

Summary

Wind Energy Workshop- March 18, 2013

The purpose of the wind workshop was as follows:

- 1) To involve Yukoners in Yukon Energy's resource planning
- 2) To help all of us better understand wind's strengths and weaknesses as an energy source
- 3) To examine how wind stacks up to the four planning criteria set by participants of our energy charrette held in March 2011
- 4) To examine how to better integrate wind as a resource into our existing energy portfolio
- 5) To discuss strategies to optimize the socio-economic, environmental and cultural benefits of wind.
- 6) The day was broken into two parts: an afternoon session for stakeholders who had pre-registered, and an evening session for members of the public.

We began the day with some brief opening remarks from Yukon Energy president David Morrison, followed by presentations from three of our experts: John Maissan and JP Pinard from Yukon, and Sonny Banjac from Sea Breeze Power in Vancouver. John Maissan outlined the technical challenges to operating wind turbines; JP Pinard talked about the existing wind energy work taking place in the territory and talked about the importance of reducing our dependence on fossil fuels; Sonny Banjac presented a 10-step process for setting up a wind farm.

After their presentations, the audience had an opportunity to ask questions.

Q. Where would you see the critical mass for wind power, when we reach a tipping point and wind is economically affordable?

Where is the energy subsidy for renewable resource energy? Natural gas is cheap because of subsidies.

A. JP: Have to determine the size of wind project first.

JM: As large as the grid can absorb. Stay below the threshold initially; can't presently compete with the cost of LNG.

Q. Is there a model for an individual home or does wind have to be industrial sized?

A. JP: Re. living off grid...most people live in non windy areas which are at lower levels than the minimum to develop commercial wind projects. Therefore, for the individual, it would be a high cost for wind. Compare wind to solar and solar is cheaper and consistent.

Sonny: There has been a size increase in commercial turbines which has allowed a lower cost with a higher output. More production has allowed for a decrease in cost.

Q. Why hasn't wind grown here over the last several years? There was a wind conference in Whitehorse in 2003. We were leaders; what happened?

A. JP: I don't know. Perhaps a change in Government or policies; Energy Solutions Centre has tried to continue. The Federal government has reduced subsidies.

- Q. Currently there are only two wind turbines. Are there wind monitoring stations throughout the Yukon? Yukon Energy should collaborate with Northwestel to put monitoring stations on NWTel communication sites.
- A. JM: Pressure gradients vary throughout different areas and not a lot of areas have infrastructure but perhaps using power from the North WestTel towers could be viable as roads are already in place. (Northwestel is agreeable to that idea)
Electrical loads don't currently promote two or three different wind farms. Only one wind farm would be installed for the time being, due to cost and load factors.

Next came presentations from Cam Osler from Integroup Consultants on the economics of wind energy, Nicholas Heap from CanWEA on the socio- economic impacts, and Travis Ritchie of Yukon Energy on the environmental considerations in wind energy development. Questions from the audience followed.

- Q. What kind of studies are being done about bird migration on Ferry Hill?
- A. TR: No field studies are being done there right now. For now we are in the pre-feasibility stage of study and Yukon Energy has not yet made a decision on Tehcho (Ferry Hill) or Mt. Sumanik. Any decision to pursue a potential project on Tehcho would most certainly include environmental field studies as part of an overall assessment of potential project effects.
- Q. Please explain what you mean by saying wind is not a good solution to power the mining sector but is good for load growth.
- A. CO: Wind has to be long term with a good load. It is not good for five to ten year loads, which typically is the lifetime of a mine. This is true not just of wind but hydro too. Also, if we have successful energy conservation programs (DSM programs) in place it reduces the case for wind or hydro.
- Q. The message Yukon Energy seems to be sending is that renewable energy is not necessary. Why would wind power not at least be on the same level as hydro? You seem pro-LNG and anti-wind.
- A. CO: We are looking at wind and are working to bring a wind project to the shovel read stage. But as was mentioned earlier, the issue is the load factor...for wind you need long term load growth. A note that we didn't compare LNG to wind in our presentation; we compared it to diesel.
- Q. What did you use for discount rate vs. inflation rate?
- A. CO: 6.6 percent and 2 percent
- Q. With regard to probable future carbon taxes in North America, how would it change if there is a high carbon tax?
- A. CO: The economics would change, making renewable options will all look better. But capital must be acquired for the renewable options. Carbon tax is a long way from being a driving factor.

After the presentations, people were free to roam around the room and visit various tables that posed questions about wind. They were encouraged to add their comments on a flip chart.

Reliability of wind:

- It can be reliable when paired with other renewables like hydro
- Don't use energy conservation (DSM) as an excuse not to move forward with wind
- Take wind more seriously
- Recognize that heat is a load in future; use wind energy to heat homes
- Short term mine load can be transferred to heat & transportation (electric vehicles) in long term
- Need to have wind generation at various places on grid (different wind regimes)
- Windy in winter when need it the most
- Develop transmission to move wind energy where it's needed
- Use electric cars as power source (distributed storage)
- Gives consumers a chance to be part of solutions
- Unique place needs unique solution
- Install smaller wind farms throughout the Yukon
- Time of day rates, incentive load spread
- Need an engaged public to be part of solution
- Ex. Juneau-utility has ability to shut off water heaters during certain times of day
- System that mimics nature
- New technologies-liquid batteries that store energy; good solution to storing wind energy
- Wind & hydro work well together (solar too)

How to integrate wind energy into the existing energy portfolio:

- Set goals that reflect public opinion
- Look at storage options
- Integration of other technologies
- Simply: BUILD WIND
- Learn from existing wind technology
- Why aren't we maintaining existing wind turbines?
- Broken turbines? Increase communication about what's happening?
- Privatize?
- What efforts can reduce maintenance costs? Prioritize in planning
- De-prioritize fossil fuels: energy security; ethical arguments (future for our youth)
- Integrate with heating needs
- Set carbon offset goals
- Engage government; engage citizens in goal setting (maybe independent of government)
- Projection of fuel switch to electricity/wood for heat; transportation
- Time of use rates / long term smart meters
- Learn from Haeckel Hill turbines
- Have someone solely dedicated to wind on staff

- Some people will pay a higher price for wind power
- Smarten up / strengthen the grid

Strategies for moving forward:

- Lasting after constructions – road/snow removal
- Hangover effect after construction therefore a need for education
- Invest/develop programs at the College
- Tours to promote wind energy
- Ski trails on Sumanik
- Why does Yukon Energy have Travis Ritchie do a presentation about environmental impacts of wind but not at the LNG workshop?
- Forget the unknown Ferry Hill; develop Sumanik
- Energy efficiency projects will generate a lot more jobs in the Yukon than wind turbines
- Why does Cam Osler not recognize home heating and transportation as a load? Mines appear to be the only load he considers valid

Strengths and weaknesses of wind with regard to environmental responsibility:

- Stop obstructing wind development
- Should just do it
- Birds- don't assume that they are not a problem
- Road access-issue so restrict access
- Concept of MW
- All strengths, no limitations; just do it
- Promote energy efficiency so no need to build new turbines
- Bird migration routes; do the work
- Road access therefore increased hunting gates
- Birds: species specific; very site specific; studies needed
- Clearly, Yukon Energy does not understand and is not interested in wind. So, stop obstructing wind's development and put out an RFP to allow a 10.5+ MW wind farm
- Ski trails up at Sumanik site

Strengths and weaknesses of wind with regard to flexibility:

- Load-space heating & storage
- On/off = more flexible?
- Wind is double penalized
- Smaller turbines in different locations
- More small wind farms in different locations-capture wind at all times
- Firm load=space heating (not only mines- boom and bust)
- ETS (Electrical Thermal storage) to store electrical heat energy for space heating
- Different turbine options
- Wind IS flexible; can be limited or shut down
- Options to sell/transport the energy

Strengths and weaknesses of wind with regard to affordability:

- Models conservative therefore limit the risk
- Need a model for Independent Power Producers (IPPs) therefore an RFP for ~10MW and choose a project
- Show wind next to new hydro instead of short term; build a demand then it could be more affordable (ex. electric vehicles)
- Energy storage – examine different types
- Wind is plentiful and FREE and follows the electrical & heat load
- In five years, 30 gWh of energy can easily be saved through energy efficiency
- Build wind, customers (firm load) will come: space heating & transportation
- We need to develop policies and procedures in place to sell electricity from an IPP, need a linear & transport system to develop.
- Complete appropriate economic analysis on alternatives involving wind (to determine wind's strengths & limitations)
- Investigate use of energy storage systems including: electric thermal storage, battery systems, wind/solar hybrid electric thermal storage
- Integrated systems including electric vehicles
- It was wrong to show wind as an option for short term loads. It should only be compared to new hydro
- Why all this fear mongering on the cost of wind energy and NO similar discussion on any new hydro project? They serve and need the same loads.

Hector Campbell, Yukon Energy's Director of Resource Planning and Regulatory Affairs, summed up the afternoon session by noting the following:

- Clearly a strong support for wind
- Constraints: questions we must ask to make sure it is an affordable supply include:
 - Transmission constraint
 - Resource constraint
 - Grid constraint
- Renewable power is free – maintenance costs 2-3 cents. Building it is relatively expensive.
- Concepts to explore – utilizing wind in a form that will move into storage/heat & transportation (electric vehicles) – with that comes some risk
- Tehcho (Ferry Hill) already has an access road
- Environmental impacts with all projects
- Regulatory aspects will all projects
- Advanced technologies for wind therefore risk reduction
- Now solutions to manage rime icing so it is not as risky as before

Before the afternoon session ended, Chief of the Kluane first Nation, Mathieya Alatini, spoke:

- They are taking a unique approach in their community (KFN)
- Decisions must entail long term impact on energy production. Can we afford not to change the dynamic of energy production?
- Global warming – environmental awareness therefore a shift in policy & legislation is needed; how do we move forward and decrease our carbon footprint?

During the evening session, the six energy experts gave abbreviated versions of their afternoon presentations, followed by questions from the public:

Q. What is the grid capacity? Could it take eight MW of wind on the system? Who would pay for upgrading the grid?

A. JM: Where we have the higher voltage lines – not a problem at this time.
Wind farm would be built near the load.
The grid connection would be paid for as part of the project

Q. Is there a difference between shiny and matte black plates for improved passive heating against rime ice?

A. JM: Don't have a view, but need paint that allows the ice to come off easily. Black is best be it matte or shiny.

Q. Is there a certain time of year when rime icing occurs?

A. JM: The onset of winter-here mid Oct-Mid Jan (moist air) As more sun shines, less ice rime.

Q. What are you doing in Burwash Landing to address the icing issue?

A. JP: Not concerned about icing as the location is in the valley as opposed to a mountain top where rime icing occurs.

Q. What about getting the mines to build the wind sites. Would we then be able to use the wind turbines after the mine is done? What happens i.e., placement of turbines at the mine and what would happen after the mine is gone.

A. Could move the wind turbines to another location.

Q. The Scott Station at Antarctica is almost total wind energy and no issues there.

A. JM: Strong winds there and no rime issues and persistent cold temperatures

Q. Why not recognize home heating and transportation i.e., get into the home heating business?

A. CO: Electric vehicles are talked about but will take time to develop. (~30 yrs out) We are trying to cut back on load – energy conservation. A cost effective, renewable resource is key so rates don't sky rocket. Justification of investments and long term planning is necessary. (20-40 yr plan)

Q. Cam Osler, you have said that wind is unpredictable. Are you saying that Yukon Energy is only left with using fossil fuels?

- A. CO: Resource plan supports using renewable resources; hydro and wind will happen but it will take time.
- Q. Has Yukon Energy looked at solar and geothermal to balance with wind? Has Yukon Energy looked at incentives to mines to develop their operational plan?
- A. CO: Solar and geothermal were looked at but didn't make the shortlist in the resource plan at this time. Still something Yukon Energy has on the table.