BC hydro	NOTES
Wind Data Study **Presentation and Discussion**	July 3, 2008 10:00 a.m. – 2:00 p.m. Westin Grand Hotel Vancouver, B.C.

1. Presentation

The presentation is available on the BC Hydro website at:

http://www.bchydro.com/environment/greenpower/greenpower1754.html

2. Summary of Questions and Comments

The summary of questions (Q) and answers (A) are divided by presentation section.

Introduction and Context – Randy Reimann, Bruce Henry

Q. What is the wind penetration level that BC Hydro is targeting?

A. The wind penetration level will be determined through competitive acquisition processes and award contracts accordingly.

Q. What is happening with the wind monitoring sites that BC Hydro operated a number of years ago and is BC Hydro planning on undertaking more wind monitoring?

A. BC Hydro stopped wind monitoring when it became clear in the 2002 Energy Plan that it would not be developing wind resources but acquiring them. It is unlikely BC Hydro would again monitor wind sites, but rather would rely upon project developers for additional wind data.

Expertise and Experience of Study Team Consultants – Kevin Smith

No questions.

Data Collection and Quality Control – Kevin Smith

Q. Does BC Hydro have any plans to install new towers within the scope of this project?

A. No, this project is primarily a computer modelling exercise. We are looking to the IPP community to help us with actual wind data.

Q. How many data sets do you have so far, aside from the BC Hydro met data?

A. At this point, we do not have any. We do have some IPP provided data sets but cannot use them in this project due to confidentiality agreements.

Q. Is the wind data not of limited value if it is not used to correct modelled output? Or is the purpose to give some comfort level of the uncertainty in the modelling results?

A. We are using the model to represent all the regions of interest, and fitting the model to specific data points would provide a false sense of accuracy. Also, the modelling covers a 10-year period,

and there are no IPP wind observations available that go back 10 years. We are using the actual wind data to validate the wind modelling results.

Q. If there are sites where local effects are important, will the modelling be able to capture them.

A. The model is able to capture thermal flows. However, we won't know how good the model does if we don't have data.

Site Screening and Characterization – Kevin Smith, Ron Nierenberg

Q. How did you come up with the 30 MW limit?

A. We are trying to represent an ambitious wind resource scenario, and therefore did not want to exclude small areas. The focus, however, will be on the larger sites.

Q. One would be hard pressed to find an economic site that is under 80 MW and competitive in an RFP.

A. Using 30 MW as the lower limit for a wind project is primarily an artefact of the grid resolution – 30 MW will fit on a 2 x 2 km grid, which is the finest grid resolution used in the model. However, an individual project may be a collection of grid areas.

Q. Is the grid rectangular or square?

A. Square.

A. Clarification that the 30 MW has nothing to do with the Call for Tender process.

Q. Will there be a weighting scheme given for how sensitive areas are (e.g. caribou zones)?

A. We will work with you a bit more to get some detail. There may be some feedback on acceptability levels of different areas. That information would be helpful from you.

Q. Will you look at AC or DC lines?

A. The approach is to assume AC with medium voltage connecting through a substation.

Q. Will any results be publically available?

A. The report will be publically available, but it will contain aggregate data only.

Q. If the BCUC requested IPP wind data that was provided to BC Hydro in confidence, could the information be made public through regulatory processes?

A. BC Hydro can indicate to the BCUC that the IPP wind data is commercially sensitive and would have the ability to provide the information to the BCUC in such a manner that it would not be made public due to the commercial sensitivity.

Q. If someone submits a Freedom of Information request, what happens?

A. BC Hydro is not required to release this information if it is commercially sensitive.

Data Derivation/Wind Generation Forecast Simulation – Pascal Storck

Q. Has anyone looked at higher resolution than 10 minutes?

A. It is not worthwhile to go finer than 10 minutes, since there is almost no correlation of wind data at higher temporal resolutions.

Q. In our modelling, we used 1-km grid resolution and found significant differences. Why not go down to a grid resolution of 1km?

A. It is purely economic. A grid resolution of 2 km is adequate to capture the rough characterizations of the wind regime. This is, however, another reason why the model validation

will be very important. If there are significant differences, we can make adjustments based on validation results.

Q. In our modelling, we found a 35% difference in model results between the 2-km and the 1-km grid resolution runs. This can add up to an uncertainty of about 60%.

A. We are not trying to model or predict the correct wind speed in terms of magnitude at a particular location. Instead, we are trying to capture how the wind varies in time in relation to other areas and regions. The model can capture this quite well at a grid resolution of 2-km.

Q. I thought the re-analysis data set encompassed all different kinds of observations. I do not understand what it means that it has a 200 km grid resolution

A. The re-analysis data set is based on all kinds of different observations around the world, such as satellite images, ship and buoy data, weather balloons, etc. These observational data sets are ingested into a global computer model that has a grid resolution of 200 by 200 km. The output of this model is the re-analysis data set.

Q. Does the model assume neutral stability?

A. No. The stability is allowed to change.

Q. What mesoscale model is used?

A. The mesoscale model is WRF (version 3.0). There is a lot of information regarding this model available on the internet, scientific journal articles, etc.

Q. Do you want to predict patterns of wind change in BC? Do you look at patterns?

A. We are looking at historic seasonality and long-term trends. We are not trying to predict how the wind regime may change in the future. The modelling will simply provide a representation of the wind regime in the past at the chosen locations.

Q. Would we be able to get the long-term estimates for our site?

A. The original intent was to provide only aggregate results to the public. However, we could consider giving data back to individual proponents.

Characterization of Wind Resources in Regions/Characterization of Wind, Load and Hydro Generation – Magdalena Rucker

Q. What is the assumed wind speed when turbines cut out?

A. We are assuming 25 m/s.

General Questions, Discussion and Next Steps

BC Hydro offer/comment: In exchange for wind data collected by IPPs, BC Hydro will provide all the modelling data (10 years of 10-minute data, 30 years of monthly data, and the forecasting data) at those monitoring sites back to the IPP. Since the aim is to include monitoring sites that are evenly distributed over the various regions of interest, and there is an upper limit as to how many towers can be included, BC Hydro reserves the right to select which towers are included in the evaluation process. The selection process will depend on the number of monitoring sites offered by the IPP community, the location of the monitoring sites, and the period for which the monitoring site was active. BC Hydro will provide modelling data only for those sites that are selected for the evaluation process.

Q. When would we get the data?

A. The data can be supplied whenever the modelling portion of the study is completed (likely September).

Q. You are talking about the 10 years of historical data. What about the forecasting data?

A. The forecasting data set can be considered as a degraded version of the 10-year historical data set. It is not a projection of the wind resource into the future, and it would likely not be of any value to you.

Q. How does the study add value to the wind proponents?

A. BC Hydro is working to understand the wind resource, what the resource characteristics are and how it can be integrated in the system. It will help us understand how to operate our system to maximize the benefit of adding wind to the system.

Q. Are the results related to the call for power?

A. No.

Q. Looking at integrating wind resources in different areas, it seems that some areas have more met towers than others. How does that affect the modelling?

A. It does not affect the modelling per se since the data is not used in the initialization of the model nor is the model nudged to these observations. There will just be more uncertainty in the model output in those regions that do not have met towers, and it will be harder to gauge the accuracy of the model.

Q. Does the modelling allow for climate change?

A. No, it doesn't.

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