

Lessons from Wahgoshig First Nation

Community Energy Planning with Biomass



About Wahgoshig First Nation

- ▶ Received reserve land in 1986 - south shore of Lake Abitibi, 100 km from Timmins
- ▶ On-reserve population of 200 (approximate)
- ▶ 5 Impact Benefit Agreements with resource developers on traditional lands
- ▶ 24 Joint Venture partners
- ▶ Limited Partner of several corporations including Wahgoshig Resources LP and Wahgoshig Energy LP
- ▶ Financial Performance Certification from First Nation Financial Management Board
- ▶ Borrowing member of the First Nation Finance Authority

What is a Community Energy Plan?

- ▶ A guideline for community's future energy activities, based on community vision
- ▶ Detailed analysis of current energy consumption trends
- ▶ Recommends a long-term energy strategy to meet growing energy needs
- ▶ The critical success factor: community ownership of the plan
 - ▶ Intensive community consultation and collaboration

WFN Energy Profile

- ▶ Community uses 4.5 million kWh/year, mainly electricity at \$0.19/kWh plus delivery charges
- ▶ Energy consumption dominated by residential space heating loads from 55 houses
- ▶ Electric baseboard heaters supplemented by wood stove heating (78% of community burns wood)
- ▶ Small band houses are 25% less efficient than the Timmins average
- ▶ Electricity costs alone are \$349,000 annually

Energy Strategy

- ▶ 1. Lower cost of electricity
- ▶ 2. Find a more efficient way to heat homes
- ▶ 3. Keep the heat inside homes by improving housing standards and retrofitting existing houses to new standards
- ▶ Energy Plan outlined the strategy through 12 initiatives, each fully defined with desired outcomes, metrics to measure success, and potential funding sources

Prefeasibility Study

- ▶ Commissioned prefeasibility study to identify best alternative source of heat and electricity
- ▶ Analyzed various scenarios outlined in Energy Plan
- ▶ The study assumed:
 - ▶ a) All houses would be retrofitted to new energy conservation standards
 - ▶ b) Tier 4 status with community on a single meter with Hydro One to allow bulk purchasing and energy export

Scenarios

1. Solar and Wind Electricity with Wood Boiler	Electricity: 100 kW solar, 50 kW wind	Heat: 626 kW wood-chip hot water boiler system	Islanding: 8250 kW electrical storage
2. Solar Electricity with Wood Boiler	Electricity: 150 kW solar	Heat: 626 kW wood-chip hot water boiler system	Islanding: 8250 kW electrical storage
3. Wood Cogeneration for Electricity and Heat (best scenario)	Electricity: 110 kW output from wood cogenerator	Heat: 220 kW output from wood cogenerator	Islanding: the cogenerator can load follow the electrical demand
4. Solar Electricity, Heat Pumps, and Wood Boiler	Electricity: 150 kW solar	522 kW wood-chip hot water boiler	Islanding: 24600 kW electrical storage

Moving Forward

- ▶ High capital costs include \$2 million to install a district heating system; and \$40,000/house as well as \$250,000 per band building for high efficiency retrofits
- ▶ Total capital costs estimated at \$6.9 million
- ▶ Next step: to commission detailed feasibility study for wood cogenerator, district heating, and retrofits
- ▶ Explore financing options

