

Aroostook Band of Micmacs

Strategic Energy Planning Initiative

Presented by:

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Environmental Director

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Overview

- **About the Aroostook Band of Micmacs**
- **Project Background and Introduction**
- **Project Goals and Objectives**
- **Summary of Report**
- **Vision Statement**
- **Discussion on Vision and Plan**
- **Next Steps**

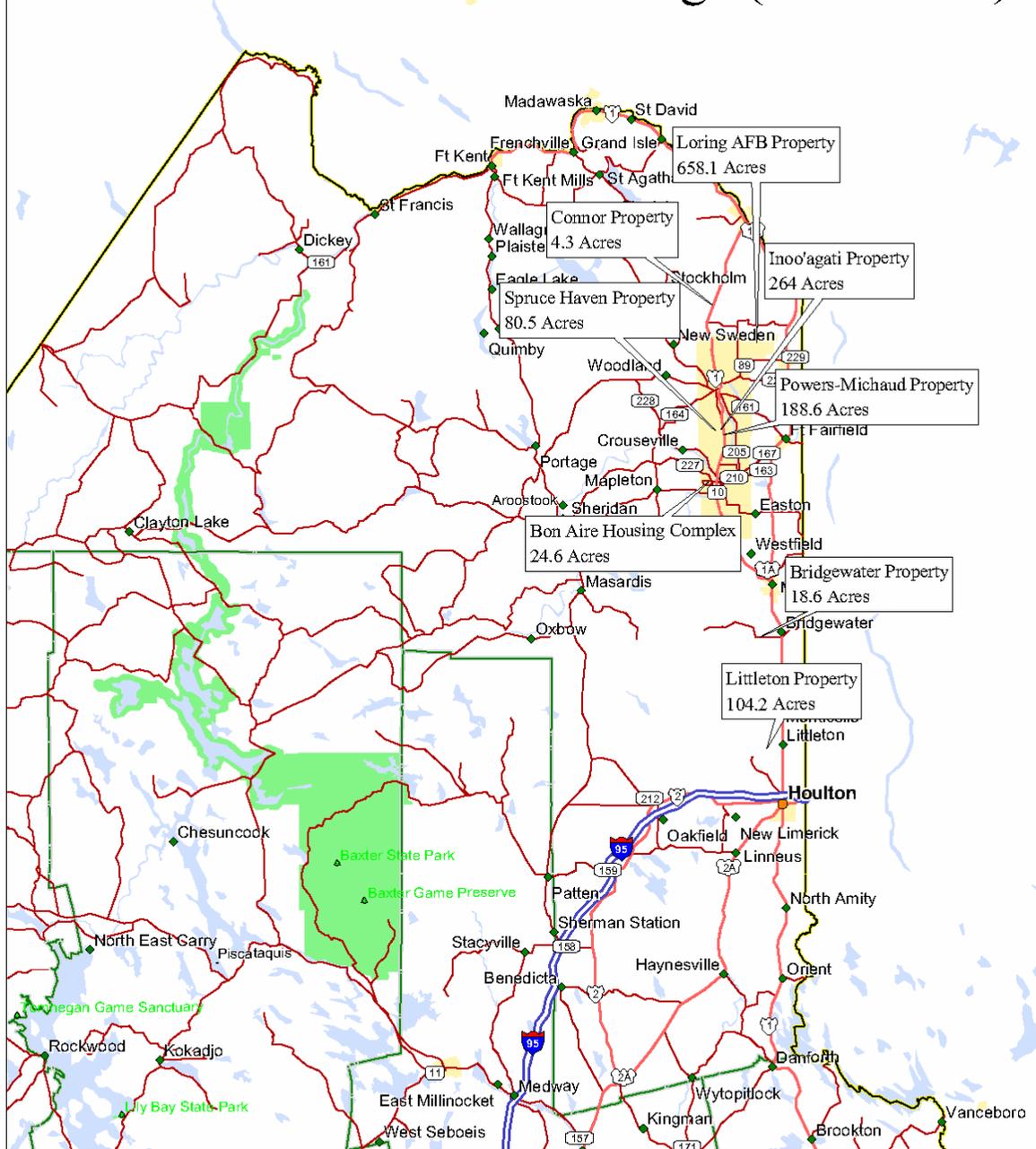


Aroostook Band of Micmacs

- **Federally Recognized by Congress in 1991**
- **1,000 Enrolled Members**
- **Largest Maritime Tribe in Eastern Canada (50,000+ Members, 27 Reserves)**
- **Tribal Council form of Government (Elected body consists of Tribal Chief, Vice Chief, and 9 Tribal Council Members)**
- **Current land holdings include approx 800 acres non-BRAC acquired property**



Micmac Tribal Land Holdings (June 2003)



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Scale 1:1,000,000 (at center)
 20 Miles

- Major Road
- Major Highway
- Interstate/Limited Access
- County Seat



Project Partners

US DOE
Tribal Energy
Program

KEMA
(energy
consultants)



Aroostook Band of Micmacs

Lori Colombo
(planning
consultant)



Project Background and Introduction

- **US Department of Energy Grant**
 - “First Steps Toward Developing Renewable Energy and Energy Efficiency on Tribal Lands”
- **Maine among highest energy costs nationwide (approx 10,000 hdd, electricity approx \$0.13 per kWh)**
- **Energy one of ABM highest expenses**
 - Tribal government spends >\$200K annually on energy and energy assistance programs
- **Opportunities Evaluated:**
 - Energy Efficiency (residential, commercial)
 - Renewable Energy (wind)



Project Goals and Objectives

- **Reduce Energy Costs**
- **Energy Independence**
 - Independence from outside suppliers
 - Self-Determination
- **Economic Development**
 - Attract Businesses / Support Loring AFB Redevelopment
 - Job creation
 - Generate Tribal Revenue

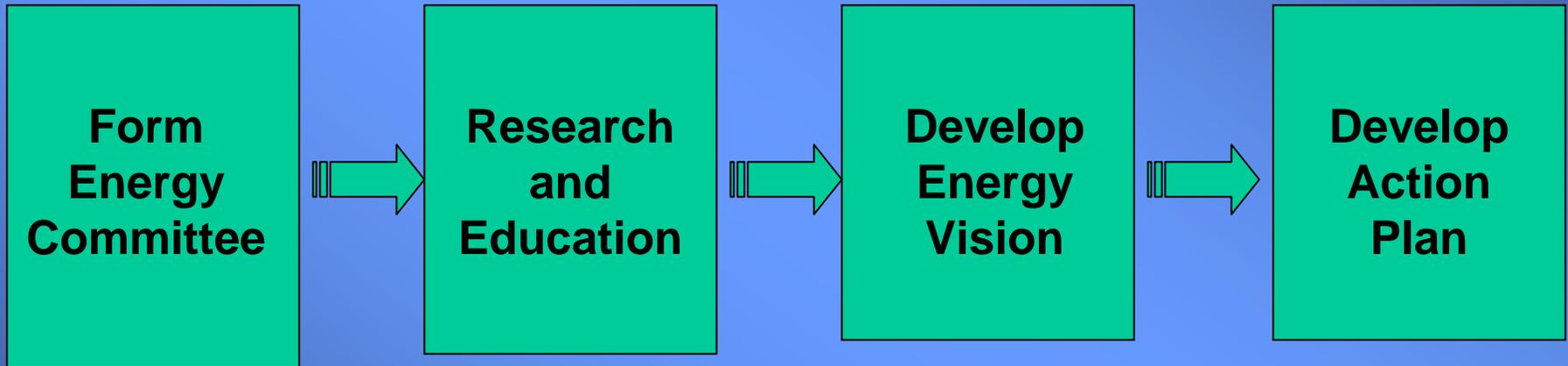


Community Benefits

- **Benefits for the Tribe:**
 - Reduce energy costs to free up funds for other priorities
 - Greater self-sufficiency
 - Reduced reliance on imported fossil fuels
- **Benefits for Individuals:**
 - Lower energy bills



Project Activities



Preliminary Research Findings

- **Energy efficiency audits find most buildings have only moderate efficiency upgrade opportunities**
- **Based on wind resource assessment, three of seven sites studied most promising for wind turbine siting**
 - **Wind resources are moderate**
 - **Grant financing important to economic feasibility**



Preliminary Findings: Energy Efficiency

- **Most energy efficiency savings in Presque Isle**
 - largest and oldest buildings.
 - Majority of the tribe's energy expenditures
- **Audits performed at:**
 - 36 Micmac – 2-family
 - 26 Northern – 2-family
 - 51 Micmac – single-family
 - 52 Micmac – single-family
 - Housing & Real Estate Building – converted 2-family
 - Head Start Building – converted 2-family





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Energy Efficiency Audit Findings

Building	36 MicMac	51 MicMac	52 MicMac	26 Northern	Head Start	Housing/ R.E.
Smart Thermostat	3.3	3.8	3.9	3.7	6.8	6.2
Lighting Retrofit	3.1	3.0	3.0	3.1	2.3	2.4
Refrigerator Replacement	1.5	-	2.8	-	1.6	1.6
HWH Pipe Insulation	4.9	5.9	5.9	4.9	10.4	5.5
R-30 Floor Insulation	-	1.2 (R-19)	1.2 (R-19)	-	4.9	4.7
Sillbox Insulation	7.7	-	-	7.8	-	-
Total Estimated Initial Cost	\$879	\$1899	\$2449	\$329	\$5041	\$4514
Life Cycle SIR	2.6	1.5	1.8	4.4	4.1	4.2



Energy Efficiency Audit Findings

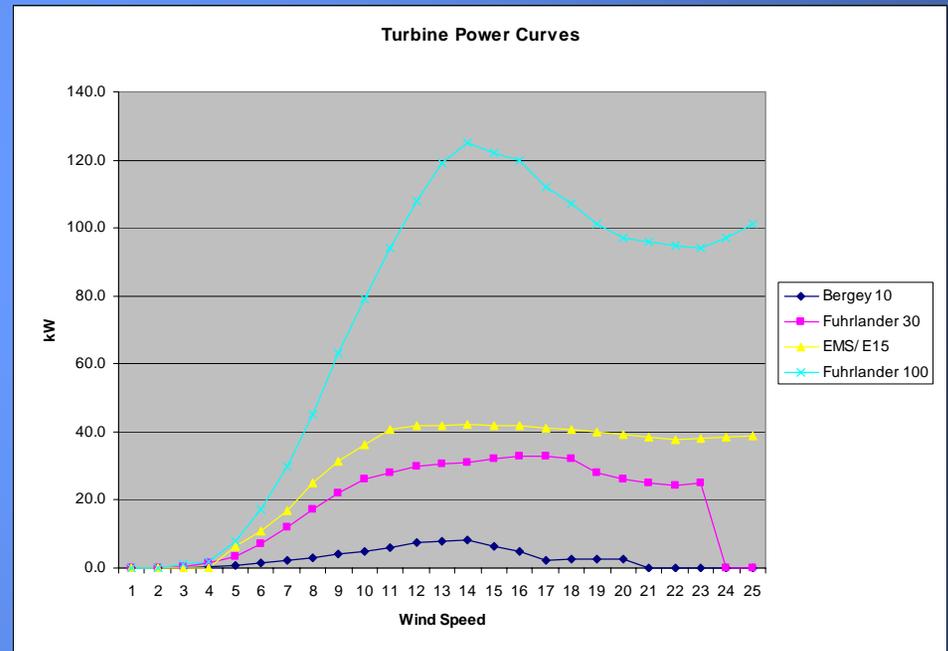
	Residential	Commercial
Average Total Cost of Recommended Measures	\$ 1,389	\$ 4,784
Average Annual Energy Savings	\$ 307	\$ 2,265
Approximate Annual Energy Costs	\$ 4700	\$ 11,750
Percent Annual Savings	6.5 %	19.2%
Simple Payback in Years	4.1	2.1

KEMA recommends setting priorities based upon the individual measures with the highest SIRs.



Wind Resource Assessment

- **Four turbine options were explored:**
 - Bergey 10 – 10 kW
 - Fuhrlander30 - 30 kW
 - EMS/E15 – 35 kW
 - Fuhrlander 100 – 100 kW
- **Power curves show projected production at different wind speeds**



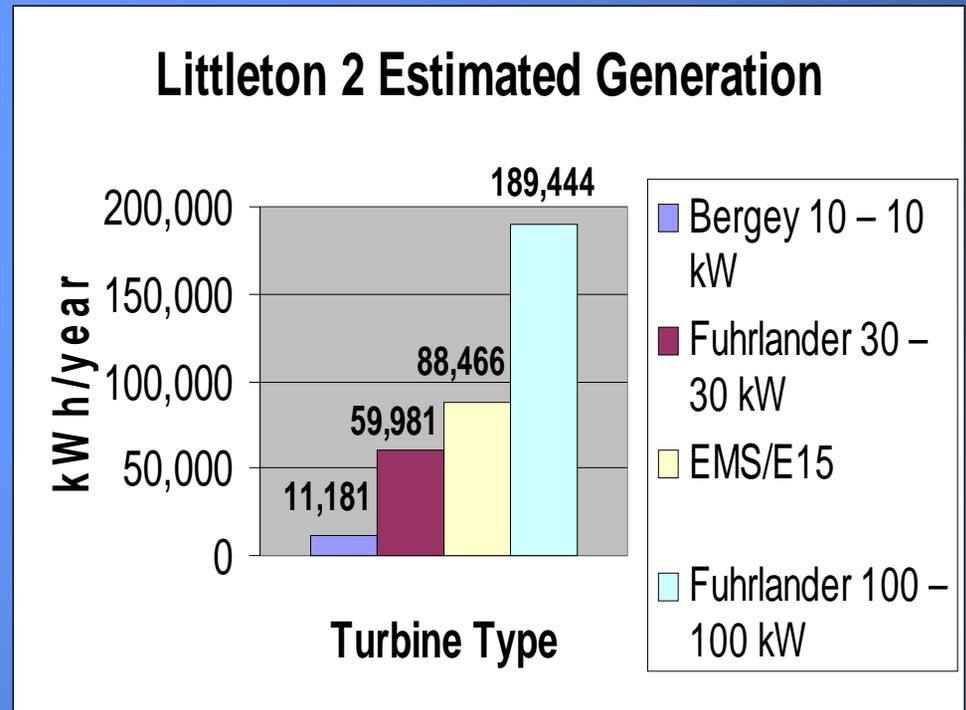
Financial Analysis – Best Case

	Admin Building Fuhrlander 100	Caribou 1 Fuhrlander 30	Littleton 2 Fuhrlander 30
Net Annual Energy Yield (kWh)	159,059	65,348	69,602
Total Project Cost	\$ 327,250	\$134,750	\$134,750
Average Annual Cash Flow (\$000)	\$ 7.2	\$2.9	\$3.9
Cumulative Cash Flow (\$000)	\$ 143	\$58	\$78
Net Present Value (\$000)	\$ 64	\$26	\$38
Positive Cash Flow Each Year?	Yes (except year 1)	No	Yes



Wind Resource Assessment: “Littleton 2”

- Littleton 2 located on residential street at top of hill beside homes
- Strongest wind resources exist at Littleton 2 – 6.3 m/s average wind speed at 50 meters
- Maximum generation at the site is 189,444 kWh per year
 - Equivalent of 54% of total electric load for ABM tribally-owned buildings



Vision Statement

The Aroostook Band of Mi'Gmaq/Micmacs embrace energy efficiency and renewable energy to become increasingly energy independent and to reduce costs. Using proven and new technologies, the tribe harnesses natural resources from the wind, the land and the sun to provide half of its energy needs. New housing is designed and constructed with energy efficient features to reduce tribal members' energy bills. The tribe's renewable energy and energy efficiency programs have reduced energy bills by over 25%.



Next Steps

- **Draft Five Year Strategic Plan that Includes The Following Activities:**
 - **Energy efficiency**
 - Complete Audits on Bon-Aire Housing Units
 - Conduct Appliance Inventories/Replacements
 - Extensive Energy Audit Training for Tribal Maintenance Personnel
 - Weatherization Training for Tribal Maintenance Personnel
 - Upgrades for Bon-Aire Housing Units
 - Incorporate Green Building Techniques into Future Facility Development Plans (develop building codes)
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Next Steps (2)

- **Renewable Energy**
 - **Conduct Wind Studies on Bon-Aire & Littleton Sites**
 - **Develop Geothermal Pilot Project for Evaluating Feasibility of Residential Geothermal Projects**
 - **Examine Potential for Wind Energy on Loring Industrial Site**
 - **Re-examine Potential of Wind Energy Payback on Caribou Site After Creating A Master Site Development Plan**



Next Steps (3)

- **Identification of Project Funding Sources**
 - **US DOE First Steps Feasibility Grant**
 - **USDA Renewable Energy Program
(Implementation Following Feasibility)**
 - **Clean Renewable Energy Bonds (CREBS)**
 - **Sale of Green Tags**
 - **HUD ICDBG Housing/Community Facilities
Grant for Implementation of Energy Efficiency
in New & Existing Tribal Facilities**



Next Steps (4)

- **Evaluate reuse options at Loring Air Force Base Property**
- **Incredible opportunity for energy project**
 - 7.5 million gallons of storage tank capacity
 - Coal storage yard with hoppers and associated infrastructure
 - Pipeline connection to deep-water port on coast, railroad spur
 - Large potential source of biomass



Questions

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