



# Canada's Opportunity for Wind Energy in Northern and Remote Communities

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Wind-Diesel Conference

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**canwea**

CANADIAN WIND  
ENERGY ASSOCIATION

ASSOCIATION CANADIENNE  
DE L'ÉNERGIE ÉOLIENNE

# CanWEA and Small Wind

- **About CanWEA**

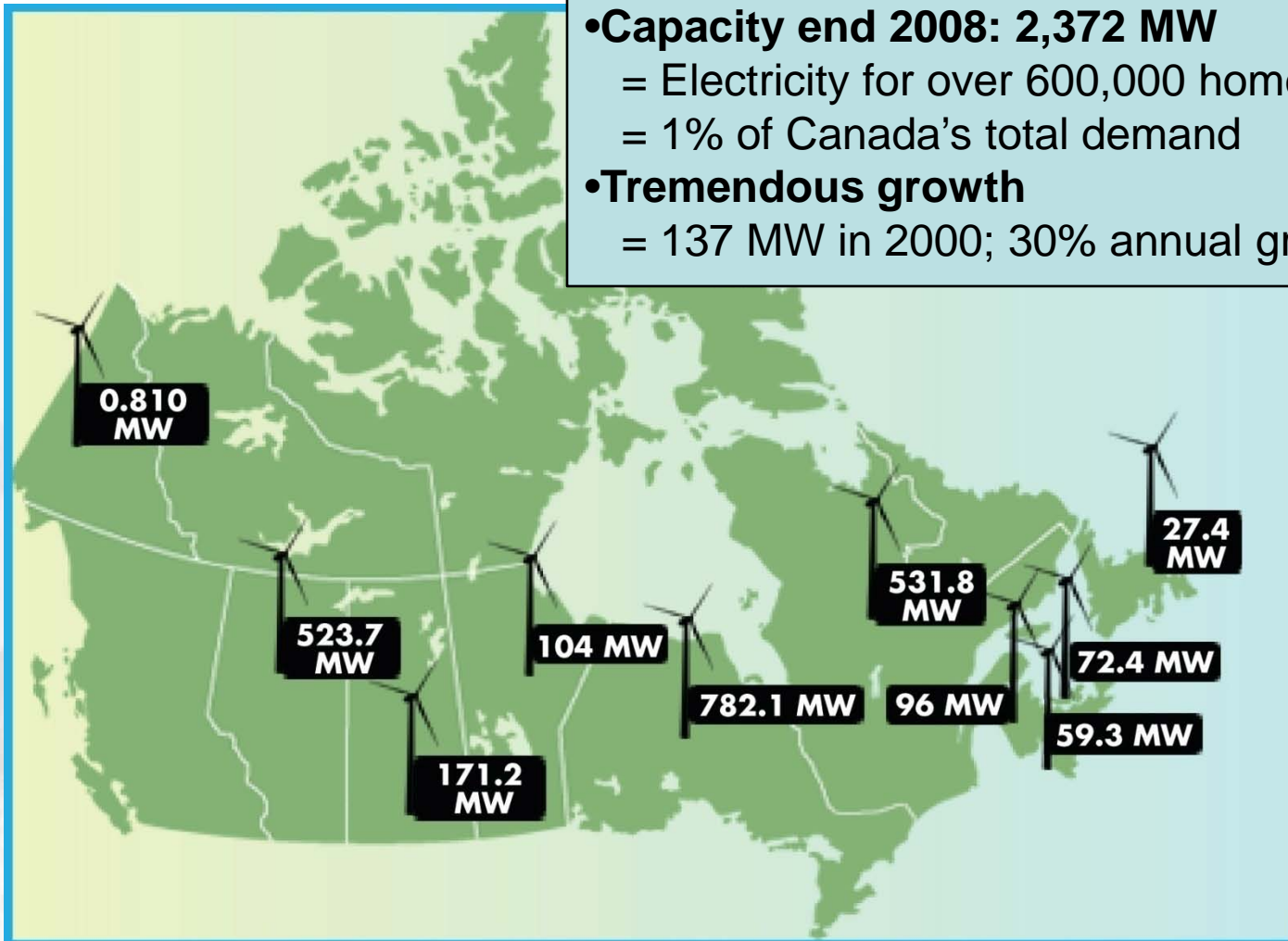
- CanWEA has more than 420 members, most of whom are focused on large wind
- Small wind Committee guides activities on wind < 300 kW
- Now hiring a full-time “Small Wind Advocate” sponsored by leading small wind companies

- **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.

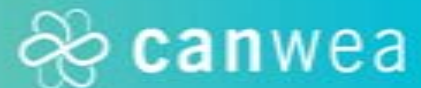
# CanWEA's WindVision 2025

- **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 1/5000<sup>th</sup> of Canada's land mass
  - Minimum \$79 billion investment in Canada
  - Creates minimum 52,000 new jobs
  - Reduces GHG emissions by 17 Mt CO<sub>2</sub> annually

WINDVISION 2025  
POWERING CANADA'S FUTURE



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 ...**



# 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?**

# 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:tles7et'h First Nations, Kyoquot BC
  - Dease River First Nation, Good Hope Lake BC
  - Centre for Indigenous Environmental Resources, Winnipeg MB
  - Keewaytinook Okimakanank 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 – 23<sup>rd</sup>, 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