

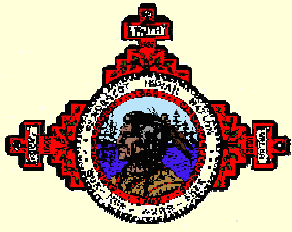


# Penobscot Indian Nation



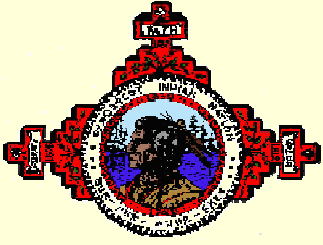
*“People of the Dawn”*

*“Each sunset brings on a new dawn of renewable energy”*



## PIN Energy Project Deliverables

- **Reduce energy usage and costs in tribally-owned facilities and in the home of tribal members.**
- **Develop energy resources on tribal lands that create jobs and creates revenue for the Nation, economic development for the region in Western Maine and greater tribal energy self-sufficiency.**



# ENERGY MISSION

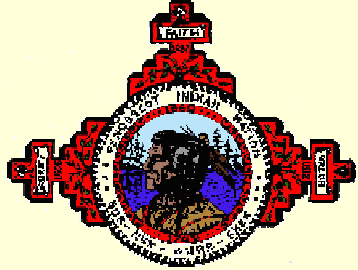
- ***“The Energy Mission of the Penobscot Nation is to improve social and economic well-being and development of the nation and its members through education about energy matters, conservation of energy resources, and development of environmentally acceptable, culturally appropriate, and economically cost-effective sources of renewable energy...”***



# ENERGY VISION

- ***The Energy Vision of the PIN is to maximize the efficiency of energy usage and develop energy resources in ways that will sustain current and future generations by addressing the economic, environmental, and social issues of energy within the context of PIN culture, traditions and established tribal policies for the wise and prudent usage of tribal forest, water, and wind resources.***





# Energy Project Deliverables

## VISION"/Strategic Plan



## CITGO Home Heating Oil Program



## Alder Stream Wind Power Project

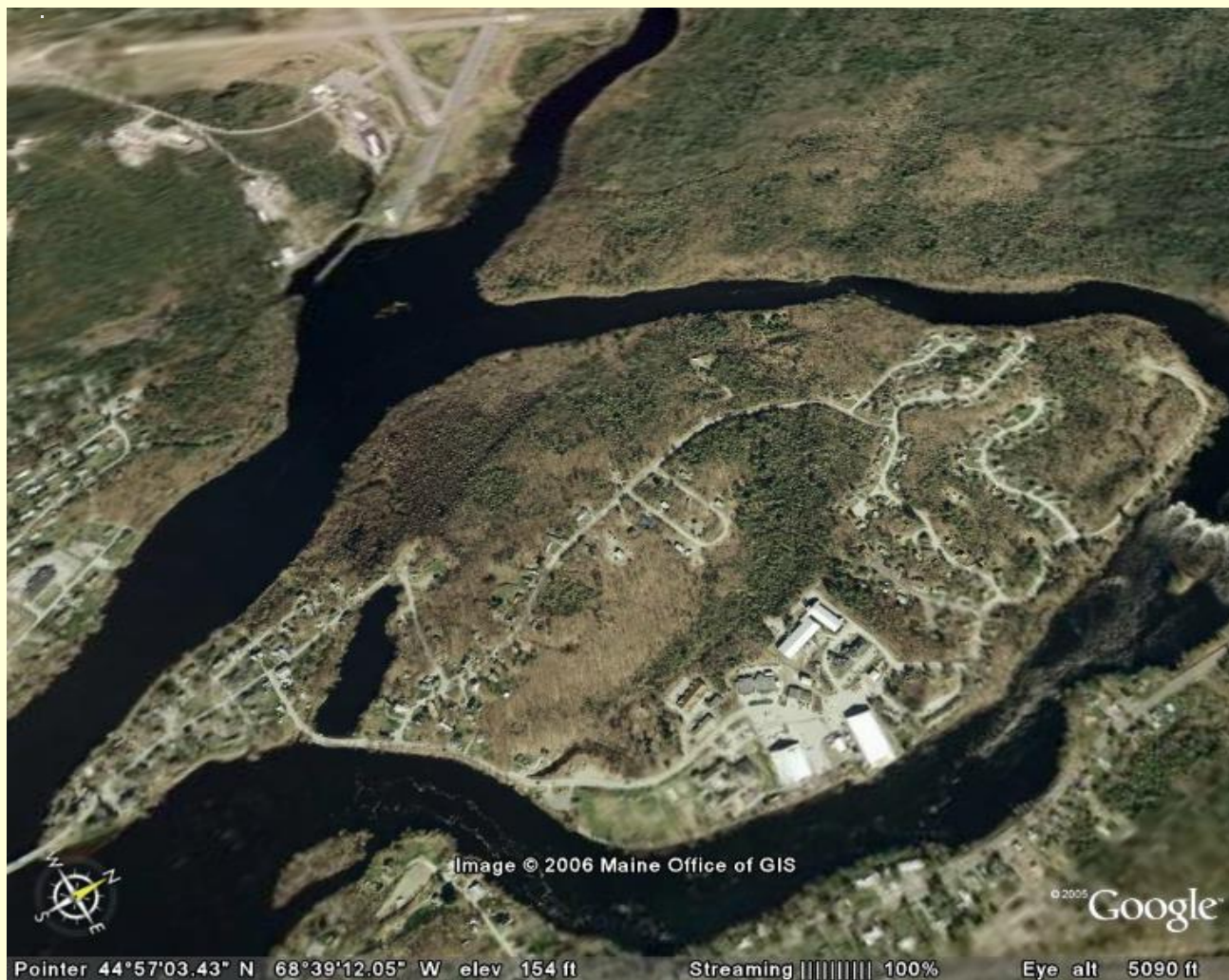


## Energy Efficiency Audit





# PIN Indian Island- Arial View







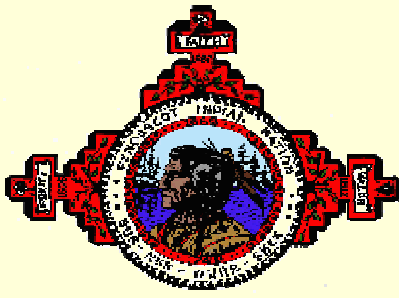
# Energy Committee Meetings



Doug Baston and Ed Holt  
Project Consultants

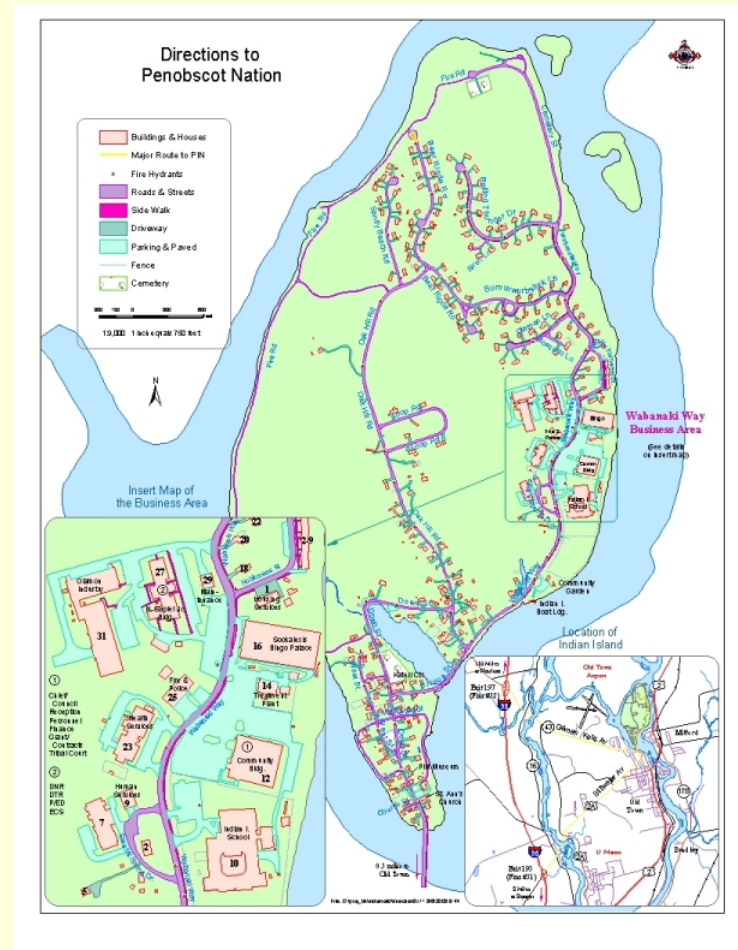


Mike Bear, David Pardilla, &  
Charles Francis



# VISION/Strategic Plan

- **Strategic Energy Plan**, including:
  - Baseline assessment, or “Where we are”
  - **Vision**, goals and objectives, or “Where we want to be”
  - Action plan, or “How you’re going to get there”
- Our focus is on renewable energy and energy efficiency options
- Result: Long-term sustainable plan for energy self-sufficiency or energy development on tribal lands

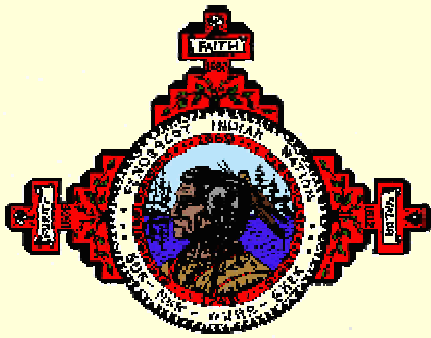






# PIN Tribal Facilities





# Energy Efficiency Audit



Alan Mulak, P.E., Energy Audit  
Consultant



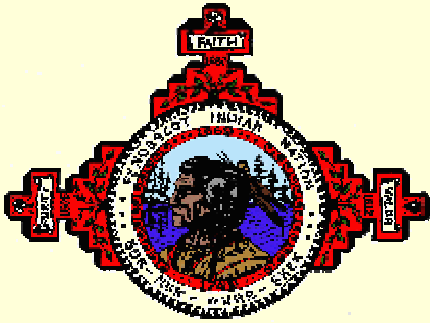
Bingo Hall



# Facility Energy Audit Study

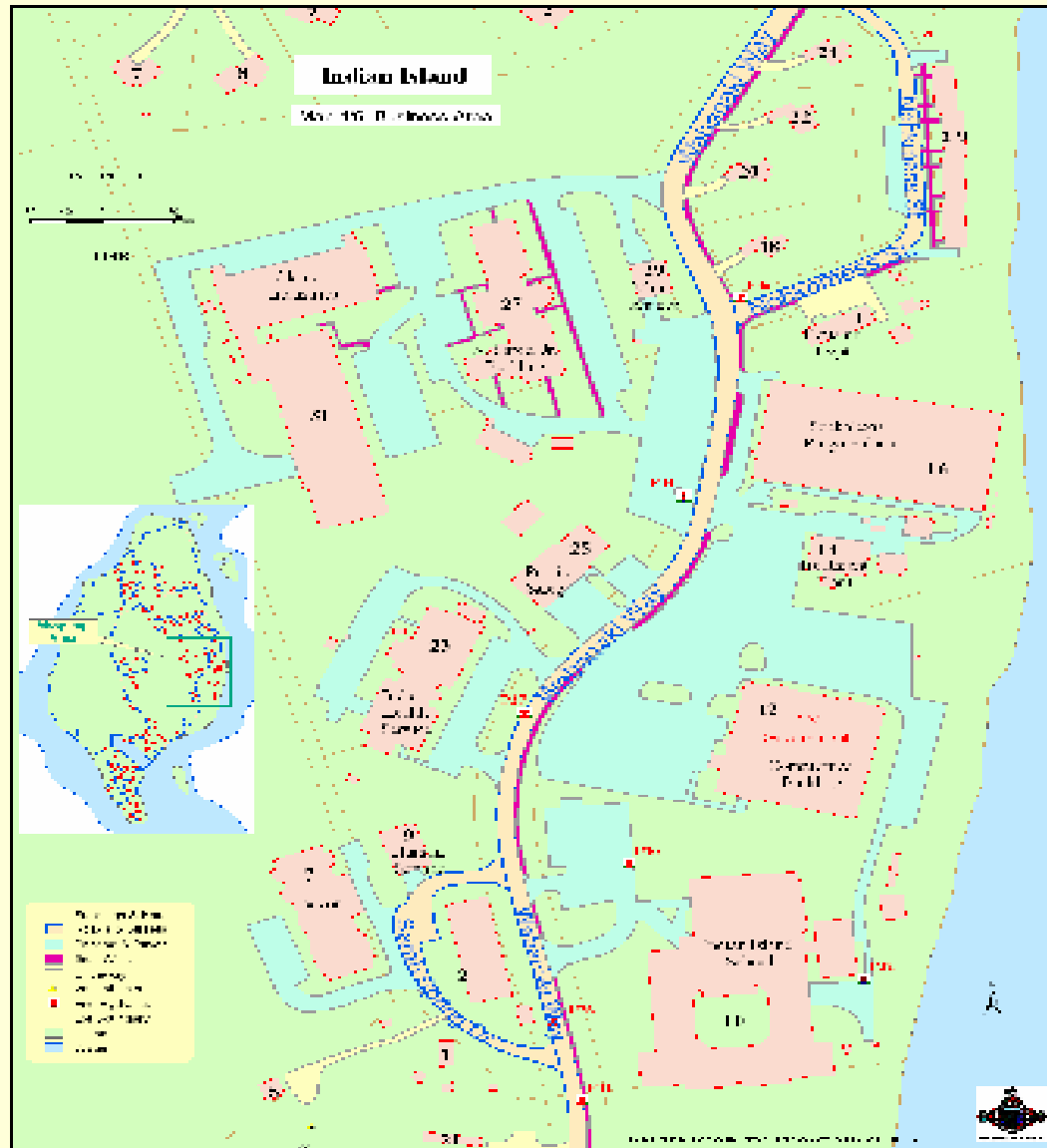
- **Section one** of this study provides summary level information on findings, recommendations, and projected savings if all measures are implemented.
- **Section two** of this study breaks out each facility separately and all are contained within. Each section includes recommendations for Energy Conservation Measures (ECM) addressing the electric, oil, and gas usage in the facilities. Details of the findings and recommendations are contained in their respective sections of this report.
- A **Summary Table** showing energy savings, cost savings, implementation costs, and simple payback period for the recommended energy conservation measure considered is shown in the four sections that follow. Equipment specifications also known as “cut sheets” on recommended technologies have been included in the appendix. The cut sheets are included to offer an idea of the type of technology recommend...not the specific product.





# General Observations and Recommendations:

- The **13 facilities studied in this report** are typical of most small communities. Some are modern and in excellent shape, others are not so. The following are general observations and recommendations. More specific details can be found in the section of the report that follows. Also, these general findings have been offered in suggested priorities wherein the highest priority is recommended for immediate action, the second priority should be added to a future budget, and the lowest priority are contingent upon first and second priority recommendations being implemented.

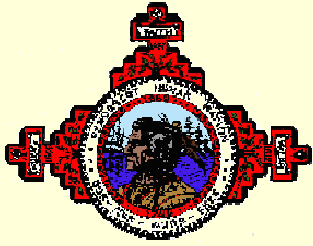




# ECM Highest Priorities

- **Lighting Retrofit.** Throughout most facilities, old technology fluorescent T12, Metal Halide HID lighting, incandescent bulbs, and incandescent exits signs are in place. This technology has been replaced by more efficient, better colored, longer lasting lamps, ballasts, and fixtures. This report recommends the immediate retrofit as detailed in each facility studied. Efficiency Maine cash incentives are available High Performance Lighting lamps and ballasts for this project.
- **Lighting Controls.** Perhaps the least intrusive ECM is the widespread installation of controls. These would apply to lighting via occupancy sensors and heat/air conditioning via set back thermostats. This report recommends the immediate installation of energy controls as detailed in each facility studied. Efficiency Maine cash incentives are available for the electrical portion of this project.
- **Setback Thermostats.** This inexpensive, easy to program devices would eliminate the problem of heat (and in some cases, air conditioning) being left on overnight when the various building are unoccupied. The savings in oil and propane would be significant. Recommended are Honeywell (or equivalent) T1000 which are essentially a 5 day / 2 day setting – perfect for most PIN buildings.
- **Actuator Replacement.** Actuators are the moving device inside wall thermostats. They generally need replacement every five years or so. They fail open which results in uncontrolled heating – an issue which anecdotally, is a widespread problem on the PIN. Costing less than \$10 each, the actuators in all thermostats older than 5 years could be changed in a few days. The energy savings potential is very great.

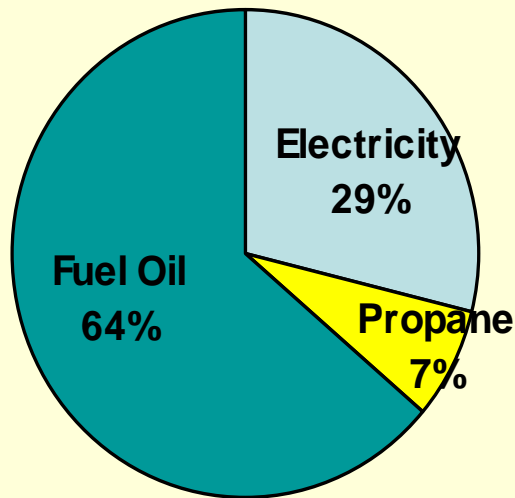




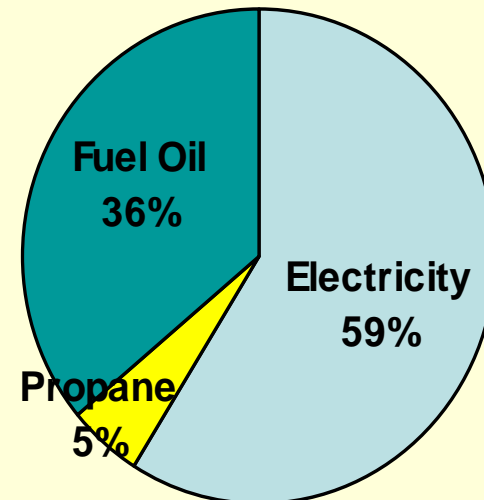
# PIN ANNUAL ENERGY COSTS

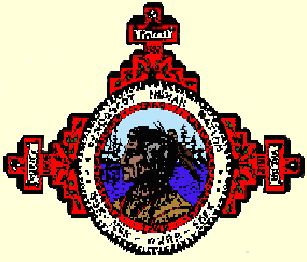
- In 2005, Nation's Annual Energy Cost was over **\$482,000**

Energy Use by Source

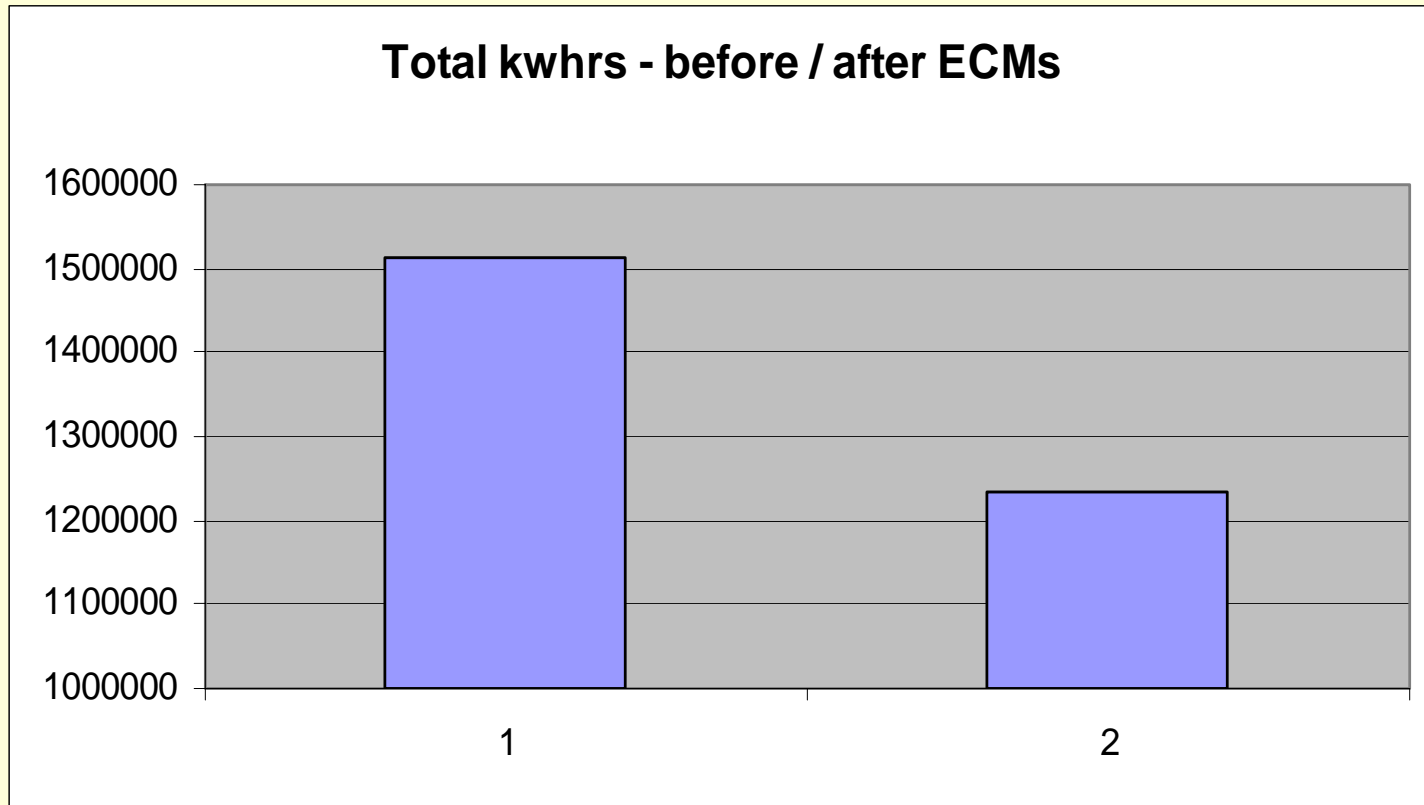


Energy Cost by Source

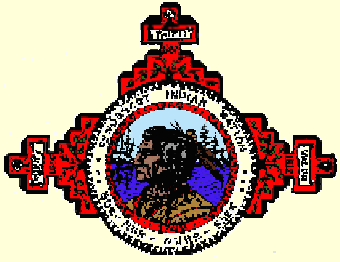




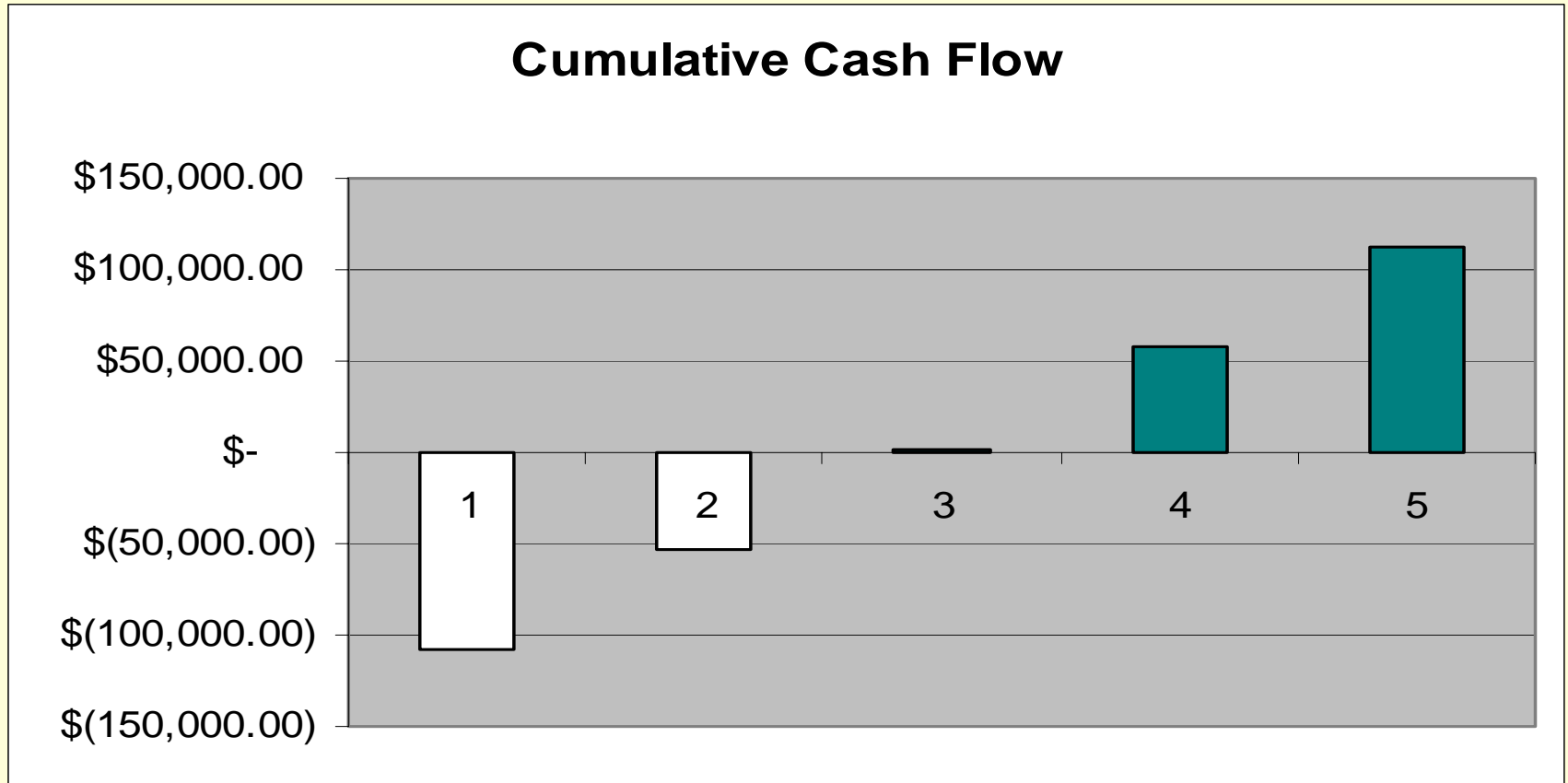
# Summary of Projected Economics



**Graph 1.3.1 (above)** illustrates the results in energy savings measured in kwhrs if all ECMs are implemented. The savings is estimated to be **278,553 kwhrs** which at current Bangor Hydro Electric rates amounts to **\$52,925 per year**.



# ECM Breakeven Point



- **Graph 1.3.4 (above)** illustrates the projected cash flow is all measures are implemented in the first year of the project. **Based upon estimates, the break-even time period is roughly 2.05 years.**



# Tribal Facilities Ranked by Area w/ Energy Use

Facility	Area	Electricity	Propane	Oil
	sq. ft.		gallons	
<b>Sockalexis Bingo</b>	<b>125,000</b>	<b>118,800</b>	-	<b>8,630</b>
<b>Gov / Community</b>	<b>37,109</b>	<b>175,060</b>	-	<b>19,856</b>
<b>Olamon Industries</b>	<b>37,000</b>	<b>166,800</b>	<b>3,067</b>	<b>16,237</b>
<b>Indian Island School</b>	<b>35,800</b>	<b>334,725</b>	-	<b>20,345</b>
<b>Health Center</b>	<b>18,700</b>	<b>164,200</b>	-	<b>5,011</b>
<b>Nick Sapiel Jr. Bldg.</b>	<b>11,019</b>	<b>262,520</b>	<b>10,373</b>	-
<b>Fire / Police</b>	<b>5,460</b>	<b>42,063</b>	-	<b>3,698</b>
<b>Sewage Treatment</b>	<b>5,000</b>	<b>130,520</b>	-	<b>3,298</b>
<b>Sarah Spring Nursing</b>	<b>3,700</b>	<b>71,000</b>	-	<b>2,637</b>
<b>Human Services</b>	<b>2,200</b>	<b>18,076</b>	-	<b>1,351</b>
<b>Assisted Living</b>	<b>2,100</b>	<b>3,746</b>	-	<b>665</b>
<b>Maintenance Garage</b>	<b>1,800</b>	<b>12,796</b>	-	<b>1,236</b>
<b>Housing Dept</b>	<b>1,700</b>	<b>11,755</b>	-	<b>1,236</b>
<b>Totals</b>	<b>286,588</b>	<b>1,512,061</b>	<b>13,440</b>	<b>84,200</b>

# 2005 Annual Energy Costs for Tribal Facilities

Facility	Annual Energy Cost	Percent of Total
Indian Island School	\$ 105,305	22%
Gov't / Community Center	\$ 73,966	15%
Olamon Industries / PIN Rx	\$ 70,130	15%
Nick Sapiel Jr. Building	\$ 67,306	14%
Health Center	\$ 41,471	9%
Sockalexis Bingo Palace	\$ 40,263	8%
Sewage Treatment Plant	\$ 31,560	7%
Sarah Spring Nursing Facility	\$ 18,896	4%
Fire / Police	\$ 15,573	3%
Human Services	\$ 6,204	1%
Maintenance Garage	\$ 4,965	1%
Housing Department	\$ 4,767	1%
Assisted Living Facility	\$ 2,075	0%
Total	\$ 482,481	100%



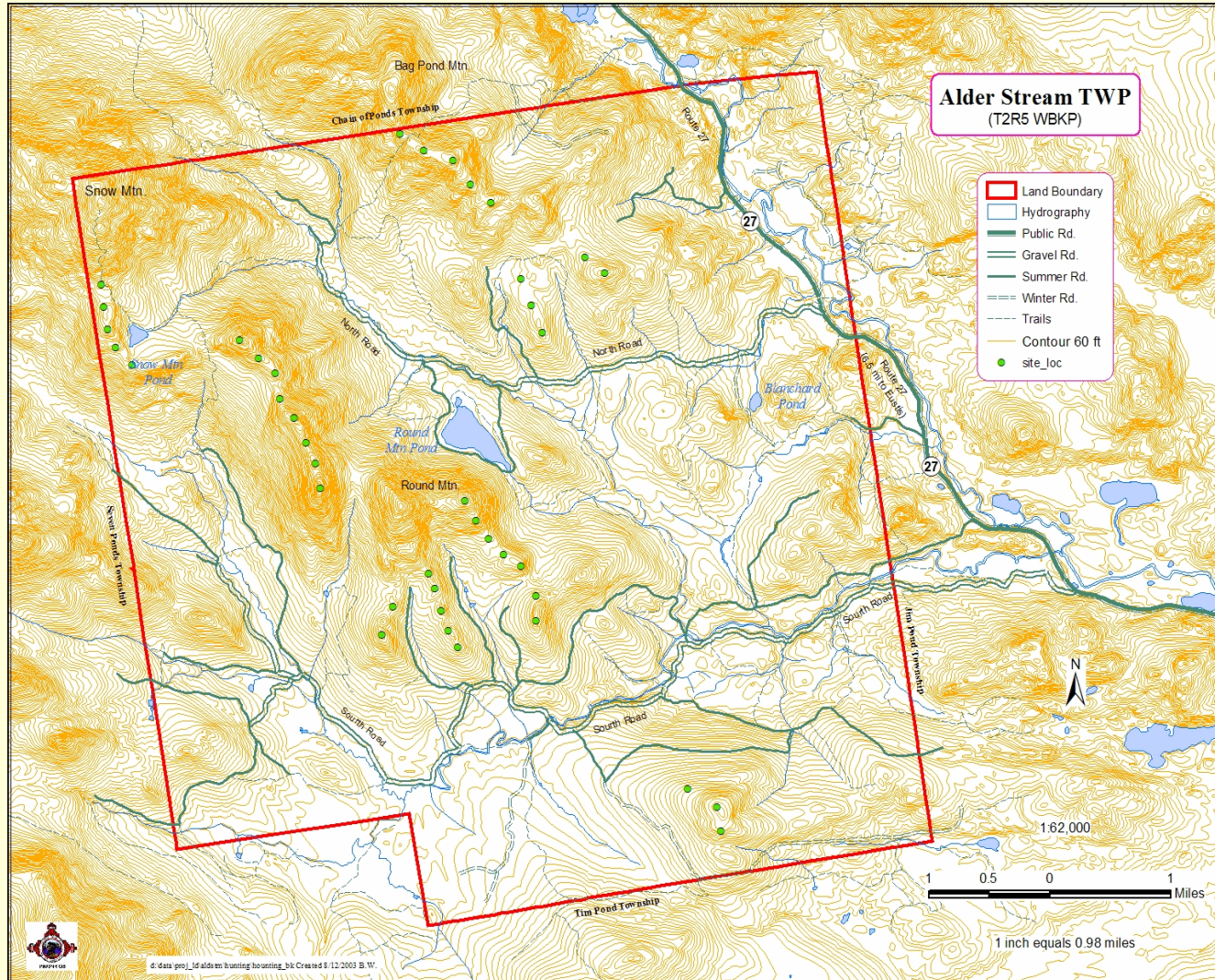
# Alder Stream Township



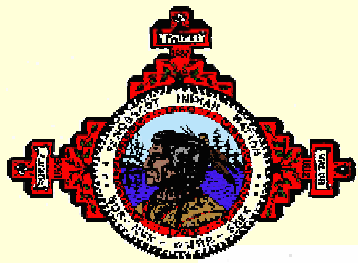




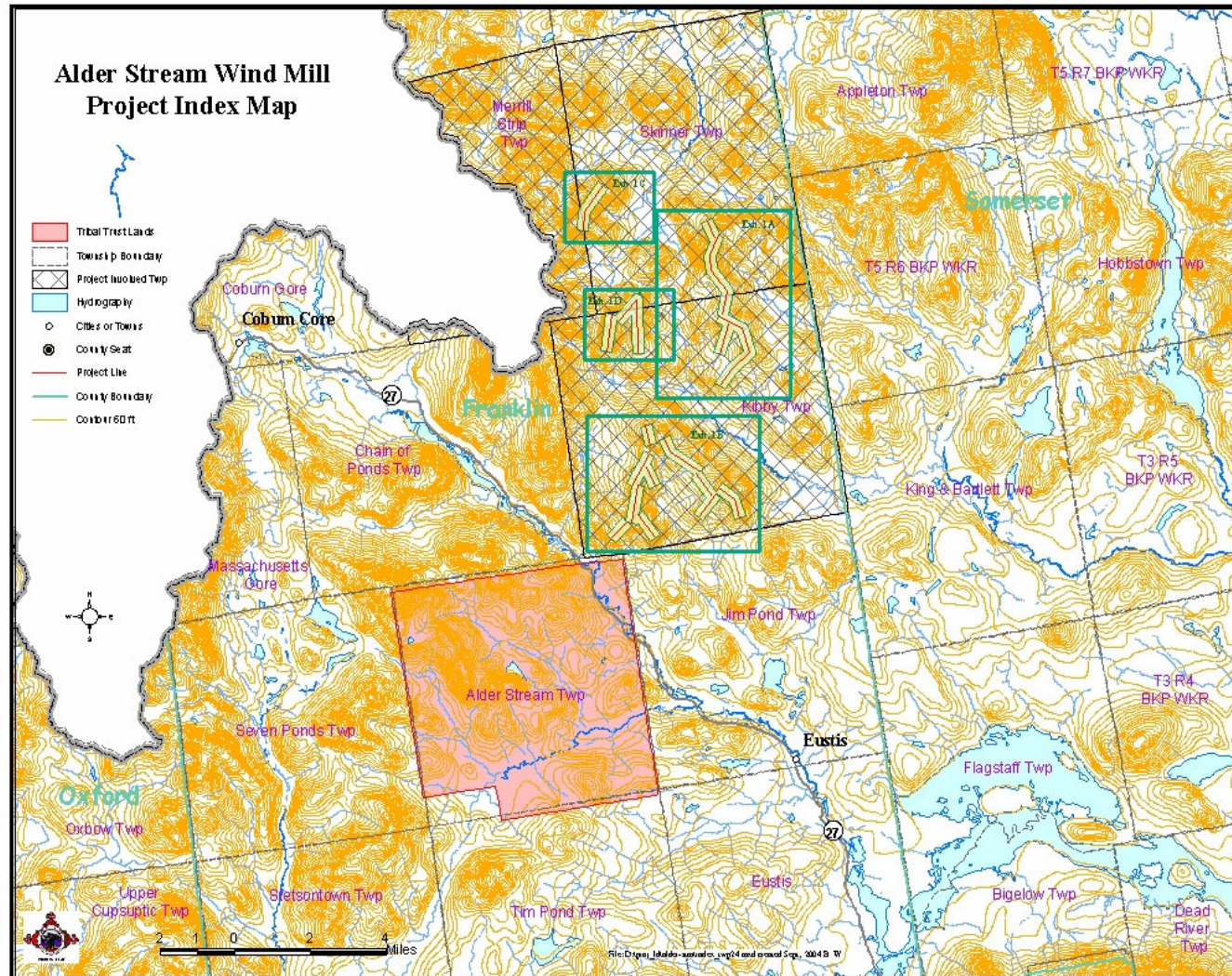
# AST 50 MW Wind Power Project

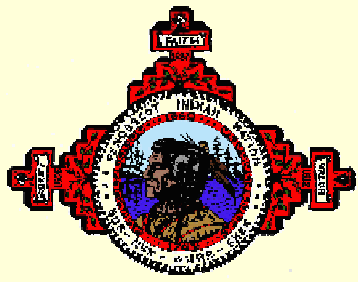






# AST Wind Power Index Map





# CITGO Home Heating Oil Program



Jorge Toledo



President Hugo Chavez



# Annual Fuel Oil Use for Tribal Facilities

Facility	Annual Oil Use Gallons/year	Percent of Commercial Use
Olamon Industries / PIN Rx	20,345	24%
Sockalexis Bingo Palace	19,856	24%
Gov't / Community Center	16,237	19%
Health Center	8,630	10%
Human Services	5,011	6%
Sarah Spring Nursing Facility	3,698	4%
Sewage Treatment Plant	3,298	4%
Housing Department	2,637	3%
Fire / Police	1,351	2%
Nick Sapiel Jr. Building	1,236	1%
Maintenance Garage	1,236	1%
Assisted Living Facility	665	1%



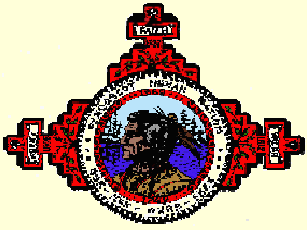
# Oil Pricing Economics

Chart 1.3.6 Oil Comparison

Annual		Cost per Gal. Retail	Cost per Gal. 40%	Projected
Usage	Gallons	\$2.40	\$1.40	Savings
Current	84,200	\$202,080.00	\$117,880.00	\$84,200.00
After ECMs	77,409	\$185,781.60	\$108,372.60	\$77,409.00

Chart 1.3.6 (above) illustrates the difference between continued purchases of oil from Malefant Oil and the contracted amount of **\$1.40 / gallon** from Venezuela.





# Penobscot Indian Nation Energy Resources

## **Priority Ranking**

- 1. Wind Energy Resource Potential
- 2. Hydroelectric Potential
- 3. Biomass Resource Potential
- 4. Geothermal Energy Potential
- 5. Solar Energy Potential

# Penobscot Indian Nation

## *2006 Strategic Energy Plan*



**A long-term plan for energy self-sufficiency and sustainable energy development on tribal lands**