



Rankin Inlet
Wind Turbine Production

Wind Energy Institute of Canada

2009 International Wind-Diesel Workshop

May 31 to June 2 2009

“WEICan will advance the development of wind energy across Canada through research, testing, training and collaboration”

- Research, Development and Demonstration
- Testing Leading to Certification
- Training, Consultation and Public Education
- Technical consultation and assistance

Visit www.weican.ca for more information

- Established and operational since, 1981
- WEICan 2006
- Canada's only national wind test institute
- Non-profit, funding Federal & Provincial
- 38-acre site can accommodate a number and variety of wind turbines for testing
- To date 26 turbines have been installed and tested at our facilities (VAWT and HAWT)



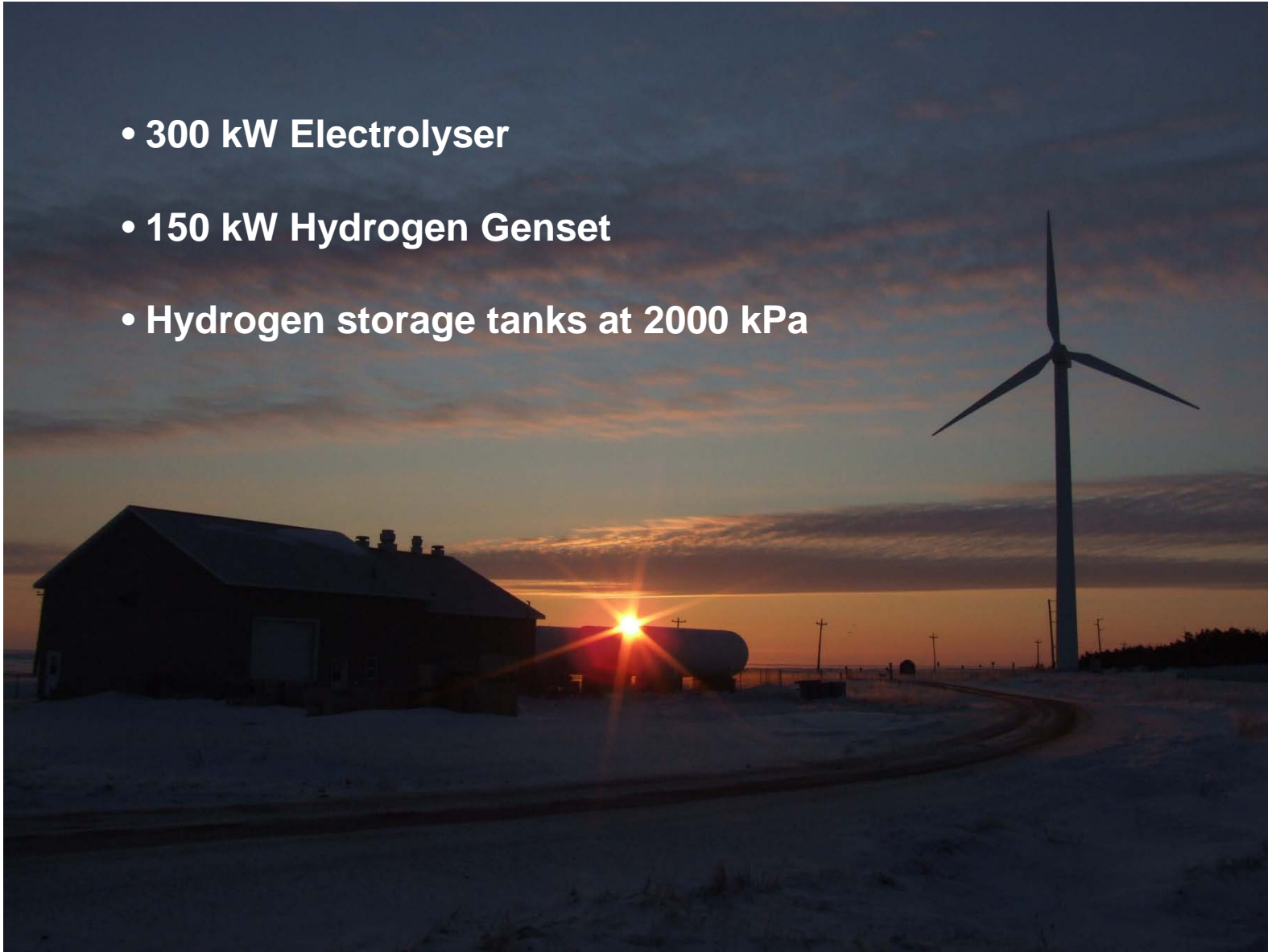
Tests for Type Certification

- Power Performance
 - 60 hours within wind speed range
 - Data using one minute average
- Power Quality (Optional)
- Acoustic, Sound Power (Optional)
- Load Measurement (Optional)
- Safety and Durability Testing (Small Wind)
 - 12 Months Operation (6 Month required – Winter)
 - 2500 hours power production
 - 250 hours and 25 hours high winds

Hydrogen Project

Wind Energy: Power for Canada

- 300 kW Electrolyser
- 150 kW Hydrogen Genset
- Hydrogen storage tanks at 2000 kPa



Wind-Diesel History

Wind Energy: Power for Canada

- 1985- 1994 Many Wind-Diesel studies/modeling/test
- 1994, Cambridge Bay, NWT: Installed wind and utility load monitoring equipment. Modeled the effect of varying levels of wind capacity would have on fuel consumption within the community
- 1995, Waskaganish, Quebec: Same as Cambridge Bay
- 1999, Siberia: Installed a control system on a demonstration project for Pacific Energy

Wind-Diesel History

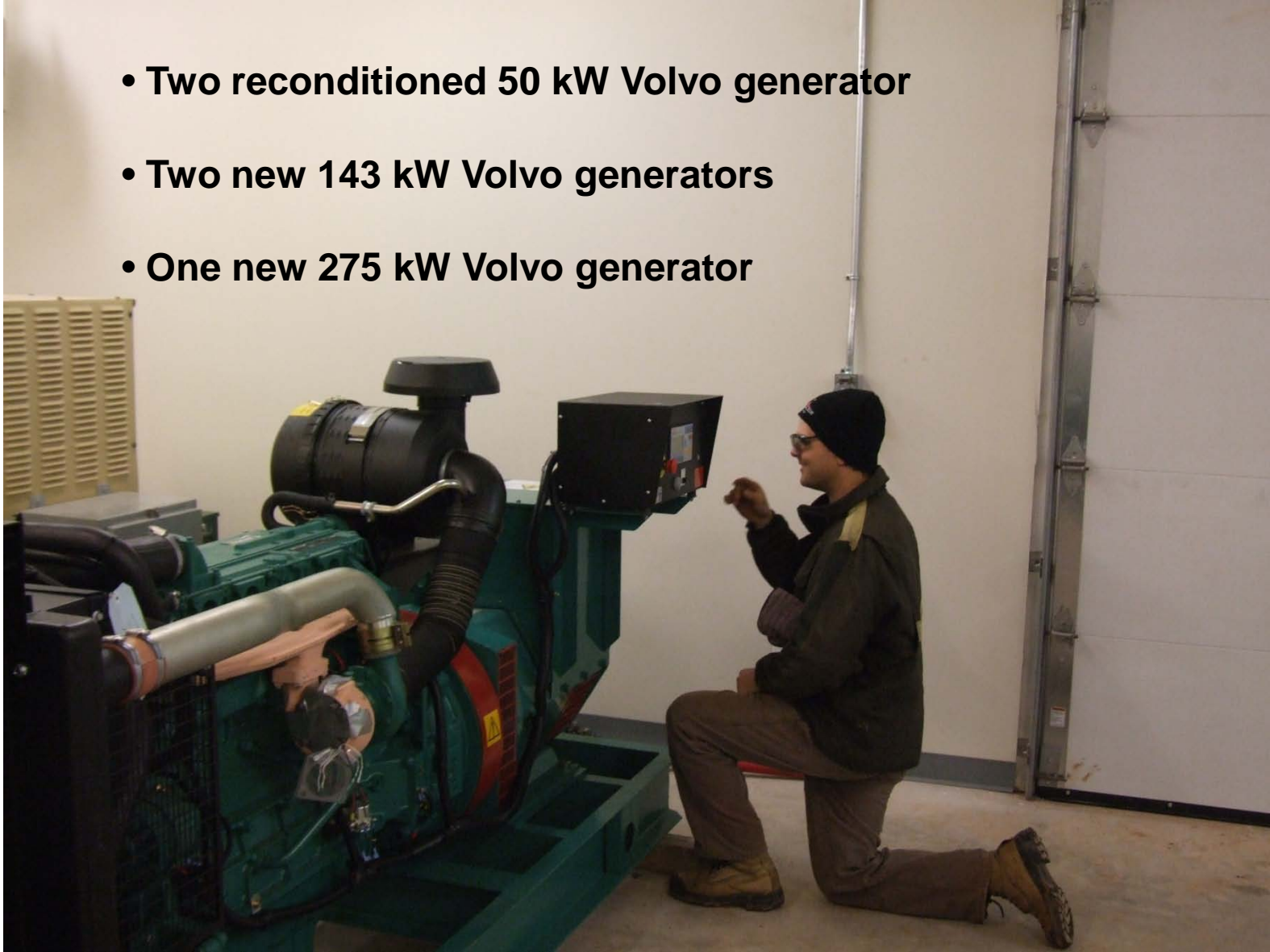
Wind Energy: Power for Canada

- 2002, Sagar Island, India: Installed our Wind Diesel Integrated Control System (WDICS) on a demonstration project for the West Bengal Renewable Energy Development Agency
- 2004, Ramea, Newfoundland: Collaborated with Frontier Power Systems to install 5 WindMatic 65kW units and the Wind Diesel Integrated Control System

Diesel equipment

Wind Energy: Power for Canada

- **Two reconditioned 50 kW Volvo generator**
- **Two new 143 kW Volvo generators**
- **One new 275 kW Volvo generator**



Project summary

- Diesel installation of 5 MW capacity
- Peak load 2.6 MW
- Population: 2500
- Low penetration (50 kW turbine)

Brief History

- Planning to install wind turbine to offset diesel requirements started in 1998
- Erected a single AOC 50 kW wind turbine in 2000
- November to December 2001 80,000 kWh was produced (36% availability)
- Minor problems would mean low availability
- Turbine repaired by AOC in October 2004 and training was provided as well as O&M schedule

WEICan Site visit

- October 2008 WEICan visited site
- Findings to help Atlantic IRAP's efforts in Nunavut
- Turbine confirmed to be in operational condition
- Entegrity Wind Systems performed maintenance and upgrading
- Turbine currently operating

Operating results

Month	kWh
October 2008	9506
November 2008	10144
December 2008	22756
January 2009	18846
February 2009	8091
Total	69,343

- Displacing 18,248 liters

Problems found

- The turbine was left inoperable because no personnel available to identify problems
- Only having one turbine does not justify having full-time qualified technical personnel
- The power company stated that support for wind power strongly depended on the current price of diesel fuel

What is missing for Analysis?

- Proper information
- Proper instrumentation (MET tower, data logger, etc)
- Monitoring

Wind in the North

- Past few years there has been lots of talk (Tuktoyaktuk in 2007, NWT RFP, ReCWIP concept, etc)
- WEICan's concerned with validity of data and reliability of infrastructure

What is missing?

- Desire
- Funding
- Leadership

Now what?

- Install a properly instrumented MET tower
- Install a 2nd turbine and maybe even a 3rd
- Have to data available online for all to see
(Mawson Research Station example:
<http://www.aad.gov.au/apps/operations/electrical.asp>)
- Have maintenance plan and contracts in place
- Training for local staff to do basic service and monitoring

To have a successful project

- Set clear and measurable goals
- Create short term and long term objectives
- Collaboration with experienced companies

Thank you/Merci

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