

COMMUNITY ENERGY

PLANNING TO
IMPLEMENTATION

EAGLE LAKE FIRST NATION – MIGISI SAHGAIGAN

Eagle Lake First Nation – Migisi Sahgaigan

- Anishinaabe community located in Northwestern Ontario, 25 km southwest of Dryden with a four hour drive to the Manitoba border.
- One of 28 communities in Grand Council Treaty #3
- Population 700 – on reserve 275
- Follow our ‘Resource Laws’
 - Manitou Aki Inokonigawiin – Treaty 3
 - Manachi Totaa-Aki – Migisi Sahgaigan

Eagle Lake First Nation – Migisi Sahgaigan



Renewable Energy for Economic Development

- Renewable Energy a natural fit for community
- Small Water Power project, initial interest – not supported by the community
- Wind Energy – First attempt at developing an economic base – initiated 2003
- Solar Farm – Second attempt to develop renewable energy – initiated 2009

Financial Incentives: Ontario

- 2004 - Ontario opened fixed-price renewable energy market (OPA purchaser) – committed to 1 350 megawatts by 2007
- Small producers (First Nations, farmers, community groups, individual businesses, Municipalities, land owners)
- ‘Standard Offer Program’ - Wind, Biomass and Small hydroelectric - \$0.11 /kwh – Solar at \$.42/kwh
- 2006 - 1,300 megawatts already contracted
- Committed to an additional 1,000 megawatts to Ontario’s electricity supply (250,000 homes) over next 10 years
- 2009 – Feed-In-Tariff (FIT) program introduced – stable prices with long-term contracts
- 2012 – contract rates were reduced - 2016 – FIT program terminated

Objectives of 'Standard Offer Program'

- Reduction of air pollution
- Promote reliability of supply
- Protect the environment – sustainability
- Creation of new, high-skilled jobs
- Reduce economic debt
 - Business model not viable without government subsidies
- Ontario First Nations Energy Alliance active at the time
 - Originated In Manitoulin Island – surrounding communities

New Technology

- Early 2000's - time when renewable energy technology was developing and rapidly changing – hardware - software
- Challenges for Development of Industry:
 - Delay in supply of materials
 - Advancing technology rendered capital purchases as obsolete in short order
 - Somewhat speculative investments – access to funding
 - Policies not always supportive (regulation)
 - Access to land
 - Approvals to proceed

Economic Landscape in Ontario

- Annual energy cost escalation rate – 5%
- Inflation – 2.5%
- Discount rate 12%

Eagle Lake FN Experience: Wind Farm

- Intension of community to develop a 10MW Wind Farm
- Worked with a Consultant – MOU to initiate contract
- Sourced out technical support from other sources
- Split on equity 55-45 – some debate about taking out equity prior to split
- Explored funding through FedNor, NOHFC and other smaller sources
- Team intention to secure funding prior to community engagement

Key Components: Project Development

- The Land
- Technical Know-How
- Business Planning
- Internal Processes
- External Engagement

Key Components: The Land

- Determining size of project
- Site Selection
 - Selected site – 1 km away from closest home in community
- Access to 3 phase power
- Site Preparation
- Road Access

Key Components: Technical Know-How

- Appropriate guidance and service provision
- Feasibility study
- Technical support:
 - Environmental Assessment (avian/bat studies,
 - Connection Assessment
- Life span of project

Key Components: Business Planning

- Funding sources – financing
- Develop business plan
- Partnership decision

Key Components: Internal Processes

- Formal Name of Project
- Legal proceedings:
 - Incorporation
 - Establish Board
 - Partnership agreements
 - Service agreements)
- Community engagement
- Board nominations
- Capacity development (training)
- Decision-making processes (i.e. increase in cost factors)

Key Components: External Engagement

- Inform potential people and communities being impacted:
 - City of Dryden
 - Surrounding Municipalities
- Requirement for Support
- Potential for Investors

Initial Intensions – Eagle Lake FN

- Intension - ELFN would own and operate 1 to 5 wind turbines (begin with one) – 10 MW
- Project life – 30 years
- 10% Interest Rate over 20 years
- The distribution model at the time was based on \$0.11/kwh
- The system would connect to the local 3 Phase Distribution network in the Dryden area.

Early Stage Cost Projections

September 2006

- Equipment (turbines, etc.) \$3.8M – 52.2%
- Plant \$1.2M - 16.7%
- Development \$835,000 – 11.8%
- Engineering \$610,500 – 8.5%
- Feasibility Study \$245,000 - 3.4%
- Miscellaneous (contingencies) \$540,000 – 7.5%

- Total \$7.2M – 100%

Additional Cost Factors:

January 2007

- Environmental Assessment – Bat study \$16,000
- Bird study \$2,900
- Environmental Reports \$2,000
- Independent Wind Analysis (grid assessment) \$20,000
- Geophysical studies re Construction (Neegan Burnside) \$15,000
- Installation expense and Site Preparation \$16,000
- OPA – Connection Assessment \$4,500
- Salaries \$45,000
- Operational expenses \$41,000

- Total \$162,700

Annual Operational Cost Factors:

- Total O/M - \$127,600
- Debt Payments
- Upgrades (drive train and blades) – every 10-15 years

Favorable Factors:

- Good site location
- Easy access to site
- Close proximity to Dryden
 - Source of materials
 - Attracting labour
- Project did not conflict with Resource Laws

Challenges: Pre-Development Studies

- Bat study – bird (avian) mortality – 2-3 years of assessment
- Potential need for ‘System Impact Assessment’
- Exceeding pre-determined heights (hub heights) necessitated radar assessment – 50-80 m common
- Connection Assessment cost factors (Hydro One) critical factor

Challenges: Development and Operations

- Difficult to secure insurance for project (development and operations)
- Initial projected timeline – one turbine in three months – not realistic
- Annual megawatts production important factor when buying turbines
- Costs of interconnection, upgrading the distribution line and raising the line voltage can make or break the economic feasibility of a project
- Critical time frames must be met to ensure funding is in place

Challenges Specific to Eagle Lake FN

- Carrying wage of Consultant \$200,000/annual – when in fact he was a partner in the Engineering Firm – Conflict of Interest
- Community capacity development costs (training) – not factored in
- Conflicting information re Environmental Assessment - \$40,000 vs. \$250,000-\$450,000
- Geophysical report not sufficient – (availability of aggregate for road construction, tower foundation conditions) required a qualified Geotechnical Engineer or Geologist
- Eagle Lake's geographic location not optimal for wind farm. The average annual wind speed reports were not as promising as expected

Factors Leading to Project Termination

- From Chief and Council perspective, Consultant's performance unsatisfactory
- Community advised against partnerships
- Concerns about unexpected rising costs
- Business Plan and timeline, not well developed
- Relationship breakdown

Business Analysis & Outcome: Wind Farm

- Decision Point: Project requires a 10-12% return on investment – projections favorable
- Decision Point: Minimal Output – 6.2-6.3 MWh – ELFN – projections borderline
- Decision Point: Project development, not well managed
- Outcome: Project reached near conclusion of Phase 1 of 3 phases
- Outcome: Chief and Council pulled back from investing the \$1M and signing the contract

Eagle Lake FN Initial Intentions: **Solar Farm**

- Intension of community:
 - To develop a 250 KW Solar Farm on 5 acres of Reserve land
 - To install 100 KW rooftop solar on the community center
- 2009 - 2011 - Worked with business development firm to initiate a feasibility study and business plan – to be wholly owned and operated by Eagle Lake FN
- Sourced out technical support from other sources
 - Equipment costs
 - Projected energy production
- Project dependent on OPA FIT program

Terms of Purchase Price Agreement for Successful Proposals

- Applied for a 20 year fixed-price contract through OPA
- Prices at time of application – \$0.44.3/kWh
- Additional \$0.15 for ground mounted projects controlled by Aboriginal groups
- Greater incentives for rooftop solar panels - \$0.539 to \$0.802, depending on output

Site for Solar Farm and Rooftop Installation Eagle Lake First Nation



Projections: Solar Farm

- Panels for 250 KW Solar Farm - mounted, dual-axis tracking mechanisms
- Price point \$1.825M
 - Materials, labor, installation, connection costs
 - 3 year warranty
 - Includes 10% for contingencies
 - HST to be charged initially – Recoverable
- Energy production estimated to be 493,000 kWh
- Projected annual revenues - \$226,000
- Anticipated a 20 yr OPA FIT contract

Projections: Rooftop Installation

- 100 KW Rooftop Installation – Community Hall
- Price point: \$530,000
 - Materials, labour, installation, connection costs
 - 3 year warranty
 - Includes 10% for contingencies
 - HST to be charged initially – Recoverable
- Additional \$184,000 soft costs
 - Impact studies
 - Application and professional fees
 - Financing
- Energy production estimated to be \$120,000 kWh
- Projected annual revenues - \$85,000 kWh
- Anticipated a 20 year OPA FIT contract

Operational Costs

➤ Equipment maintenance	
➤ One regular employee	\$12,000
➤ External service provider (1% of capital)	28,050
➤ Insurance (1% of capital)	28,050
➤ Utilities	5,516
➤ Miscellaneous (contingencies)	5,000
➤ Total – Approximately 26% of Revenue	\$80,616

Financing

- Bank Financing @ 6% - commercial mortgage
- Sub-debt Financing @ 8% - financial institution
- Grant or Equity @ 0% - government or other (OPA, FedNor, INAC, ELFN)
- Amortization over 20 years – monthly payments (range of \$61,138 to 193,700 – depending on mix of financing)
- Depending on mix of financing, Net annual cash flow anywhere from \$37,000 to \$231,000

Implementation

- **Timeframes: Anticipation of approximately 8-12 months**
 - Receive OPA approval
 - Conduct the studies
 - Obtain the necessary permits
 - Install the equipment
- **Requirements:**
 - Electricity
 - System monitoring
 - System maintenance
 - Minor administrative support

Anticipated Benefits to Community & Environment

- Generation of Solar Farm – 493,000 KW per yr
- Generation of Rooftop Panels – 120,000 KW per yr
- Greenhouse Gas Reduction:
 - Solar Farm – annual offsets 30,000 lbs. of carbon emissions
 - Roof Top Solar – annual offsets 10,000 lbs of carbon emissions
 - Solar Farm – lifetime offsets 7,500 tons of carbon emissions
 - Roof Top Solar – lifetime offsets 2,200 tons of carbon

Critical Factors for Consideration

- Start-up Financing - \$2.8M
- Anticipated positive cash flow prior to debt payments - \$231,000
- Community would require minimum of 30% grant/equity funding at minimum
- Business development firm recommends pursuing 50% grant/equity funding
- Venture not feasible without OPA-FIT program

Community Commitment & Outcome

- Phase 1 – Feasibility Study - Completed
- Phase 2 – Business Plan – Completed
- Phase 3 – Application submitted to OPA – completed
- Phase 4 – Conduct Impact Analysis of solar farm installation to obtain OPA-FIT approval
 - Environmental – not completed – waiting for OPA approval
 - Geological – not completed – waiting for OPA approval
 - Archaeological – not completed – waiting for OPA approval
- OPA final decision – Proposal not approved
 - Application missing one piece of information – Site Access Rights

Eagle Lake First Nation – Migisi Sahgaigan Community Energy Plan

- 2014 S. Burnett & Associates contracted to assist with Community Energy Plan
 - Improve energy efficiency
 - Reduce electricity consumption
 - Assess opportunities for renewable energy solutions
- Plan intended to provide a vision for the community's future needs for future growth

Implementation of Energy Plan

- Began with a community profile
- Conduct a baseline energy audit to determine our current usage
- Project future needs of the community
- Explore new and existing opportunities for renewable energy – community level – individual homes
- Establish energy conservation and sustainability recommendations
- Develop Implementation plan and timeline

Community Infrastructure

- Arena – Band Office – Community Hall
- Medical Centre
- School
- Day Care
- Youth Centre
- Warehouse
- Water Treatment Plant
- Water Tower
- Round House

Recommendations

- Hired an Energy Specialist - completed
- Monitor our Energy Usage - ongoing
- Maintain an Energy Plan - ongoing
- Community Engagement – ongoing
- Hydro One Home Assistance – ongoing
- New build requirements – ongoing
- Retrofit Existing structures – future work
- Rooftop solar generation – future work
- Solar LED streetlights – future work
- Electrical Self-Generation – has potential
- Large scale renewable energy and connection point – strong community interest

Energy Specialist – Status of Work

- Hired Jamie Gardner – early summer
- Training – S. Burnett
- Community Engagement
 - Stakeholder involvement
 - Community visits
- Developed an ACEP Implementation Plan
- Community Workshops

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