2021 Long Term Electric Resource Plan (LTERP) & 2022 Long Term Gas Resource Plan (LTGRP) – Kelowna

October 8, 2019

Green items denote follow-up questions for FEI. FEI's responses use **bold black** font.

1. **Introductions**
    a. Attendees expressed interest in the following topics:
        i. Management and integration of intermittent energy resources with changing energy demand profiles.
        ii. Natural gas for transportation (NGT) and electric vehicle (EV) programs and opportunities.
        iii. Pilot projects for technology demonstration and new initiatives.
        iv. Data sharing and collaboration to improve individual stakeholder planning processes and support regional growth and development.
        v. Greenhouse gas (GHG) emissions reduction opportunities.
2. **Resource Planning and British Columbia's (BC) Energy Systems**
    a. Attendees recognized that achieving BC's legislated economy-wide GHG reduction targets may increase energy costs.
    b. They noted that it is important to look at the big picture to identify the most actionable and affordable opportunities for GHG abatement:
        i. Community members expect that GHG targets will get more stringent in the future but highlight that affordability in terms of energy costs and tax impacts needs to be a key consideration.
        ii. A prudent approach includes testing which sectors of the economy are most impactful and amenable for GHG-related interventions:
            1. The transportation sector is responsible for a large proportion of BC's GHG emissions.
            2. Some concern exists that emissions increases in this sector could outpace emissions abatement in the built environment.
        iii. GHG abatement efforts also need to move beyond artificial silos:
            1. For example, school boards are encouraged to move student transportation from private means to school buses but this increases their own GHG emissions while reducing private emissions – this reduction is not counted against the school boards' GHG targets.
            2. Attendees clearly recognize the benefit of pursuing opportunities for emissions abatement across strict jurisdictional boundaries – this includes opportunities outside of BC and Canada.
    c. One attendee asked whether, given historical performance, BC's GHG reduction targets are realistic.
3. **Electricity Planning Dialogue**
    a. Attendees discussed various opportunities and considerations around EVs:
        i. Are EV charging incentives available for wholesale electricity customers?
            1. **Rebates through the BC EV Charger Rebate Program (administered by BC Hydro and FortisBC) are available to customers served by FortisBC's**

electricity wholesale customers (Penticton, Summerland, Grand Forks, Nelson).

ii. FortisBC Level 3 direct current (DC) charging stations currently cost about $9 per 30 minutes of charging time:
    1. This is based on subsidies that FortisBC received from third parties which cover about 75% of the capital cost of the charging station.
    2. Charging costs for an unsubsidized station could be about $21 per 30 minutes.

iii. Managing EV charging impacts on the electric infrastructure:
    1. FortisBC's preliminary long term forecast of 35,000 EVs in its electric service territory accounts for about 3-4% of its annual electricity demand – peak capacity impacts of EVs will be the real issue to consider.
    2. One Level 3 DC charging station has about the same peak demand impact as one electricity-intensive single family dwelling.
    3. In general, electricity system capacity utilization rates are relatively low – utilities and customers could use EVs as an opportunity to increase the utilization factor in order to reduce system costs in the long run.
    4. Utilities could try to educate customers about what charging patterns are best for their EV batteries in order to avoid short term charging-related power spikes in the distribution system.
    5. Utilities and/or customers could invest in electricity storage infrastructure to smooth EV charging-related demand spikes (EVs themselves could act as grid-connected storage devices):
        a. Such infrastructure would need to be managed in order to fully realize its load smoothing function – some pilot projects for automating this process exist in other jurisdictions (e.g. Australia).
        b. Establishing such infrastructure and management requires the following considerations:
            i. How would utilities and customers share the costs and benefits of the required investments? - consider, for example, incentives for customers to install home batteries that are accessible to be remotely managed by utilities.
            ii. How can such infrastructure be managed by utilities in a manner that is transparent to customers? – for example, capacity charges exist as a price signal for commercial customers but residential customers may not understand them or may not have the ability to shape their load in response to such charges.
        c. Experience from other jurisdictions suggests that an opportunity to approach customers about these opportunities is when they request updates to their power service from an electrician in order to install home EV charging stations.

b. Attendees also discussed distributed generation opportunities and considerations:
    i. Education institutions are installing solar photovoltaic (PV) generation systems at their sites:

1. Incentives for the capital cost are available from SolarBC for up to about 80% of the installation cost.
2. Solar PV installations on existing buildings can increase roof maintenance and re-roofing costs – installations on top of parking lots are better from this perspective.
3. Such installations are economically attractive only if the institution uses enough electricity to use all the self-generated electricity – net metering rates alone would not make installations economic.

ii. Community members pursue solar self-generation because they see this as the right thing to do, even though a majority of BC's electricity supply is renewable already.

iii. At the moment, the regional power market does not include a sustainable mechanism for transacting renewable capacity at rates that are economic for suppliers – growth of intermittent renewable generation means that power is sold at negative prices during peak generation periods (such periods often do not coincide with peak demand periods).

c. Finally, attendees expressed their preferences about the provenance of electricity supply:

i. For covering future supply resource needs, FortisBC has the option to invest in electricity generation in BC or to purchase electricity from the regional supply market.

ii. Purchases from the regional market can be cheaper than local generation – BC can use its geographic advantage in hydroelectricity to purchase cheap power during regional supply gluts.

iii. Market purchases may be 100% renewable or could include a portion of fossil-fueled electricity generation.

iv. Attendees recognize that climate change is a global issue and that energy affordability plays an important role in BC – they support FortisBC purchasing relatively cheaper electricity from the regional market, especially if these purchases can be verified to be renewable electricity.

v. Attendees note that energy affordability benefits of market purchases should be weighed against the economic development and employment benefits of investing in electricity generation in BC

vi. Attendees also feel that regional market purchases should not reach a level where they would compromise the reliability of FortisBC's electricity supply portfolio.

4. Natural Gas Planning Dialogue

a. Institutional customers treat their capital budgets separately from their operating budgets and this shapes their energy decisions:

i. They will prefer capital intensive energy upgrades over choices that would increase their ongoing supply costs – for example, customers prefer energy efficiency projects to reduce GHG emissions over purchasing renewable gas in their supply mix.

ii. For this reason, customers will also switch gas appliances to electric heat pumps rather than upgrading to more efficient gas appliances and purchasing renewable gas in their supply mix:

1. Customers feel that switching to electric heat pumps reduces GHG emissions by 100% and that the added efficiency of heat pumps will

compensate for the current price premium of electricity over renewable gas
2. Customers assume that electricity rates could rise by up to 5% per year but also note that natural gas commodity costs could return from their current level to historical highs.
3. Higher carbon offset prices for institutional customers could change this dynamic in favor of renewable gases – current offset prices are $25/tonne of CO_2 equivalent emissions.

iii. Similar dynamics apply to transportation fleets – customers will use capital to upgrade their fleets in order to reduce operations costs and reduce GHG emissions rather than seeking operations mechanisms for the same outcomes:
1. Customers appear more aware about capital incentives for electric fleet vehicles than incentives for natural gas vehicles.
2. Customers agree that technological evolution in electric and natural gas transportation means it is currently not clear whether electric or natural gas or fuel cell vehicles will be the dominant choice for medium/heavy duty applications in the future (some comments indicated belief that natural gas fueling infrastructure for vehicles is costly, there may not be enough RNG and that transport electrification is the way of the future).

b. Attendees expressed their opinions about current and future energy performance codes and standards:
i. For the BC Energy Step Code, builders and building trades across the province have increased their capacity quickly – a majority of communities across BC are pursuing Step 3 of the code ladder directly rather than starting with lower steps.
ii. Communities are unclear about provincial and federal government plans for introducing a retrofit code – communities note that this would likely have significant impact and that senior levels of government will need to increase funding to communities in order to enable implementation of retrofit codes (attendees suggest that such transfers have not increased in past years).

c. Attendees highlighted that an opportunity may exist for better integrating gas and electric energy systems in the future in order to increase reliability and optimize costs:
i. Residential dwellings could use electric heat pumps for their base heating and cooling loads and could rely on gas-fueled combined heat and power units (CHP) for peak heating demand, smoothing overall electric load, and added reliability:
1. Japan has successfully deployed such integrated setups.
2. CHP units could be fueled by renewable gases in the future and thus further reduce GHG emissions and support energy innovation.

ii. Such integrated end use energy systems may be more complex to manage and maintain than existing separate systems – this may present an opportunity for alternative energy systems providers to offer customer solutions that complement FortisBC electric and gas utility services.

5. General Feedback and Next Steps

a. Attendees support FortisBC sending workshop invitations as calendar meeting requests – this represents a more actionable method than sending invitation emails with a link to a subscription system
b. Attendees encourage FortisBC to include a conspicuous subject line with workshop invitations in order to draw attention to them.