Canada’s Opportunity for Wind Energy in Northern and Remote Communities

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• **About CanWEA**
  – CanWEA has more than 420 members, most of whom are focused on large wind
  – Small wind Committee guides activities on wind < 300 kW
  – Now hiring a full-time “Small Wind Advocate” sponsored by leading small wind companies

• **How we see small wind:**
  – Tremendous interest in small wind from the general public
  – Market is now where large wind was 20 years ago, so there is an opportunity to “not miss the boat”
  – Small wind and large wind are linked
Wind Energy in Canada (2008)

- Capacity end 2008: 2,372 MW
  - Electricity for over 600,000 homes
  - 1% of Canada’s total demand
- Tremendous growth
  - 137 MW in 2000; 30% annual growth

Wind: Canada’s infinite source of clean energy.
CanWEA’s WindVision 2025

• 20% of Canada’s electricity demand to be met by wind energy by 2025

• Opportunity:
  – Canada has a massive high quality wind resource, a large hydroelectric base, green energy export potential and a solid industrial manufacturing base

• Impacts:
  – 55,000 MW of installed wind capacity covering only 1/5000th of Canada’s land mass
  – Minimum $79 billion investment in Canada
  – Creates minimum 52,000 new jobs
  – Reduces GHG emissions by 17 Mt CO₂ annually

Wind: Canada’s infinite source of clean energy.
What About Northern and Remote?

• Demand is there:
  – 300 northern and remote communities; 200,000 people

• Electricity is expensive and has negative impacts:
  – Communities paying up to $1.50 per kWh (often subsidised)
  – Significant air pollution, ground spills, limited local benefits

• Technologies are there:
  – Experience in Alaska & Ramea demonstrate readiness of wind and wind-diesel hybrids

• Expertise is there:
  – Canada has the experts, the technology and the institutions (e.g. WEICan) needed to make this a reality

• Everything appears to be ready to fly ...

Wind: Canada’s infinite source of clean energy.
So ... What is Stopping Us?

• Very hard to displace an incumbent technology
  – Diesel gensets are familiar ... and the investments have already been made
  – Utilities only interested in paying avoided cost of diesel

• Have not been able to get “critical mass”
  – Most projects have been for demonstration purposes
  – Not enough emphasis on capacity building

• No recognition for wind’s benefits
  – 1 cent/kWh incentive for large wind introduced in 2001 was the catalyst that Canada needed to develop big wind
  – ... but that incentive was not enough to bridge the gap in northern and remote communities

• So, what do we need?

Wind: Canada’s infinite source of clean energy.
Remote Community Wind Incentive Program (ReCWIP)

• **Collaborative development:**
  – Led by CanWEA in consultation with communities, NRCan, INAC, utilities, provincial/territorial governments
  – Now a part of CanWEA’s main budget “ask” to the federal government (extension of ecoEnergy Program to 2014)

• **Incentive that recognises characteristics of northern and remote communities:**
  – Higher cost than southern projects
  – Lower capacity factors
  – Design influenced by many other “lessons learned” ...
ReCWIP Design

- Recognises that mix of production incentive and capital grant is needed:
  - A production incentive to ensure long-term operation, and;
  - Up-front capital to overcome initial high costs

- Recognises that there are (at least) two different types of communities:
  - Large communities and mines with medium energy costs
  - Small, remote communities with extremely high energy costs

- Recognises that we need to build critical mass:
  - Program first targets leader communities (“hubs”) to build capacity and gain early successes
  - Program then spreads to other surrounding communities (“spokes”)
ReCWIP Design (cont.)

• The incentive:
  – Scaled to provide incentive equivalent to ecoEnergy (representing roughly 15% of generation costs)
  – For large northern communities and industrial facilities (mines):
    • 3 cents per kWh production incentive for 10 years (with 1/3 paid as up-front capital grant)
  – For small remote communities:
    • 15 cents per kWh production incentive for ten years (with 1/3 paid as up-front capital grant)

• Phased approach:
  – Implement over three years in 9 “hub” communities, then:
  – Implement projects in 25 “spoke” communities
Costs and Impacts

• Total cost of $61 million over 18 years

• Direct Impacts:
  – 34 new wind energy projects (55 MW of capacity)
  – $300 million dollars in total diesel fuel savings
  – 10% (128 MWh) of electricity demand met by wind energy
  – 77 kilotonnes of CO2 emission reductions per year, equivalent to taking more than 12,600 cars off the road;

• Indirect impacts:
  – Foster the development of Canadian wind turbine technology and expertise in wind-diesel applications
  – Assist remote communities in diversifying their energy supply and stabilizing electricity prices
  – Support goals of Arctic Sovereignty Strategy
Support for ReCWIP

- Communities, First Nations & Aboriginal Groups:
  - Inuvialuit Regional Corporation, Inuvik NT
  - Tuktoyaktuk Community Corporation, Tuktoyaktuk NT
  - Beaufort Delta Regional Council, NT
  - Town of Inuvik, Inuvik NT
  - City of Yellowknife, Yellowknife NT
  - Hamlet of Ulukhaktok, Ulukhaktok NT
  - Hamlet of Sachs Harbour, Sachs Harbour NT
  - Ta’an Kwäch’än Council, Whitehorse YK
  - Vuntut Gwitchin First Nation, Old Crow YK
  - Tr’ond”ek Hwëch’in Government, Dawson City YK
  - Ka:’yu:’k’t’h/Che:k:tes7et’h First Nations, Kyoquot BC
  - Dease River First Nation, Good Hope Lake BC
  - Centre for Indigenous Environmental Resources, Winnipeg MB
  - Keewaytinook Okimakanak Chiefs, Fort Severn ON
  - Village of Inukjuak, Inukjuak, Nunavik QC
Letters of Support for ReCWIP (cont.)

• **Governments and Utilities:**
  – Northwest Territories Power Corporation
  – Yukon Energy
  – Government of NorthWest Territories

• **NGOs:**
  – Ecology North, Yellowknife NT
  – Arctic Energy Alliance / City of Yellowknife, Yellowknife NT
  – David Suzuki Foundation, Vancouver BC
  – Yukon Conservation Society, Whitehorse YK
  – Pembina Institute, Edmonton AB
  – One Sky Institute for Sustainable Living, Smithers BC
Summary

• “Big wind” has a bright future in Canada
  – Many opportunities, but we’re playing “catch-up”

• Opportunity for northern & remote wind even greater
  – Canada has “perfect hand” of need, technology and expertise
  – Opportunity to access growing market in Canada and overseas

• Many challenges in getting at this opportunity
  – Dealing with an incumbent generator
  – Need to build momentum: “Go big or go home”

• ReCWIP is the catalyst:
  – Provides push that recognizes wind’s benefit
  – Relatively small amount ($61m) provides tremendous benefits

• Let’s do it!
Resources

• **CanWEA:**
  – “Assessing the Potential Uptake for a Remote Community Wind Incentive Program in Canada”, 2007
  – CanWEA Small Wind Committee, soon to be lead by our new “Small Wind Advocate”
  – Annual conference, September 20 – 23rd, Toronto Ontario

• **Research community:**
  – Wind Energy Institute of Canada (WEICan): testing leading to certification, R&D on wind and wind-diesel systems ([www.weican.ca](http://www.weican.ca))
  – Wind Energy Strategic Network (WESNet): research projects looking at wind-diesel, cold weather considerations ([www.wesnet.ca](http://www.wesnet.ca))
  – Natural Resources Canada