BC Hydro continues to supply existing and future Fort Nelson load.

The options for serving Fort Nelson load are continued/increased firm service from Alberta and new gas-fired thermal generation at Fort Nelson.

LOAD ASSUMPTIONS

Each of the HRB supply alternatives (1 and 2) will be modeled under the following load scenarios:

- high HRB gas production; heavy electrification (90% to 95%), including electrical load for carbon capture and sequestration (CCS);
- mid HRB gas production; moderate electrification (75% to 80%), including CCS load; and
- low HRB gas production; low electrification (65% to 70%), including CCS load.

BC Hydro's costs associated with the three alternatives described above will be assessed. GHG impacts inclusive of estimated GHG emissions associated with industry self-supply and formation CO₂ will also be assessed.