PROJECT:
1.8 MW WIND TURBINE ON
TRIBAL COMMON LANDS NEAR LAKE ERIE

Anthony J. Giacobbe
Seneca Nation of Indians
and
James F. Yockey URS Inc.
May 4, 2015
<table>
<thead>
<tr>
<th>Membership and Territories</th>
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<tbody>
<tr>
<td><strong>Total Enrolled Membership:</strong></td>
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<tr>
<td>8,057 members</td>
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<td>4,006 members</td>
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</tbody>
</table>
Clans:
- Deer
- Hawk
- Heron
- Snipe

Clans:
- Turtle
- Beaver
- Wolf
- Bear
BACKGROUND
Elected Government

Elected Form of Government
- President

Elected Form of Government
- Treasurer
Elected Form of Government

• Nation Council

Elected Form of Government

• 4 Year Term, Staggered
BACKGROUND
Economic Development

- **Class III Casinos:**
  Seneca Niagara Casino, Seneca Allegany Casino, Buffalo Creek Casino

- **Class II Gaming and Entertainment Facilities:**
  Cattaraugus Territory, Allegany Territory
BACKGROUND
Diversification
PAST ACTIVITIES & PROJECTS

1.8 MW Wind Turbine on Common Lands

- DOE First Steps Grant for Strategic Energy Planning
- DOE NREL Anemometer Loan Program
- DOE First Steps Grant for Energy Organization Planning
- DOE Energy Efficiency and Conservation Block Grant
- DOI Natural Gas Assessment
- DOI Strategic Energy Planning Assistance
PAST ACTIVITIES & PROJECTS
Long-Term Energy Plan

- **Phase I: Visioning Process**
  - Community Meetings
  - Review Historical & Current Energy Resources
  - Assess Community Priorities, Energy Potential, & Environmental & Economic Issues
  - SWOT Assessment
  - Final Report

- **Phase II: Research and Assessment**
  - Tribal Resource Assessment
  - Rates & Usage Analysis
  - Infrastructure Inventory
  - Industry Relationship Assessment
  - Identification of Technical Assistance Needs
  - Review of Regulation & Jurisdiction Issues
  - Assessment of Environmental & Cultural Components
  - Identification of Future Project Funding Opportunities
PAST ACTIVITIES & PROJECTS
Long-Term Energy Plan

- Phase III: Implementation Energy Organization and Governance
  - Formation of Seneca Energy LLC
    - Staff augmentation agreement
    - Economic Development Commission (BOD)
    - Energy Steering Committee
    - Developed process to prioritize initiatives
  - Hired on as Employee of the Nation
    - Dual reporting to President’s Office and SCED
    - Balance economic development with Nation infrastructure repair and development
Identified Goals of Long-Term Energy Plan

- Create an Energy Organization
  - Centralize energy decision making for both generation and distribution
  - Create peer relationship with Utilities
  - Evaluate future energy projects
  - Develop COS methods to recover costs
  - Create billing dBase to distribute costs and benefits of electricity and NG
Identified Goals of Long-Term Energy Plan

• Self-sufficiency through Resource Development Renewable and Fossil
  • Cattaraugus wind turbine project
  • Repair and maintain NG distribution system and rectify NFG imbalance issues
  • Purchase of NG field or initiate E&P
  • Swab/maintenance on producing wells/Plug and abandon existing wells
  • 2MW solar feasibility study
  • Microgrid feasibility study
  • Continue energy efficiency improvements in new and existing facilities

• Create Rate Parity between the SNI Territories
  • Address electric rate inequalities through DG and control of distribution
PROJECT OBJECTIVES
1.8 MW Wind Turbine on Common Lands

- Design procure and install one wind turbine to be interconnected with NGRID
- Aggregate tribal load at SNI facilities in Cattaraugus served by NGRID
- Aggregated net metering and provide approximately 1.8 MW of wind power credit against SNI load
- Credit through net metering will create rate parity and savings to tribal members on the Cattaraugus Territory
- Seneca Energy will administer credit
The selected project team includes:

- Seneca Nation of Indians/Seneca Energy, LLC
- URS, Inc
- New West Technologies, LLC
- Sustainable Energy Developments, Inc.
- Whitman Osterman Hannah
PROJECT Highlights
Preconstruction Activities

- Site selection and control
- Permitting and Public Outreach
- Interconnection application
- Turbine selection, modeling and purchase agreement
- Aggregation of load for Net Metering
PROJECT Highlights
Site Selection and Control

- Evaluated several sites near Lake Erie for good wind resource
- Environmental and/or visual issues
- Three phase power with SNI load source
- SNI Common Lands
PROJECT Highlights
Permitting and Public Outreach

- FAA

- NEPA Environmental Assessment

- SNI SE is lead agency
  - EPD
  - THPO
  - Conservation
  - M&B’s
  - GIS
  - Natural Resource Comm.
PROJECT Highlights

Interconnection

- NGRID interconnect application
- NGRID sovereign immunity waiver language
- Interconnection process
Negotiating with GE and Vestas

Chosen site had lower winds but conservative modeling made sure output exceeded grant representations

Challenges ahead for negotiated term sheet
Wind Resource

- Original assessment based on a site close to Lake Erie was 7.13 m/s. Chosen site is 6.56 m/s. Output far exceeds initial model of 5,200 MWh based on either GE or Vestas turbine.

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Wind Turbine</th>
<th>Gross AEP</th>
<th>Net AEP</th>
<th>Capacity Factor</th>
<th>Mean Wind Speed at Hub Height</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>GE 1.7 – 80m Hub</td>
<td>6,639.8 MWh</td>
<td>6,142 MWh</td>
<td>41.2%</td>
<td>6.56 m/s (14.7 mph)</td>
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<tr>
<td>2</td>
<td>V100 – 80m Hub</td>
<td>6,790.4 MWh</td>
<td>6,281 MWh</td>
<td>35.8%</td>
<td>6.56 m/s (14.7 mph)</td>
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V-100 Power Curve

- Hub Height Average Wind Speed (m/s): 7.13
- Air Density Factor: 0.98
- Average Annual Power Output (kWh): 5,282,067
- Implied Capacity Factor: 33%
Aggregated Net Metering: Key to Community Energy

- Optimize location of the renewable resource
- Be able to aggregate load served in the same distribution territory
- Get a full net meter credit for displacement of all kWh
Aggregated Net Metering: Key to Community Energy

Revision #3

1. Monthly Credit verification and transfer
   - From 48 SN ELI grid electric accounts, verify that credit was received, verify amount and transfer the aggregated amount into Seneca Energy administrative account.

2. Create database of customers through sign-up of residential NSL accounts
   - SE estimates 1,572 households for a total number of grid electric accounts. Actual sign-ups showing electric bills will govern actual allocatees.

3. Extract 5% admin fee then allocate credit equally to all signed-up residential accounts

4. Verify that check and credits were received and applied properly

5. Generate and verify monthly list of accounts to be credited and obtain monthly requisition check

6. Obtain ACH verification and credit list from NSL accounting and file verification credit in database.

7. Upload .xls file to NSL accounting, alert NSL of current ACH amount available for monthly ACH withdrawal.
Aggregated Net Metering: Key to Community Energy

- Wind turbine will generate approx. 5 million kWh/yr.
- Net meter credit in National Grid Territory is 8¢
- Credit is $0.08 \times 5,000,000 = $400,000
- 48 Tribal Facilities use 10.5M kWh spending about $1M for a weighted average cost of 10¢ per kWh
- Expect to generate at least 40% savings
What to do with the Savings?

Seneca Energy is the SNI energy organization who facilitates DG, EE as well as distribution functions for NG and Electricity

- Cattaraugus members pay about 13¢ per kWh whereas Allegany members pay 5¢ per kWh

- Nation bills will be credited, Seneca Energy will allocate and distribute credit directly to SNI members

- dBase of members account info. and capacity building
Contacts

1.8 MW Wind Turbine on Common Lands

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