

DATE/TIME	March 10, 2011 1:00 p.m. – 4:00 p.m.
LOCATION	BC Hydro, Dunsmuir, 2nd Floor Auditorium 333 Dunsmuir, Vancouver, B.C.
TYPE OF MEETING	Subgroup meeting of the BC Hydro Integrated Resource Plan Technical Advisory Committee (TAC). TAC is a group of knowledgeable participants with significant interest, stake, and experience in BC Hydro’s resource planning process assembled to provide detailed, technical input and feedback to BC Hydro during the development of the IRP.
FACILITATOR	Anne Wilson, BC Hydro
PRESENTERS	Kathy Lee, BC Hydro John Rich, BC Hydro Basil Stumborg, BC Hydro
ATTENDEES	Bill Andrews, BC Sustainable Energy Association (TAC Member) David Craig, Commercial Energy Consumers (TAC Member) Matt Horne, Pembina Institute (TAC Member) Joe Mazza, FortisBC (TAC Alternate) Dave Pertulla, FortisBC (TAC Observer) Loch McJannett, Clean Energy BC (TAC Member) Randy Reimann, BC Hydro (TAC Member) Jim Weimar, Weimar Consulting Inc. (TAC Observer)
ATTENDEES BC HYDRO	Kathy Lee Patrice Rother Basil Stumbourg

PRE-READING MATERIAL / HANDOUTS / PRESENTATIONS
<ul style="list-style-type: none"> Agenda for TAC Subgroup Meeting - March 10

1. AGENDA REVIEW AND CONTEXT

Anne reviewed and confirmed the agenda with the subgroup. This meeting is a continuation of the input from TAC members on the scenario approach to the IRP analysis. Specifically, the meeting is to allow TAC members further input on potentially missing scenarios.

2. MARKET PRICE SCENARIOS

Basil provided an overview of the market price scenario development approach and recognized a need to modify BC Hydro's language to better describe the market price scenarios. BC Hydro objective was to develop forecasts for GHG price, natural gas price, and electricity price forecasts and with this IRP, a renewable energy credit price forecast that both tested the range of the variables, but also did so in an internally consistent manner. The planning team needed to think about how to include this added layer of complexity, to test a range of prices but not have an exhaustive list. The modellers needed to choose the more likely scenarios that tested the range and keep to a small number of scenarios to facilitate modelling capability. The question from TAC members is, "has BC Hydro picked the more likely scenarios, and what else may be missing?" A further question is that if some scenarios are missing, can changes be accommodated now, versus addressed later post analysis?

Further member comments on the market price scenarios

- Members reiterated that the five scenarios are not very easy to understand, for instance one member stated that they still couldn't tell us what scenario "C" is.
 - BC Hydro responded that it has been a struggle to describe the scenarios, and have looked at it a number of different ways such as putting a label on the scenario but labels are difficult to use without bringing in people's bias.
 - BC Hydro referred back to the 3X3 matrix of national / regional government action versus economic growth as being the best manner in which to understand the scenarios as they were chosen from that matrix.
- Members wondered what the risk was of not looking at some of the scenarios; and in particular characterized the options as highs and lows of the four price forecasts would lead to 16 different combinations. The combinations chosen to be examined by BC Hydro seemed a bit like guess work.
 - It was clarified that the starting point with these scenarios was the Black & Veatch study that looked at GHG price forecasts, and this study developed scenarios. From these scenarios, the gas and electricity and renewable energy credit (REC) price forecasts were brought in to develop a set of scenarios that linked the four forecasts together. It is really the first time of looking at how these four forecasts work together.
 - It was mentioned that for the initial Black & Veatch GHG study and scenario development, the GHG price forecast was an output, and with some of the initial forecasts were so extreme that they were not considered likely. Prices such as \$300 MWh.
- BC Hydro responded that planners are looking for a balance between picking scenarios that are likely or reasonable and can be modelled in a reason time versus ensuring a wide enough range that considers all potential outcomes. There are really an infinite number that could be chosen to examine.
- A member commented that really the question is, in simplification, there are 16 possible price combinations (of highs and lows), then how many has BC Hydro not looked at that are also plausible?
- It was suggested that one scenario mentioned at the last meeting (Feb 14) which may be plausible but was not assessed included the high growth and low natural gas price combination.
- Another price combination that was mentioned included a low growth and high government action; as the assumption may not be correct that low economic growth will lead to inaction on environmental policy.

- BC Hydro responded that there was some thinking through that scenario and the sense was that it would give an intermediate price result.
- BC Hydro mentioned that there may be some combinations that could be walked through with Black & Veatch who know the modelling to test some of the combinations that are not chosen.
- Members did not think that it was worth BC Hydro to go back and do further modelling or additional work with Black & Veatch.
- The price forecasts do not forecast cycles. For instance, strong economic growth is modelled as strong economic growth throughout the study period (20 years) where in reality the economy moves in cycles.
- One member mentioned that the description of these scenarios was so complex it would be difficult to have an informed discussion with government about them. The suggestion was made to simplify so as to structure the discussion in a way that could lead to a useful discussion.

ACTION

- Ask Black & Veatch to undertake a qualitative check/commentary of walking through some scenario factor combinations and comment on expected outcomes. Two example combinations include:
 - High growth, low natural gas prices
 - Low growth, high government action

Member comments on scenarios that may constitute ‘game changers’ (beyond the market price scenarios)

The discussion focussed on variables which may significantly impact the IRP but have not been addressed in the IRP or under the market price scenario approach. A number of examples were discussed, and are listed below.

Scenario where customers can directly access non-firm market power

- A member brought up the situation where customers may be able to access spot market power or purchase non-firm power directly from IPPs.
- Large customers, if paying tier 2 prices, may be willing to do that and take a reduction in reliability.
- This situation is within the parameters of the IRP, although there are policy considerations that would need to be worked through.
- It’s implication on planning are that it would reduce the gap, as this load would be using the non-firm surplus from the 4000 GWh non firm heritage ad 1000 potential GWh non-firm from IPPs.
- It was mentioned that under this situation, in the short term someone would need to pick up the cost (of customers buying cheaper power), but in the longer term there may be an efficiency gain.
- A member commented that this is a policy question that should be discussed with government and not an unrealistic scenario.
- This is a conceptual way of framing the issues regarding self sufficiency and insurance that may lead to economic efficiencies and should be included in a discussion with government.
- BC Hydro responded that this could be noted as a recommendation from a TAC member to government.

Action Item(s):

- BC Hydro to reflect on how to consider a scenario where customers may purchase market non firm energy.

3. TAC Discussions regarding B.C. Energy Policy Constraints

- A member commented that there are B.C. specific policies that are guiding where B.C. energy development is going and it is useful to highlight these policies and include them as part of the discussion.
 - BC Hydro responded that these were presented up front however, noted that more could be done to bring these policies back into the TAC discussions.

Action Item(s):

- BC Hydro to include a context piece in the draft IRP that describes the policies guiding the development of the IRP.
- One member commented that a big question is “Is there a need for Site C?” and, if the answer is yes and the government agrees, then that has a big impact on B.C. A direct question is, “If BC Hydro did not have self sufficiency and insurance requirements, how many years would the need for Site C be deferred?”
 - BC Hydro responded that it will not be testing government policy in the IRP.
 - BC Hydro also responded that the meeting notes and consultation record can note TAC members expressed a weakness in the IRP planning process about not being able to test the timing of Site C in the absence of the self sufficiency and insurance requirement.

4. TAC Discussions regarding Technology Scenarios

TAC members brought up a number of technology related scenarios that are currently not being considered in the IRP but which may, over time, significantly change energy planning. These are listed below:

Carbon Capture and Storage (CCS)

- Question about what happens if carbon capture and storage prices drop more quickly than anticipated.
 - BC Hydro clarified that in the 20 year analysis the supply options that are likely to be bid into acquisition processes are modelled, but in the longer term some of the other options including CCS and others such as tidal, wave, and geothermal are being considered.
 - BC Hydro also mentioned there are issues with CCS around liability and insurance of the CCS process that still need to be worked through.
- There were some questions regarding the cost assumptions of Coal with CCS and a check should be undertaken for consistency with cost and viability assumptions between the BC Hydro modelling and the Black & Veatch scenarios.

Action Item(s)

- Check coal with CCS consistency with Black & Veatch work and IRP modelling.
- Consider doing a sensitivity test with a modelling run where CCS costs are reduced.

Concentrated Solar Technology

- The increase in concentrated solar technology down south, close to California would substantially lower the export potential in B.C.

- A situation where concentrated solar picked up could mean that if B.C. started going through with a plan of export that assets would become stranded.
- One member thought that the issue of competition with export was an important discussion to have with Government.

Action Item(s):

- Check with the Black & Veatch work to see where solar technology and advancements come into play in the assessment.

Battery Technology on Electric Vehicles

- A substantial increase in range would put a whole new picture on the uptake of electric vehicles in B.C.
- Currently, there is minimal uptake in the first 10 years, but then the ramp up afterwards is fairly rapid going up to 25%. At this point would need about ½ of the automotive industry in B.C. to be electrically run - a member thought this would not likely happen in this way and the magnitude of the change is off.
- One member was not clear on the information regarding the electric vehicle assumptions and wanted to look at the load forecast.

Ocean Renewables

- Currently have not assumed that it is in a lower price, the model does not assume a decrease in price over time.
- Wave and tidal could become big players if cost decreases over time and this may play a role in terms of 30 year cluster analysis which could in time affect transmission planning.

Action Item(s):

- Consider looking price sensitivity assessment with ocean renewables.

Pumped Storage

- Using pumped storage would change the capacity picture in the IRP.

Flexibility and Keeping Options Open

- Members commented that when thinking about price, two key variables are uncertainties with supply side costs (see points above), and variability with B.C. exports.
- Member commented that BC Hydro should keep options open by spending small dollars instead of spending large dollars.
- BC Hydro responded in agreement that BC Hydro needs to minimize costs and keep options open without spending prematurely.
- Members commented that BC Hydro should be keeping multiple options open and perhaps spread the small dollars around.

5. Member Comments on Regional Planning Issues

- A member commented that there are key components of the regional system that have large impacts on the integrated system and associated planning.
- The example used was the Cheekeye-Dunsmuir transmission line linking the mainland to Vancouver Island which will need replacing within the plan timeframe. The member commented that there may be upwards of \$3B in benefit of avoiding replacing this line by using other options on the island such as widespread distributed generation.

- A question for the IRP may be how does BC Hydro avoid the next cable to Vancouver Island?
- A member commented that for the IRP economics, the Transmission planning is truncated, and doesn't include the longer term T plan. The IRP doesn't contemplate the replacement of the Cheekeye-Dunsmuir line and as a significant project, what are the other options?
- A member stated that BC Hydro already looking at the NE as an expansion and this (i.e., to the island) is similar.
- There was further discussion that if distributed generation picked up on the island, it would increase the thermal role; however, perhaps within the current policy it may be prudent to focus the flexibility in the role of gas onto Vancouver Island.
- The member commented this would be creating solutions to specific strategic issues.
- It was confirmed at this point the IRP has not gotten to the level of taking replacements of large T (such as the one to VI) into account.
- The question for the IRP may be are there key considerations of Transmission planning? There is strategic value of having a regional lens when looking at these issues.

Action Item(s):

- BC Hydro will consider this input on regional issues.

6. Member Comments on Overall Supply Planning and Acquisitions

- A member wanted to discuss supply planning and the acquisition process.
- BC Hydro mentioned that Jim Scouras will attend the April 27 and 28 meeting to discuss the acquisition process with the TAC.
- This topic was deferred until the April 27 and 28 meeting.

7. Member Comments on DSM Planning

- One member commented that with increasing conservation technology, there are various scenarios about how it may evolve.
- When asked, this TAC member felt that the conservation potential review (CPR) was out of date, and even the existing planning is picking up things that weren't contemplated.
- At a minimum correcting option 5 is a good step.
- The flip side is the forecast and the idea of natural conservation.
- A member wanted to bring in the possibility of new options appearing over time.
- A member suggested the idea of looking at the past CPRs and see how the achievable potential has changed over time (i.e. from past reviews).
- On the load side, manufactures are solving efficiency problems over time and there is a need to add these load savings.
- There was a question about additional uses of electricity and how much this may play into future load. The general trend has tried to have been captured.

Action Item(s):

- BC Hydro to consider any changes to how DSM planning is currently being addressed in the IRP.

8. Member Comments on the Columbia River Treaty and the IRP

- Currently, there is a renegotiation underway of the Columbia River treaty.

- A member asked how the IRP was going to consider this?
- There are some significant items that might be worth looking at.
- In a related discussion there was a question about MICA pumped storage, and BC Hydro is currently looking into pumped storage at MICA as an option.

9. Member Comments on the Range of IRP Costs

- A member brought up a concern around the possible range of costs, and associated factors, that should be brought forward as discussion with government.
- One example included the potential additional First Nations consultation and accommodation costs and related uncertainties with the rate impact.
- BC Hydro responded that there would not be a specific estimated cost put on FN accommodation.
- It was mentioned that the main point would be to highlight significant cost uncertainties (and so related associated rate impacts) and bring forward to government for discussion.

Action Item(s):

- BC Hydro to consider this input.

10. Update of Reports Outstanding

It was confirmed that TAC is still waiting to see the following:

- load forecast report
- updated site c costs
- GHG report (Black & Veatch)
- export assessment (Black & Veatch)
- Renewable Energy Credit report (Black & Veatch)
- electrification sensitivities (E3 report)

11. Closure

Anne thanked everyone for attending, and the meeting ended at 4:10 p.m.