SESSION NOTES

BC's GHG Reduction Pathways Study - Implications for FortisBC's Long Term Resource Plans

Friday, February 12, 2021

Green items denote questions or comments for FortisBC to follow-up on/consider
Orange items denote FortisBC responses to follow-up questions

ATTENDEES

Avista Utilities, Tom Pardee
BC Business Council, Denise Mullen
BC Hydro, Bill Clendinning
BC Institute of Technology, Kerly Hitchcock
BC Ministry of Energy, Mines and Low Carbon Innovation, Jack Buchanan
BC Ministry of Energy, Mines and Low Carbon Innovation, Jennifer Davison
BC Ministry of Energy, Mines and Low Carbon Innovation, Jiya Shoaib
BC Ministry of Energy, Mines and Low Carbon Innovation, Katherine Muncaster
BC Ministry of Energy, Mines and Low Carbon Innovation, Katherine Rowe
BC Ministry of Energy, Mines and Low Carbon Innovation, Paul Wieringa
BC Ministry of Energy, Mines and Low Carbon Innovation, Steven Groves
BC Non Profit Housing Association, Brian Jung
BC Sustainable Energy Association, Tom Hackney
BC Utilities Commission, Gillian Sykes
BC Utilities Commission, Nicola Simon
BC Utilities Commission, Phil Stallard
Building Owners and Managers Association, Damian Stathonikos
Canadian Biogas Association, Jennifer Green
Canadian Institute of Plumbing and Heating, Andrew Dyck
Chinook Power, Stephen Cheeseman
City of Abbotsford, Anna Mathewson
City of Burnaby, Dipak Dattani
City of Campbell River, Chris Osborne

City of Kelowna, Danielle Noble-Brandt
City of Kelowna, Tracy Guidi
City of New Westminster, Leya Behra
City of Prince George, Melissa Barcellos
Clean Energy Association of BC, Steve Davis
Community Energy Association, Dale Littlejohn
District of Saanich, Rebecca Newlove
Enbridge, Rick Rautenbach
Guidehouse, Andrea Roszell
IBC Technologies Inc, Don Peladeau
LandlordBC, David Hutniak
Love Energy Consultants Inc, Peter Love
Metro Vancouver, Conor Reynolds
Metro Vancouver, Nicole Chan
Midgard Consulting, Peter Helland
MoveUp, Rysa Kronebusch
Natural Resources Canada, Christopher Frye
North West Gas Association, Dan Kirschner
North West Natural, Matt Doyle
Pacific Northern Gas, Al Kleinschmidt
Pembina Institute, Betsy Agar
Pembina Institute, Tahra Jutt
Roger Bryenton & Associates, Roger Bryenton
Sea to Sky Energy Solutions, Darren Young
Sea to Sky Energy Solutions, Peter Zell
Union of BC Municipalities, Marie Crawford
University of Victoria, Andrew Rowe
Village of Keremeos, Christopher Wood

PLENARY

Welcome, Introductions & Session Overview

- Attendees outlined the following reasons for attending the session:
    - Interested in how FortisBC long term resource plans align with BC government objectives and meeting GHG reduction targets
    - Interested in learning more about the Energy Pathways Study and how it relates to municipal climate objectives

- Interested in impacts of the study on rental housing sector
- Interested in what's going on at FortisBC
- Interest in transforming BC's energy use to sustainable energy
- Interested in motivating, influencing and facilitating change away from fossil fuels
- Interested in how FortisBC's plans to decarbonize all types of transportation
- Learning more and leveraging synergies
- Learning more about the use of hydrogen, renewable gas and fuel cells
- Looking for linkages to the regional Climate 2050 strategy
- Representing the interests of FortisBC employees
- Representing residential customer interests

Background on Long Term Resource Planning & Demand Side Management Planning

- **Attendee**: Why is there no petroleum or coal long term resource plan in the province? The BC government should complete a plan for all other energy resources used in the province.
  - **FortisBC**: This is outside the scope for FortisBC to address. Saying that, the province of BC doesn't use coal or petroleum for power generation and while petroleum is used within the province, it is not done through a utility.
  - **Facilitator**: Good question, we'll document this in the session notes. Are there further questions specific to FortisBC's Long Term Resource and Demand Side Management Planning?
  - **Attendee**: Noted that coal is only used for export and in the production of steel.

Pathways for British Columbia to Achieve its GHG Reduction Goals

- **Attendee**: How did each pathway compare to the climate change risks (for example: increased storms, rising sea water, etc.)?
  - **Guidehouse Consulting**: We didn't complete climate modelling specifically in each scenario to be able to identify the impact of climate risks because both pathways will endure the same risks. The modelling was an energy and economic exercise.
- **Attendee**: How are we doing as a province with GHG reductions to date?
  - **FortisBC**: In terms of the total volume of emissions, it's been a flat progress over the last 5 years.
- **Attendee**: Does that assessment of resilience account for a diversified electricity system (for example: on-site renewables and storage with integrated micro-grids)?
  - **Guidehouse Consulting**: We looked at the least costly option in order to reduce total costs for the Electrification Pathway. We didn't look at a diversified electricity system due to costs of implementing such a system. However, you are correct that a diversified electricity system would make the Electrification Pathway more resilient.
  - **Attendee**: I think this is something we should be thinking about as a province – not just FortisBC but also BC Hydro.
  - **FortisBC**: We will keep this comment and others like it in mind as we go through the resource planning process.

- **Attendee**: Can the strategies/actions in the Diversified Pathway get us to a zero carbon target by 2050? Or do they commit to investments and a pathway that cannot reach zero carbon?
    - **FortisBC**: The dialogue on net zero has been developing more recently. As such, it was not looked at in this study. Getting from 80% reductions to zero is a fundamentally different challenge. FortisBC is doing some preliminary research on net zero and will look at how some of the themes from this study carry over.
- **Attendee**: How do both pathways align with the 2030 CleanBC target?
    - **Guidehouse Consulting**: Both pathways incorporate the CleanBC target for 2030.
- **Attendee**: How much does the Diversified Pathway depend on technological innovation to deliver cost-effective renewable gas from processing woody biomass?
    - **Guidehouse Consulting**: The amount of RNG and associated cost was based on the Hallbar Consulting study "Resource Supply Potential for Renewable Natural Gas in BC". The cost increases as you move to different sources and different technologies that are being utilized, and this is accounted for in the modelling.
    - **FortisBC**: The REN RNG project that we have BCUC approval for will create RNG from processing woody biomass, and the price that we are paying REN for RNG is within the GGRR cap of $30/GJ.
- **Attendee**: Great charts and explanations! The resiliency of the natural gas system mitigates the risk of the energy system as a whole.
- **Attendee**: Is all of this analysis done with respect to FortisBC's customer base only or all of BC?
    - **Guidehouse Consulting**: The Energy Pathways Study looks at all of BC.
- **Attendee**: Would it be fair to say that there is more uncertainty in costs as you go out more than a decade in time (for example: if you added error bars, you would see that confidence drops off in in the accuracy of the cost difference estimates)?

    - **Guidehouse Consulting**: Yes, there is certainly cost uncertainty in both pathways. There is also uncertainty around new technologies and technologies that are not as advanced at this time. Saying that, the analysis still indicates that the Diversified Pathways would be less expensive.
- **Attendee**: Are the environmental and social impacts of RNG substantially different from full electrification, not just economic effects?
    - **Guidehouse Consulting**: Study did not look at environmental and social impacts. It was an energy resource looked at economically.
- **Attendee**: How were the costs for the two pathways developed? What certainty of supply/deliverability risk analysis was undertaken to address feasibility for both paths?
    - **Guidehouse Consulting**: Costs were developed based on initiatives and infrastructure required. For RNG, we used potential. For peak issues, we didn't look if it was possible to build out the infrastructure to deliver – there is uncertainty about the supply.
    - **FortisBC**: Guidehouse Consulting used BC Hydro rate application filings for input data. We looked at expanding hydroelectricity – on a blended rate – as this is the most cost effective. The RNG was based on studies and on Guidehouse Consulting information.

- **Attendee**: How were air quality impacts considered within the report?
    - **Guidehouse Consulting**: Not addressed.
- **Attendee**: If industrial need for heat is a large component, how can we effectively address this?
    - **Guidehouse Consulting**: Response was not captured in the notes but the issue of meeting industrial energy needs will considered in the FortisBC Long Term Resource Plans.
- **Attendee**: Interested in knowing whether the analysis looked at specific users related to demand and the peak demand? For example, is it primarily residential or are there some major industrial sites with high demand/peak demand? Did the analysis look at where the renewable gas/hydrogen supply could be generated and focused to meet that demand/peak vs. blanket across BC/residents/all users?
    - **Guidehouse Consulting**: We did look at peak across all sectors and applied appropriate demand profiles to see what peak demand would look like. We didn't do a detailed look around where hydrogen and RNG is allocated or which pipelines would be dedicated to these fuels.
    - **FortisBC**: There are a number of factors to consider (such as EV). FortisBC is looking at this more closely with Guidehouse Consulting to see what the heat demand would look like.
- **Attendee**: The "Clean Growth Pathway to 2050" document says, "We (FortisBC) see ourselves as an energy delivery company". If FortisBC were to see themselves as providing "Comfort and Convenience", they could invest in customers' business - better buildings, improved industrial processes, etc. and help finance the changes at the use end, not just supply.
    - **FortisBC**: We are doing a great deal to help customers in the demand management side – spending around $100 million to help residential, commercial and industrial sectors reduce energy use and increase efficiency.
- **Attendee**: I think we are facing a huge challenge; a transformation. How do we finance this?
    - **FortisBC**: This is an important question and draws back to some of the opening remarks on the utilities' responsibilities to provide safe, secure and cost effective energy supply – these are fundamental principles. Pursuing a diversified future ensures we don't go down a single technology pathway that locks in higher costs.

<u>Implications for FortisBC's Long Term Resource Plans</u>

- **Attendee**: Is it possible that Solar or wind from Alberta might be less expensive than other new energy, or that FortisBC could add generation capacity to Duncan Dam instead of relying upon BC Hydro?
    - **FortisBC**: Resources from Alberta are an option however they do not fully address the peak capacity concerns as highlighted in the analysis. Approximately 9000 MW of peak resources are required to meet the annual peak. These resources will also be generating energy for the entire year. To put in context, the annual generation from these peak resources provides only half of the required generation to meet annual energy load. The remaining energy is provided almost fully by variable renewable resources.
    - **Attendee**: Wind pricing at point of interconnection seem lower in Alberta than many other jurisdictions, but transmission would add to that. That said, those are energy

resources, and the more difficult problem is capacity more than energy into the next two decades. For Duncan Dam I couldn't be quoted off the top of my head but I think Columbia Power examined the cost and found upgrades wouldn't be competitive with other clean options. With renewables dropping, I'd guess that would still be the case. Again, I'm speaking informally with you here.

BREAKOUT GROUP DISCUSSIONS

Group 1

- Key takeaways from the discussion:
    - Encouraging to see natural gas being explored as part of the solution and following in the steps of other jurisdictions by assessing a diverse energy future.
    - The issue around risk and variability of supply should be kept top of mind and we should not lose sight of affordability when we talk about pathways forward.
    - BC government should explore our accounting system because we are at a disadvantage in terms of balancing our GHG emissions – we already have a very clean electricity system so reducing emissions is more difficult and expensive than other jurisdictions who can transition from coal. We need to consider policies that do not raise the costs too high, too fast, and push away resource industries which are they to BC's prosperity.
    - We need to further explore the challenge ahead for existing buildings. The Diversified Pathway would open opportunities other than electrification but there are many considerations that need to be explores – especially when it comes to housing (for example: rent control considerations).
    - Feeling that there is a mis-framing of the two pathways. When comparing the Diversified Pathway and the Electrification Pathway, we should recognize that both have aspects that make them diversified. For example, the Electrification Pathway still includes RNG. In addition, the assumptions built in can make or break the analysis, we should have more opportunity to discuss and understand these assumptions. Thinks we should use this study as a piece of information but continue looking at options as we move forward not lock into one pathway.
    - Costs are an important factor to consider. Currently the cost of natural gas is so low that it's difficult to compare alternate energy supply options. We should also keep in mind that increased costs are not always a bad thing as it often comes with new opportunities for businesses and residents (for example: high paying jobs).
    - Is there an opportunity to have sector specific deeper dives with FortisBC (housing, industry, etc.)?
        - FortisBC is currently conducting a 'deep dive' on the buildings sector and will be consulting with external stakeholders on a buildings and renewable gas roadmap this spring. This roadmap will inform pathways for FortisBC to provide low-carbon solutions in the buildings sector aligned with provincial goals.

Group 2

- Key takeaways from the discussion:
  - Happy to see FortisBC embark on such a comprehensive study.
  - Resiliency is important, we need to consider this factor in the plans we make today that will set the stage for the future energy system and our capacity to respond to climate change.
  - In the non-profit housing sector, there is a decoupling that happens between who covers the cost of energy retrofits (for example: housing providers making decisions based on their GHG targets) and the ongoing operating cost (i.e. born by the housing provider). There are concerns of the implication of this because it can lead to energy poverty over time and compromise the affordable housing stock in the province.
  - Dual fuel systems are preferred because of three imperatives to maintain: building/facilities resilience, the comfort of tenants and affordability. Furthermore, dual fuel systems can provide housing providers flexibility to respond to energy price fluctuations over time and mitigate the risks associated with switching the way fuel system of a building, particularly when it comes to the heating system.
  - Is there an opportunity to hear more about the assumptions around RNG stock? In particular when it comes to competition with other compliance systems (like LCFS) and other jurisdictions in North America who might be competing for the same RNG (through credits, if not the actual molecules).
    - The supply of RNG was assumed to come fully from BC. Approximately 10 PJ of supply would come from traditional RNG from anaerobic digestion of municipal solid waste, agricultural waste and landfills. 80 PJ would come from second generation RNG production from woody biomass wastes from BC's forestry sector. 30 PJ would come from hydrogen production and an additional 10 PJ would come from synthetic methane derived from hydrogen.
- FortisBC to consider the following:
  - What are the opportunities for the renewable energy providers to engage/partner?
  - What is the implications of load growth for communities, particularly since a large proportion of the growth is likely centered in the Lower Mainland and Victoria? Is there receptivity from these communities for such infrastructure to be placed in their backyard?
  - What is the carbon intensity of the hydrogen you reference in Diversified Pathway?
  - Where are the GHG reductions coming from if we expect to see growth in the system? Are the new renewable gases meant to account for the increased demand? What is the net growth in conventional gas and renewable gas?
  - What is the certainty that we will be able to hit the levels of renewable gases stated in the diversified pathway?
  - What is Fortis doing to support building envelope upgrades?
  - What risks are we taking on if one pathway over the other?
  - What is the value/cost (i.e. quantification) of resiliency?

- What are the costs in the diversified pathway model of energy use versus system's capacity?
- Was a sensitivity analysis done? What about other price/ inputs? Was demand response considered for peak load on the analysis?
- Can the role of dual fuel systems be accounted for in the modeling? Is there a way to capture the sunk costs related to buildings that are required to take out their gas infrastructure since there has been significant investments made (including in efficiency) over time?
- Could there be disruptive technologies that come into place that are more cost effective, efficient and beneficial than the energy systems you are including in your modeling? This could make both pathways irrelevant. How are utilities planning for considerations of disruptive technologies?

Group 3

- Key takeaways from the discussion:
  - Would like to see more collaboration between FortisBC, BC Hydro and the Province's plans. It would be valuable to review and understand what assumptions are being used in plans and how these assumptions align.
  - Social equity and affordability needs to be at the forefront. Rate design is important for either pathway.
  - The longevity of DSM and energy efficiency programs is going to be critical.
  - Concerns around stranded assets as these will ultimately be borne by ratepayers and municipalities.
- FortisBC to consider the following:
  - How will stranded assets be taken into consideration in future pathways? Are we investing money in infrastructure that is not going to be the useful in the future?
  - How will peak demand and energy storage come into play in the two pathways?
  - How will hydrogen be allocated? What is the timeframe for hydrogen vehicles and hydrogen injection?

Group 4

- Key takeaways from the discussion:
  - Economic and social impacts are important and should be considered when evaluating the pathways forward.
  - Energy poverty and cost of energy to residential customers is important as electrification can be costly.
  - Agree with the approach to utilizing the energy systems available to us in order to reduce risk and increase resiliency.
  - Need better understanding and reconciliation of the differences between the Pathways assumptions and BC Hydro's electrification impact report.
  - Need to continue exploring partnerships to make an energy transition successful, this includes local governments.

- FortisBC to consider the following:
    - Is there a regional strategy for the Pathways? Northern communities may have unique circumstances and priorities and ways to achieve goals.
    - What about trades training for a successful pathway?
    - There is a lot of policy uncertainty and policy environment now is volatile. How will this affect how the scenarios play out?
    - Will FortisBC produce energy or just buy and sell (i.e. middleperson)?
    - Will FortisBC produce energy and influence customers – changing role of the utility?

Group 5

- Key takeaways from the discussion:
    - Presentation was great and reinforced subtly the challenges we are facing. We need to relay this message more to the general public.
    - We have to do everything; cannot focus on just one area. We need to look at diversification. It's exciting to see FortisBC undertaking this study. Municipalities are looking at reducing GHG emissions and it would be useful to see how the plan intersects with the municipality plans.
    - A layer which is absent is the psychology on change management. We have a high dependency on groups, industry, and the general public to onboard technology and making consumer choice. This is a layer necessary to understand to achieve targets.
    - Capacity factor to meet demand particularly on the coldest days and relevance of line pack in the gas system would be helpful to understand the known problems of capacity potential from BC Hydro. Would be good to see a similar work done by BC Hydro; maybe a collaborative review on this front.
    - Model depends on technological innovation to keep costs down to ensure this is a cost-effective resource. Government 15% RNG contribution in the CleanBC plan seems very ambitious, a large amount of reliance on this source. Doesn't seem that this amount of fuel is available at a cost-effective price. Look forward to more analysis and contribution to discussion.
    - Need to relay this discussion to general public, ideally a cohesive message between the province, the utilities and other key industries. Buy in is important and we need to spread the message and inform the public about what is at stake.
    - Keep the modelling and dialogue open as the energy landscape is shifting so quickly. The model should be updated and refined as we move forward.
    - More coordination is needed between BC Hydro and FortisBC. Perhaps exploring a joint resource plan to ensure alignment between the main utilities in the province.
- FortisBC to consider the following:
    - How can we encourage more courage and bravery in a time when economic considerations prevail? How can we support a business case that supports energy reduction whilst simultaneously reducing household carrying costs?

- How can we lever various strategies and have a deeper dive into incentives versus sticks? How can local governments find behavioral, business, and household incentives?
- Public consultation still talks about solar and wind power. Are there alternative solutions that FortisBC can look at to address public perception as a means to allow for this energy diversification shift?
- Need to cost out the pathways with respect to climate change and adaptation (e.g. windstorms, flooding, wildfires). How are these risks being assessed to the paths that we are choosing?
- Are there are any opportunities to move early with smaller communities like Revelstoke to demonstrate that the Diversified Pathway is viable? Interesting to demonstrate proof of concept to garner a level of confidence in the plan.
- We are in a transformation and not a transition period. Enormity of the budgets necessary to make these changes. How are we going to pull out a $100 billion to make this transformation happen? Need working teams (residential, commercial, industrial groups) to understand how we can make this plan work?
- What are FortisBC leadership and staff doing to reduce their own GHG emissions/energy consumption? Can we make this a challenge (internal with external publications on the internal challenge results)?