Oneida Nation

Building Audit Program and Energy Development Strategy

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DOE Tribal Energy Program
Denver, CO
11/14-18/2011
Talking Points

► History of Oneida’s efforts

► Energy Security Plan
  ▶ Residential
  ▶ Transportation
  ▶ Buildings and Operations
  ▶ Energy Development

► Building Audit Program

► Energy Optimization

► Partners
Changes to Oneida Territories in Wisconsin

Place Names on the Oneida Reservation

- Kabulosa
- Tekwaowonsa
- Kwenyouskal
- Tawoaunka
- Tenaunka

<table>
<thead>
<tr>
<th>Ojibwe Language</th>
<th>English Translation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kabulosa</td>
<td>go hanging up (as well)</td>
</tr>
<tr>
<td>Tekwaowonsa</td>
<td>the place of the original people (Settlement)</td>
</tr>
<tr>
<td>Kwenyouskal</td>
<td>next to the bend (in two)</td>
</tr>
<tr>
<td>Tawoaunka</td>
<td>the place of many oaks</td>
</tr>
<tr>
<td>Tenaunka</td>
<td>interred site</td>
</tr>
<tr>
<td>Tekwaowonsa</td>
<td>the place of many oaks - where going (see map)</td>
</tr>
</tbody>
</table>

Legend:
- Green: Monroe / Oneida Territory - 1832
- Orange: Oneida Territory - 1851
- Purple: Ojibwe Territory - 1868
- Light Orange: Approximately 80 Thousand Acres
- Yellow: Approximately 80 Thousand Acres
- Dark Purple: Place Names on the Oneida Reservation
- Blue: Indian Reservation Line (1852)
- Pink: Indian Reservation Line (1854)
- Brown: Indian Reservation Line (1858)

States of Michigan

Lake Superior
1995 to 2002

- 13 kw photovoltaics
- 16 residential solar hot water systems
- Demonstration trailer
- Solar thermal greenhouse

Lessons

- Maintenance
- Maintenance
- Maintenance
- Total impact
- Buy in
Since 2002

► Oneida Energy Team established
► Wind Assessments
► Wind Study
► Solar Hot Water Training
► Inspection and Maintenance Program
► Food Distribution PV System in WE Energies Buy-Back Program
► Grant Research (DOE, BIA, USDA)
► Ground-source thermal experiment
► OHA, DOLM and DPW energy efficiency
► ORCCC Solar Thermal System
Energy Security Plan

► Collaboration between Oneida departments - The value of cross-functional teams!

► Energy Security Plan
  ◆ Transportation
  ◆ Residential
  ◆ Buildings and Operations
  ◆ Energy Optimization

► Energy Action Plan

► Business Committee, General Tribal Council
EECBG projects

A) $247,000 for Electrician, Lighting upgrades

B) Solar thermal on Elder Service Center

C) Residential energy audits
Prius Pilot
Oneida Energy Costs

- Residential: $5M
- Commercial: $3M
- Transportation: $0.5M

12/8/2011
Residential Assistance:
Oneida Housing Authority and Dept. of Land Management

▶ OHA
- ARRA funds for rehab of 132 rental units
- New housing developments
- Home audit training
- Solar hot water

▶ Land Management
- Upgrades to Dream Homes
- Solar hot water
2009 Consumption

- Total Cost = $3.4 Million

- Electric Consumption - 72% of total cost
  - buildings, structures, signs, fields, street lighting

- Natural Gas Consumption - 27% of cost
  - 99% of buildings on N.G. (low cost for now)

- 56,585,953 lbs of CO2
Radisson Hotel

Lighting
Ozone laundry
Heat recovery

12/8/2011
where is it?
ENERGY DEPLOYMENT
DOE Energy Efficiency Development and Deployment grant

- Energy Deployment grant for 44 building audits.

- Database of buildings prioritized based on size, age, and known energy concerns

- Oneida Energy Controls Manager working with team to draft RFP for selecting consultant

- RFP modeled on the Wisconsin Focus on Energy program Conservation Feasibility Study Guidelines
DOE Energy Efficiency Development and Deployment grant

- Consultant to perform audits and submit reports/feasibility studies

- Recommendations will be used for budgeting tribal funds, capital expenditures, and applications for future grant funding

- Oneida Energy Team and Business Committee to be kept informed on progress
Energy Optimization

Energy Portfolio Development
More Lessons

► Just because you build it doesn’t mean they’ll really come; Make sure everyone is on board, including end-users.

► Buyer Beware!

► Design a program that is devoted to installing AND maintaining systems.

► Can’t rely on Programs.

► Education intensity will make or break a good idea.

► Supply and Demand too.
Oneida Reservation

- 96 square miles = 61,440 acres
- ~ 80% agriculture
- West is rural
- Northeast is suburban
- Southeast is rural/suburban
- Oneida farms manage 5,000+ acres
- Oneida leases 5,000+ acres

- 2009 Live, Sustain, Grow survey:
  - ~ 5,000 Tribal members live in region
  - 68% use N.G. for heat
  - 49% use electricity for heat
  - 16% use firewood for heat
  - 13% use L.P. for heat
  - 1% use oil for heat
- 10-20% do or will use wood
- 70+% support alternative fuels
Monthly Wisconsin Price of Natural Gas Delivered to Residential Consumers

Source: U.S. Energy Information Administration
100% of energy is imported into Reservation (two public utilities: WE and WPS)

Natural gas prices are unstable; electricity costs are rising $0.01-$0.2 / yr.

No local tap (some Tribes have access to reserves, most don’t)

Climate change and carbon matters

Land is our greatest asset

Oneida is an agricultural community

Energy is sovereignty
Bioenergy is likely the only energy source that will allow Oneida to establish a renewable portfolio that exceeds 25, 50, or 75% in _____ years.

Gasification project is in pilot stage

Woody biomass is a popular source; Grass biomass has potential

Market analysis will gage local and regional interest

The technology and infrastructure are at various stages in development

The path must be economical, sustainable
Oneida Energy Development Program Vision

- Energy Interdependence
- Community Partnership
- Economic Development
- Job Creation (thanks to bioenergy)
- Sustainable Energy (economical & environmental)
- Tribal Sovereignty
South and West shown to have the best wind.
Wind Monitoring Tower

where is it?
General Wind Resource Review

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February 16, 2010
Oneida Recycling Solutions

Oneida - Kodiak
Construction Services
Objectives

- Energy profile
- Community profile
- Forecast
- Feasibility for available energy technologies
  - Wind, solar, ground thermal, bioenergy
- Market analysis
- Energy Optimization Model
- Energy Portfolio
First Steps Action Plan

Resources
► Solar
  ◄ Thermal
  ◄ Electric
► Wind electric
► Ground-source thermal
► Bioenergy
  ◄ Thermal
  ◄ Electric
  ◄ Fuels
► Hydropower
► CNG, biodiesel, electric

Strategy
► Energy history
► Energy forecast
  ◄ Community needs
► Resource feasibility
► Technology research
► Energy Portfolio
► Organizational development
  ◄ Website development
  ◄ Facility planning
Benefits of an Energy Crop

- Old technology improved
- Flexible fuel
- Local production
- On-site production
- On-site uses
- Agriculture crop
- Existing equipment

- 80% efficient
- Local process
- Job creation
- Economic Dev
- Water quality
- Habitat
- Ground cover
The Bioenergy seed...

- Currently, OCC delivers wood to elders and others on a weekly basis.
- The wood source is from harvesting hazard trees in neighborhoods.
- Deliver 250-280 face-cords per year (80-90 full-cords producing 1,785 MMBtu heats 15-20 homes; based on 100 MMBtu/home/heating season).
- Can Oneida convert a percentage of their cropland into an energy crop, pellet the crop, and distribute the pellets to members?
- 1-5 acres/home/year for heating.
Regional examples

Midwest Biomass Conference
► Europe is decades ahead of us
► District Energy in St Paul
► Show Me Energy in Missouri
► Biomass Thermal Energy Council
► Field plots in SW WI (RC&D, UW-Mad)
► Switchgrass, Miscanthus, others

Other examples
► Bad River Tribe biomass plant
► Potowatomi combined heat and power biomass facility
https://flowcharts.llnl.gov (Lawrence Livermore National Laboratory)
Biomass challenges

- 20 - 50 miles of source
- Specific growing characteristics depending on the variety
- Grass biomass can be pelleted, briquetted, etc.; local processing requires capital
- Stoves need to be designed for ash content
- Can we incorporate CHP into Tribal buildings and residences?
- Is a bio-fuel an option
- In regions of WI, production must exceed 5 tons/acre (70 M MBtu) to be economical (preliminary data)
- Cheap and easy heat and electricity (BTEC webinar)
Bioenergy Strategy

**Action Plan**
- Organize work team
- List partners
- Determine scope of work
- Determine available funding
- Develop budget
- Develop marketing work plan
- Develop test plot work plan
- Pilot Study

**Test Plot Work Plan**
- Locate field plots
- Mobilize labor and equipment
- Determine field prep needs
- Determine seed mix choices
- Develop timeline
- Staging area
- Material management
- Demonstration project
- 2011 field season
Thank you Partners!

DOE, BIA, USDA
Focus on Energy
Utilities: WE, WPS
WDNR
UWGB, UW-Madison
BTEC
RC&D
WTCAC
Questions

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