



Oneida Nation

Building Audit Program and Energy Development Strategy

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Oneida Environmental Health and Safety Division

DOE Tribal Energy Program

Denver, CO

11/14-18/2011

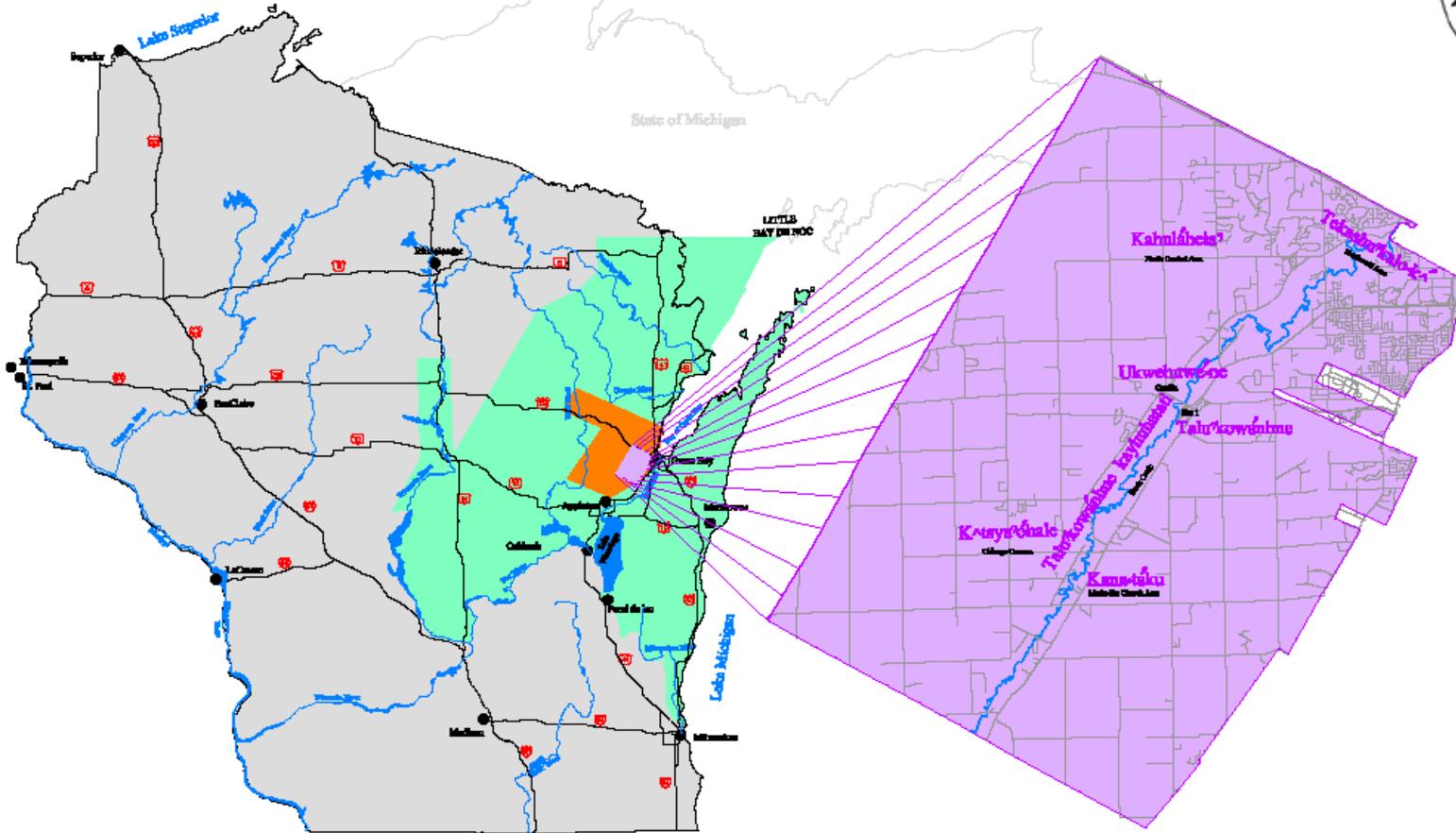


Talking Points

- ▶ **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



- Menominee / Oneida Territory - 1822
Approximately 3 Million Acres
- Oneida Territory - 1821
Approximately 800 Thousand Acres
- Oneida Territory - 1828
Approximately 15 Thousand Acres

<u>Oneida Language</u>	<u>English Translation</u>
Kahnikshah	the place of the original people (Indigenous)
Ukweshwene	the place of many storks
Kahk'owwabe	the place of many storks
Kanyshale	the place of many storks
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GEOGRAPHIC LAND INFORMATION SYSTEMS
 700 Parkland Dr.
 Oneida, WI 54981
 (920) 495-2097
 Internet Use Only
 DATE: 12/8/01



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**



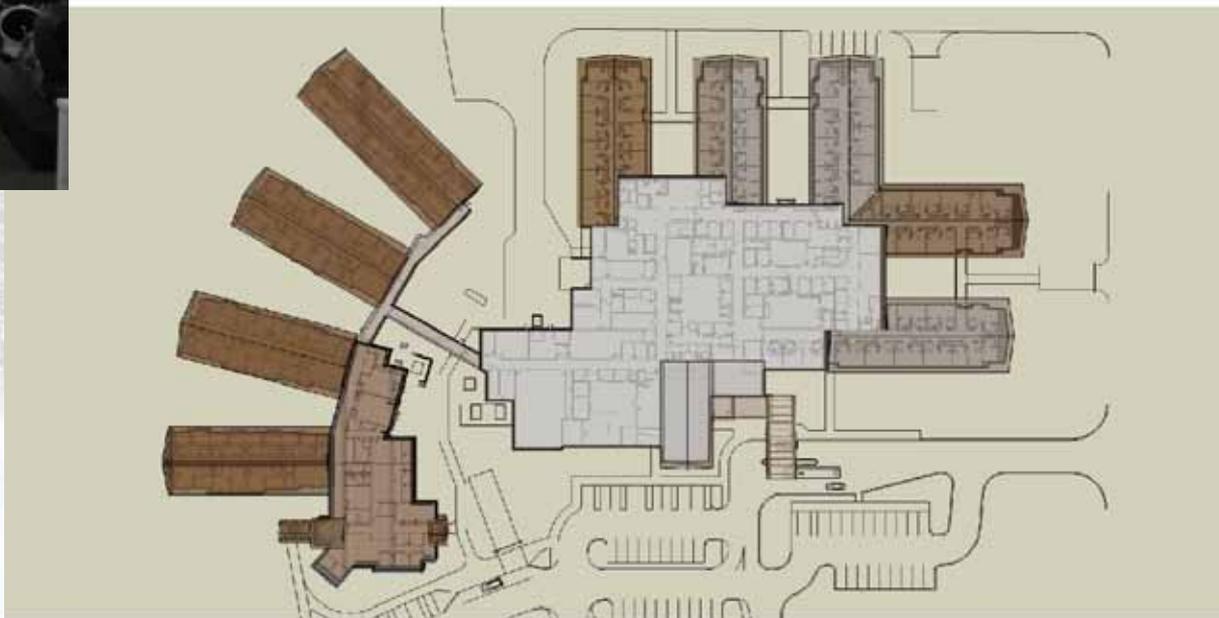
EECBG projects



A) \$247,000 for Electrician,
Lighting upgrades

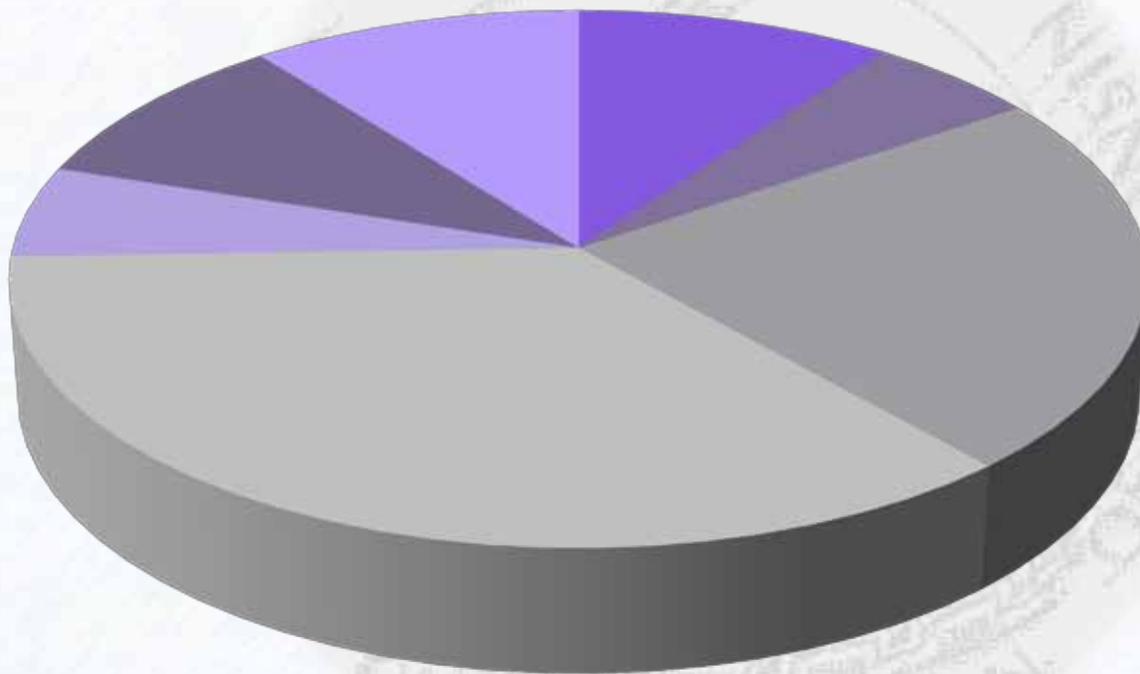
B) Solar thermal on
Elder Service Center

C) Residential
energy audits





Oneida Transportation



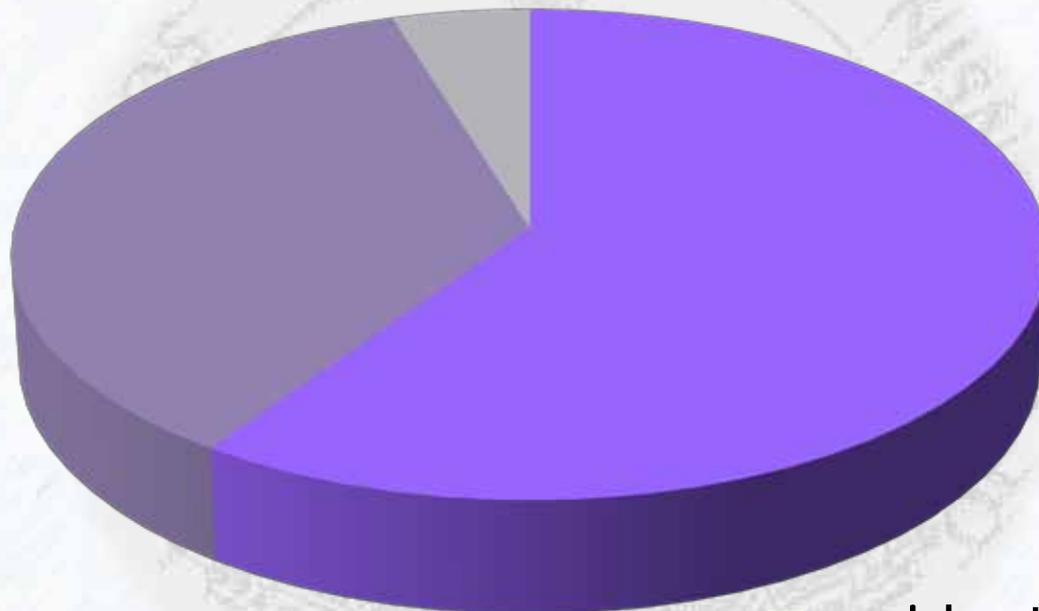
- small utility
- minivans
- vans
- trucks
- SUVs
- cars
- other

Prius Pilot





Oneida Energy Costs



■ residential	\$5M
■ commercial	\$3M
■ transportation	\$0.5M

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

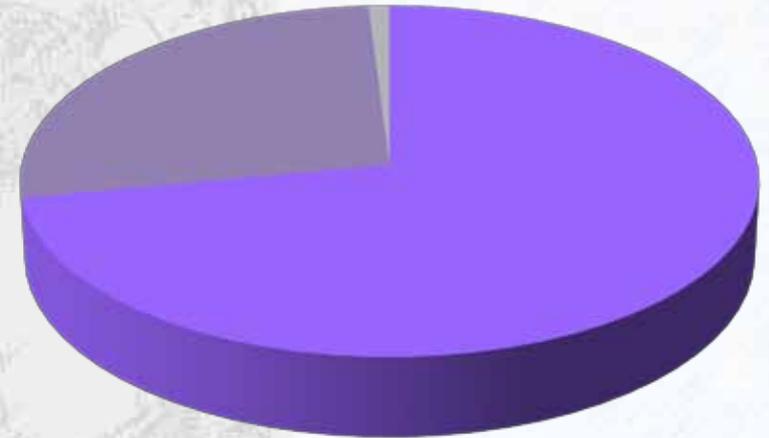
- § Upgrades to Dream Homes
- § Solar hot water



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)**



■ electric
■ natural gas
■ propane

- ▶ **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.

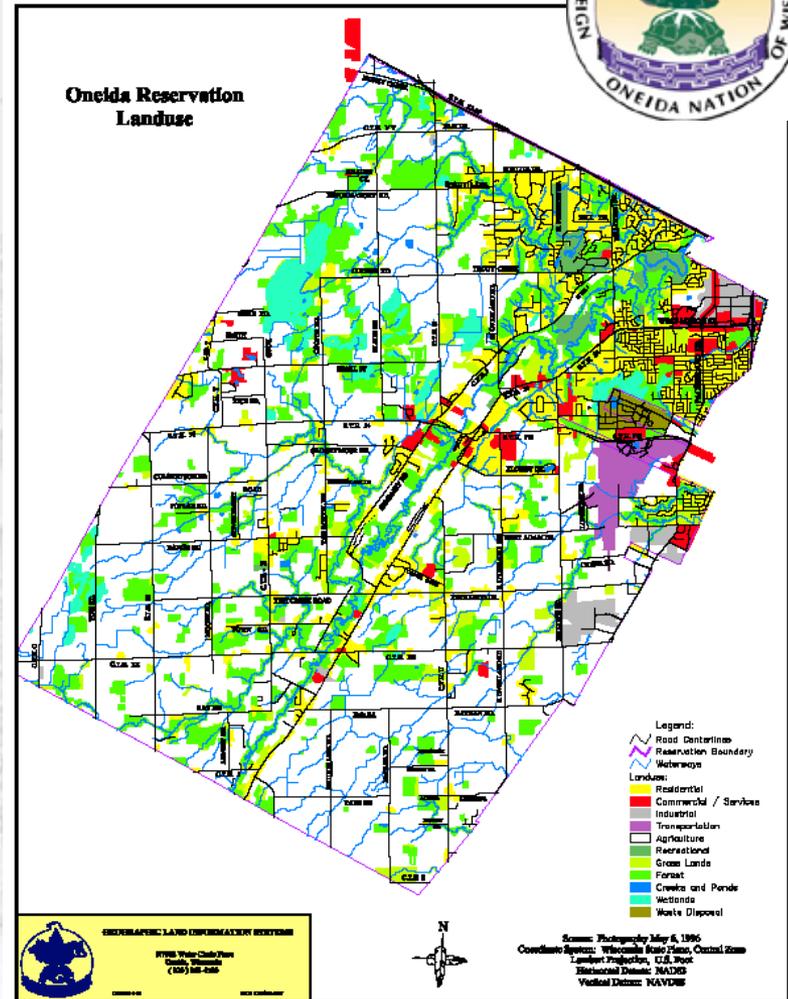
Oneida Reservation



- ▶ 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

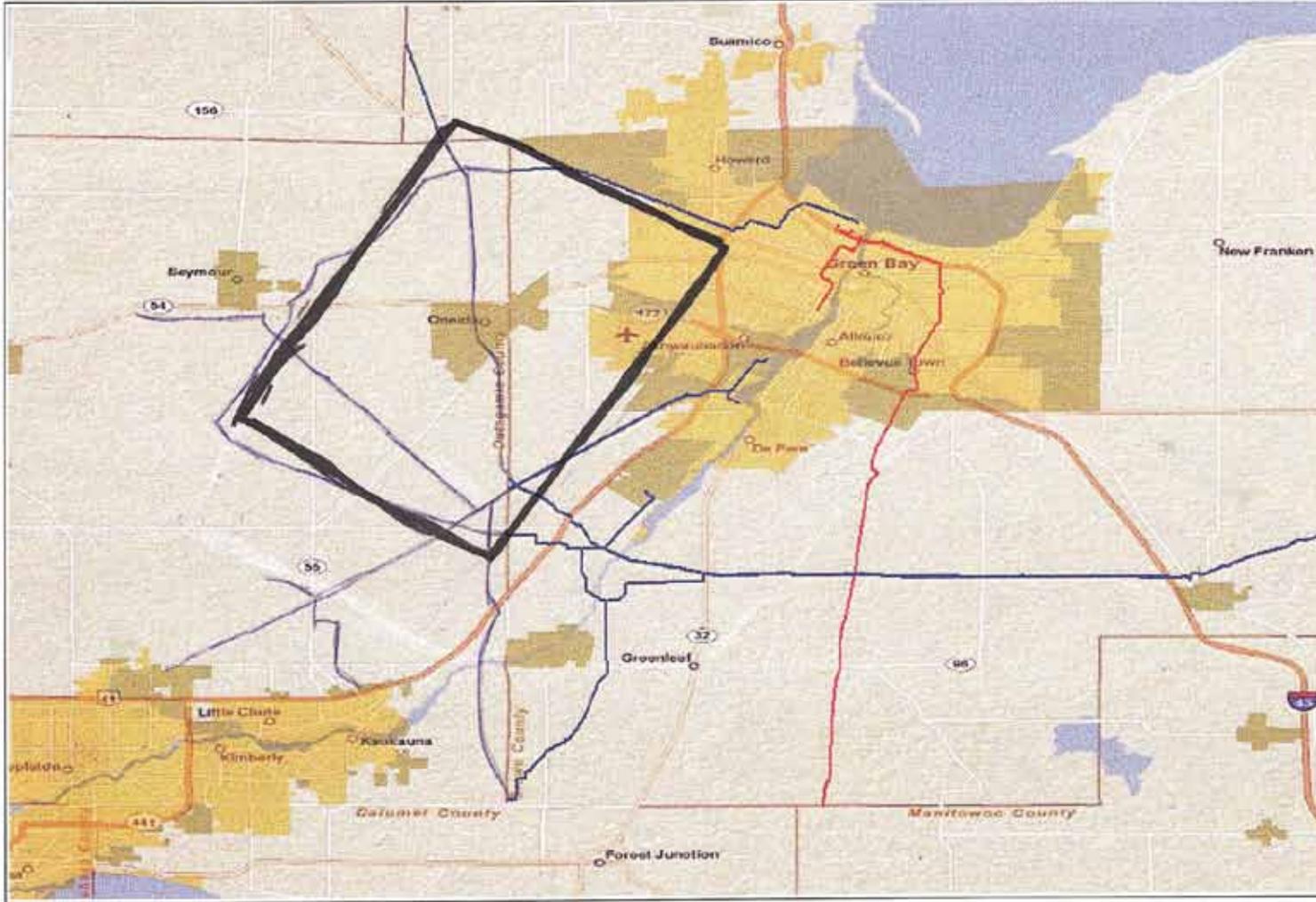
- ▶ 2009 Live, Sustain, Grow survey:
- ▶ ~ 5,000 Tribal members live in region
- ▶ 68% use N.G. for heat
- ▶ 49%??? use electricity for heat
- ▶ 16% use firewood for heat
- ▶ 13% use L.P. for heat
- ▶ 1% use oil for heat

- ▶ 10-20% do or will use wood
- ▶ 70+% support alternative fuels



where is it?

NATIONAL PIPELINE MAPPING SYSTEM



Legend

- Gas Transmission Pipelines
- Hazardous Liquid Pipelines
- LNG Plants
- Breakout Tanks
- Other Populated Areas
- Highly Populated Areas

Pipelines depicted on this map represent gas transmission and hazardous liquid lines only. Gas gathering and gas distribution systems are not represented.

This map should never be used as a substitute for contacting a one-call center prior to excavation activities. Please call 811 before any digging occurs.

Questions regarding this map or its contents can be directed to npms-er@mbakercorp.com.

Projection: Geographic

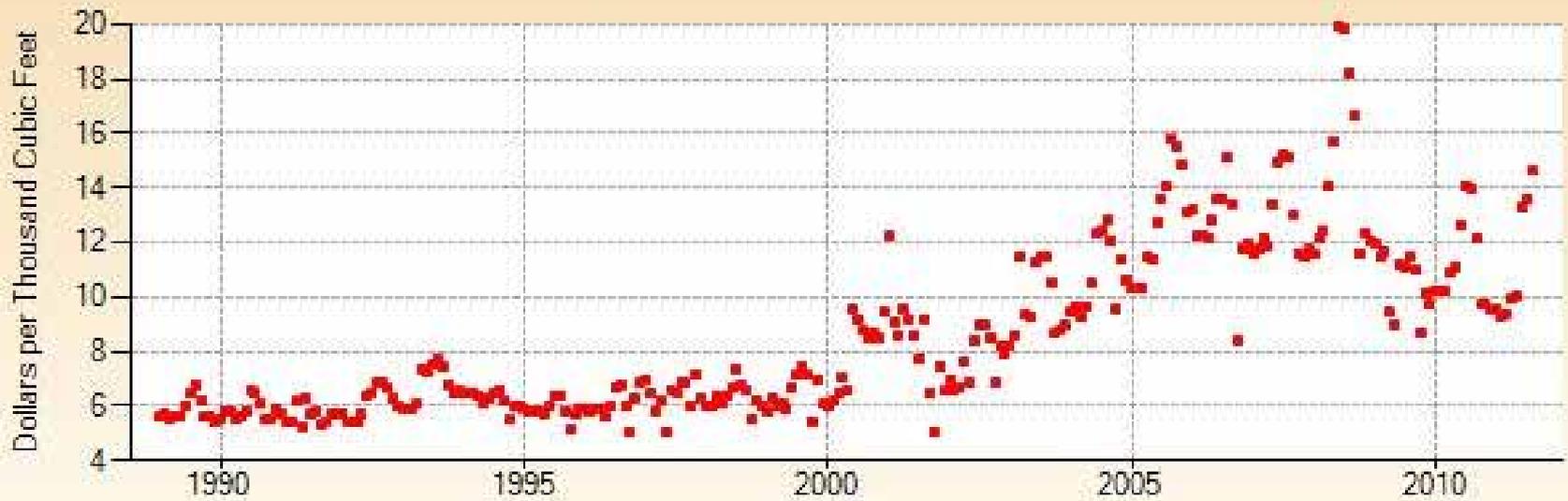
Datum: NAD83

Map produced by the NPMS Public Viewer at www.npms.phmsa.dot.gov

Date Printed: Nov 10, 2011



Monthly Wisconsin Price of Natural Gas Delivered to Residential Consumers



Source: U.S. Energy Information Administration



Tribal Energy Considerations



- ▶ 100% of energy is imported into Reservation (two public utilities: WE and WPS)
- ▶ **N.G. 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

Tribal Energy Considerations

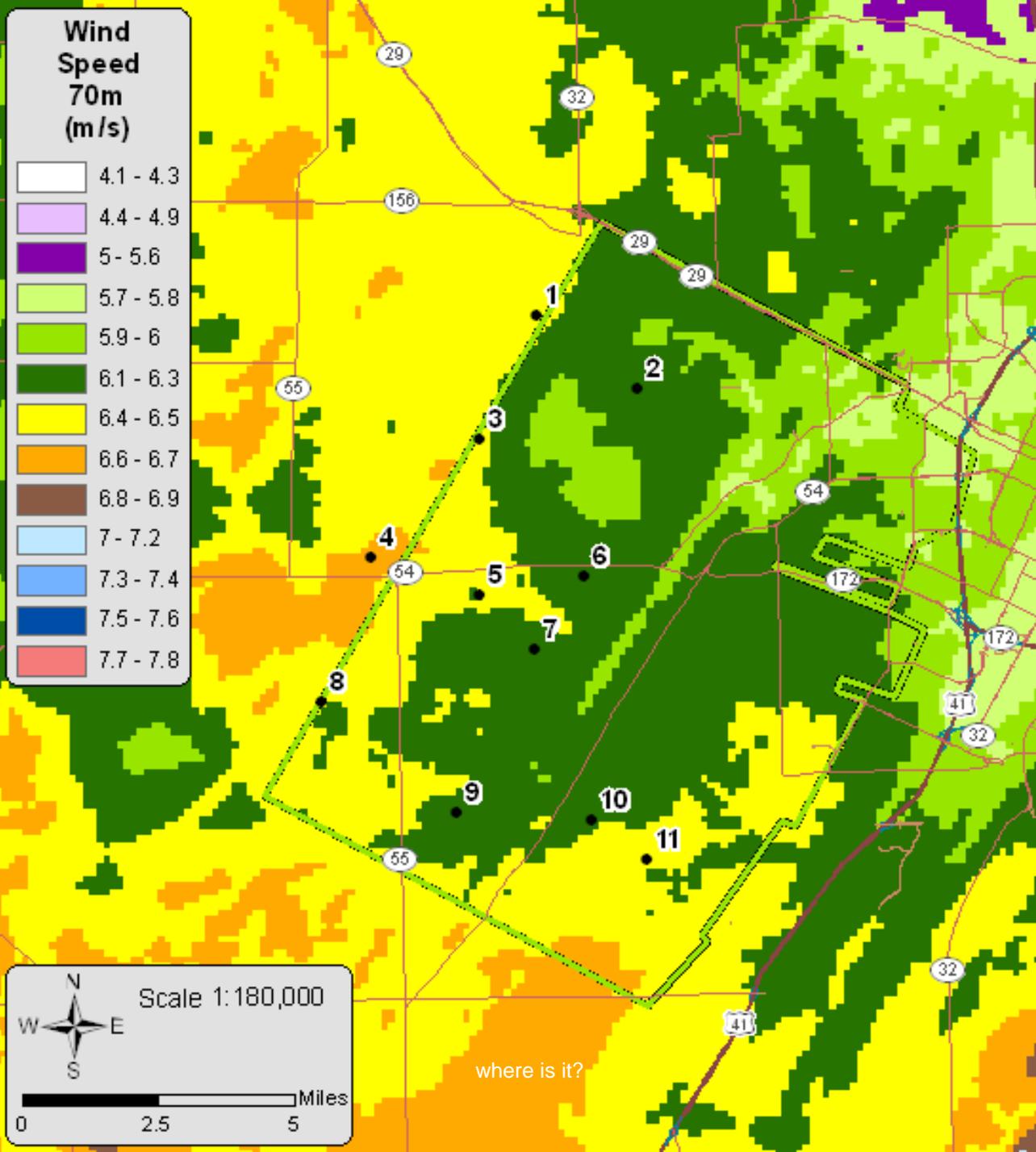


- ▶ **Bioenergy is likely the only energy source that will allow Oneida to establish a renewable portfolio that exceeds 25, 50, or 75% in _____ years.**
- ▶ Gasification project is in pilot stage
- ▶ Woody biomass is a popular source; Grass biomass has potential
- ▶ Market analysis will gage local and 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

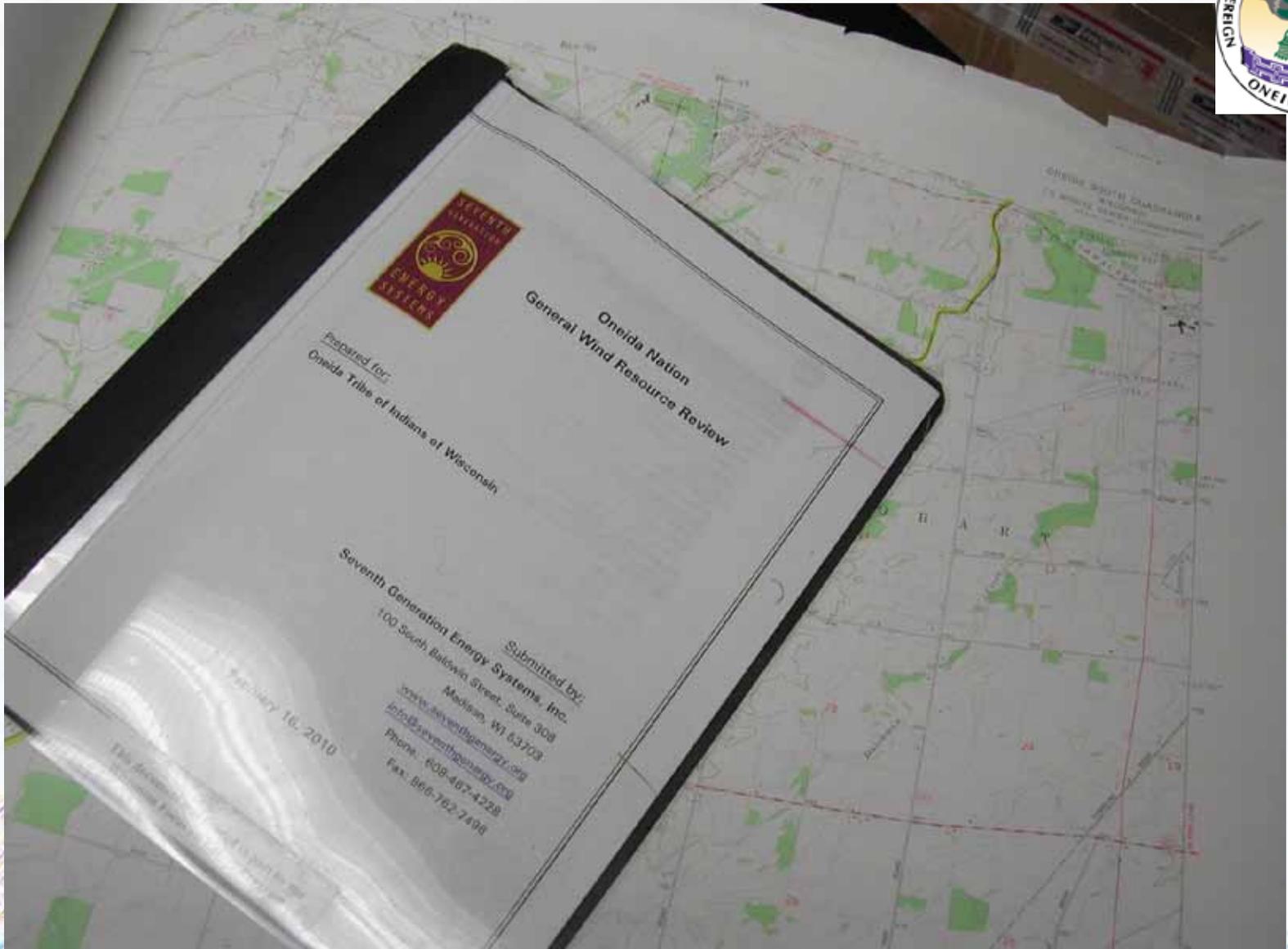
where is it?

12/8/2011

25

Wind Monitoring Tower





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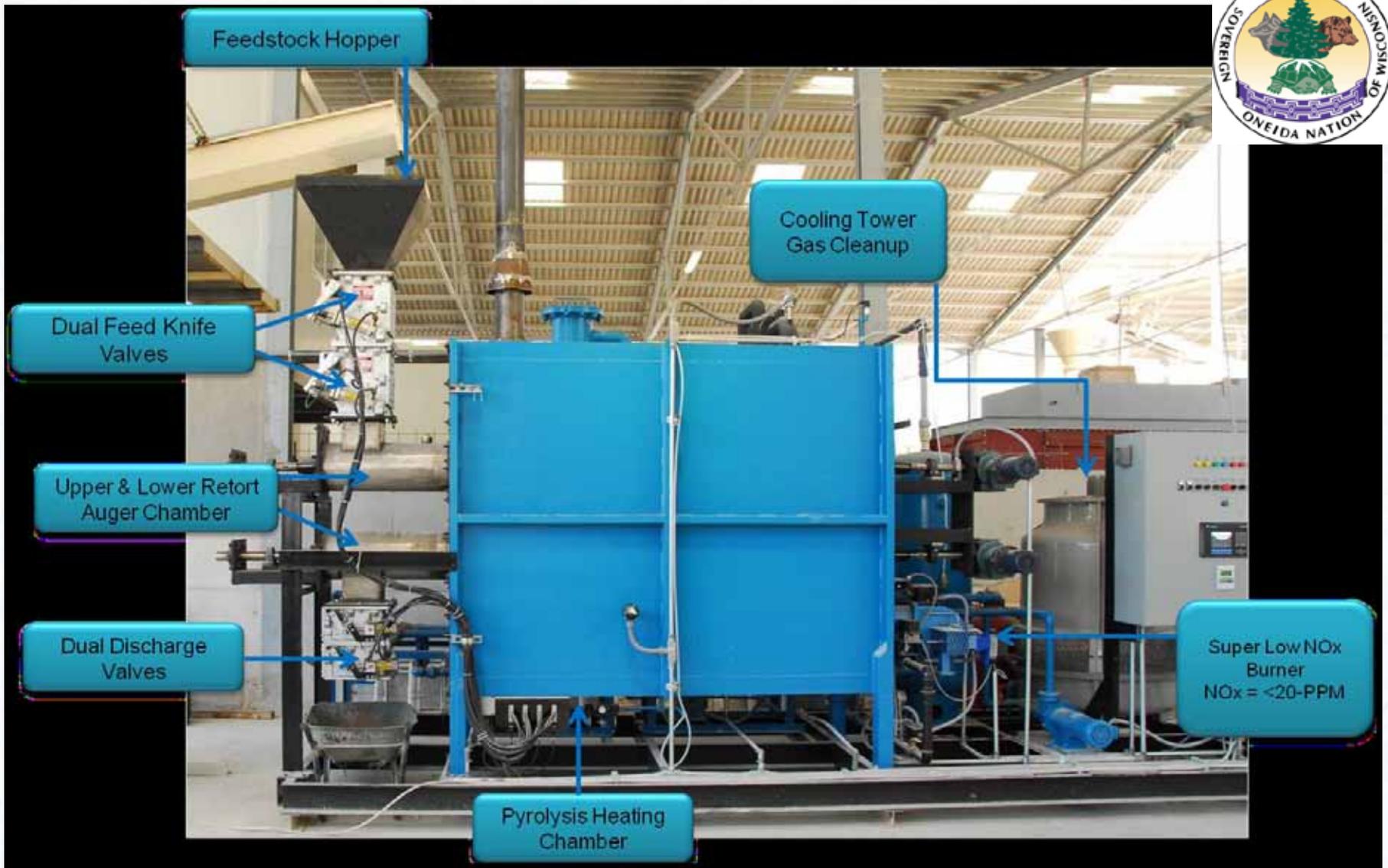
where is it?

25

Oneida Recycling Solutions



 **Oneida - Kodiak**
Construction Services



Department of Energy grant



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

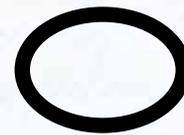
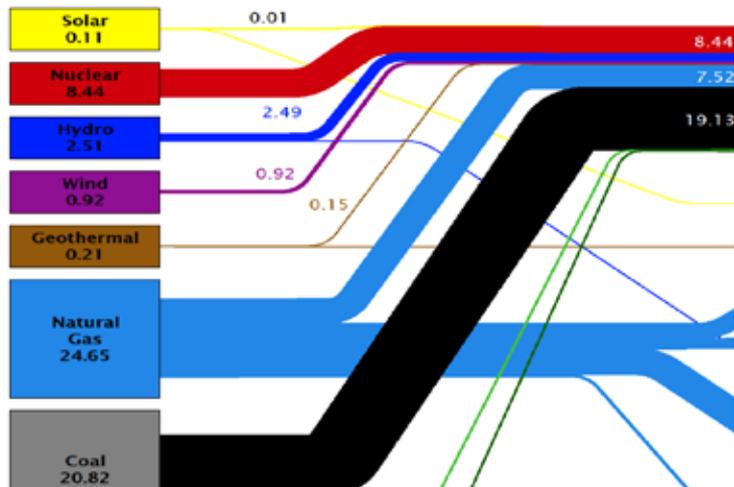
- ▶ Europe is decades ahead of us
- ▶ District Energy in St Paul
- ▶ Show Me Energy in Missouri
- ▶ Biomass Thermal Energy Council
- ▶ Field plots in SW WI (RC&D, UW-Mad)
- ▶ Switchgrass, Miscanthus, others

Other examples

- ▶ Bad River Tribe biomass plant
- ▶ Potawatomi combined heat and power biomass facility



Estimated U.S.



<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 MMBtu) 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
- ▶ Develop manufacturing 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

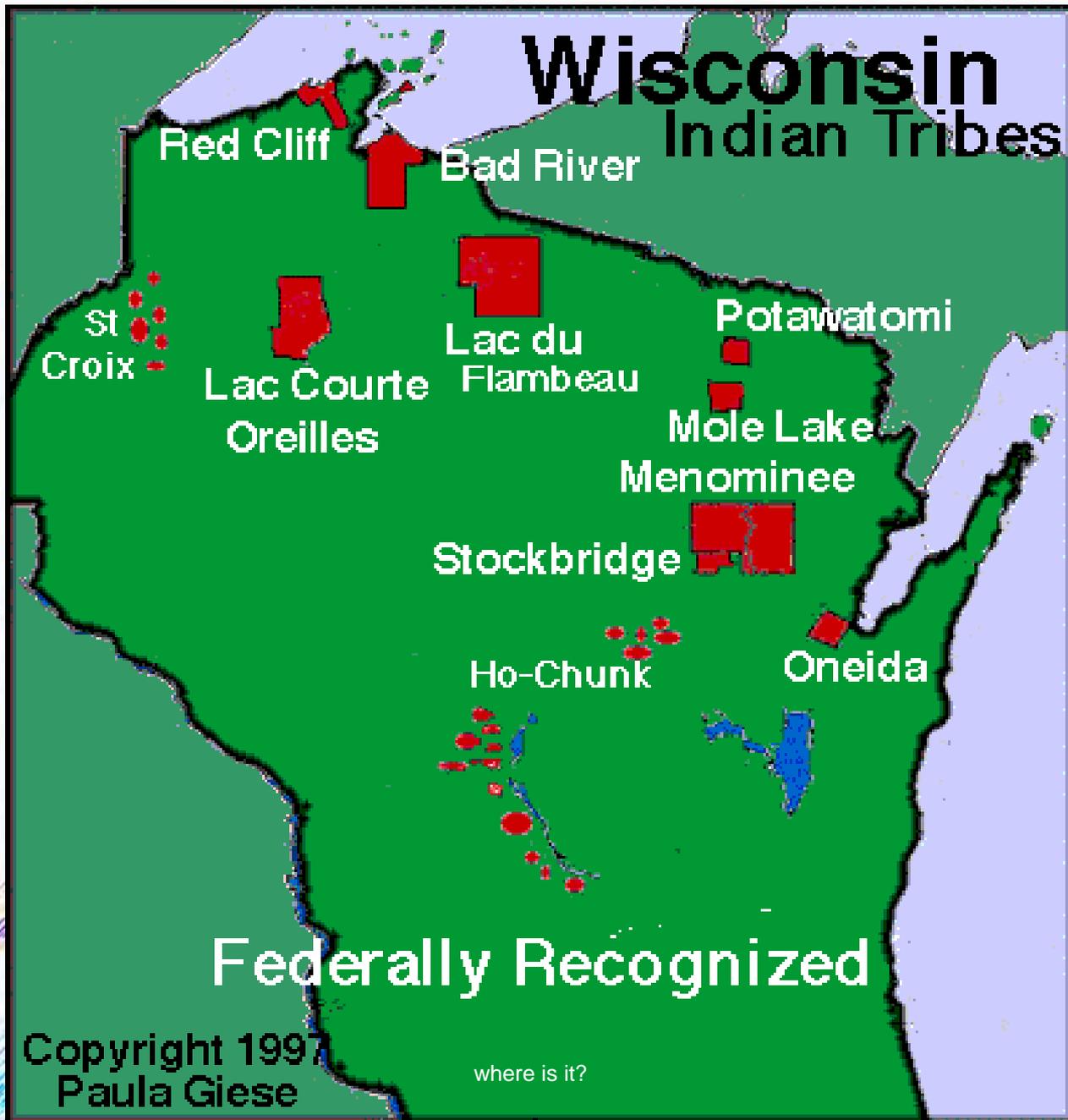
WDNR

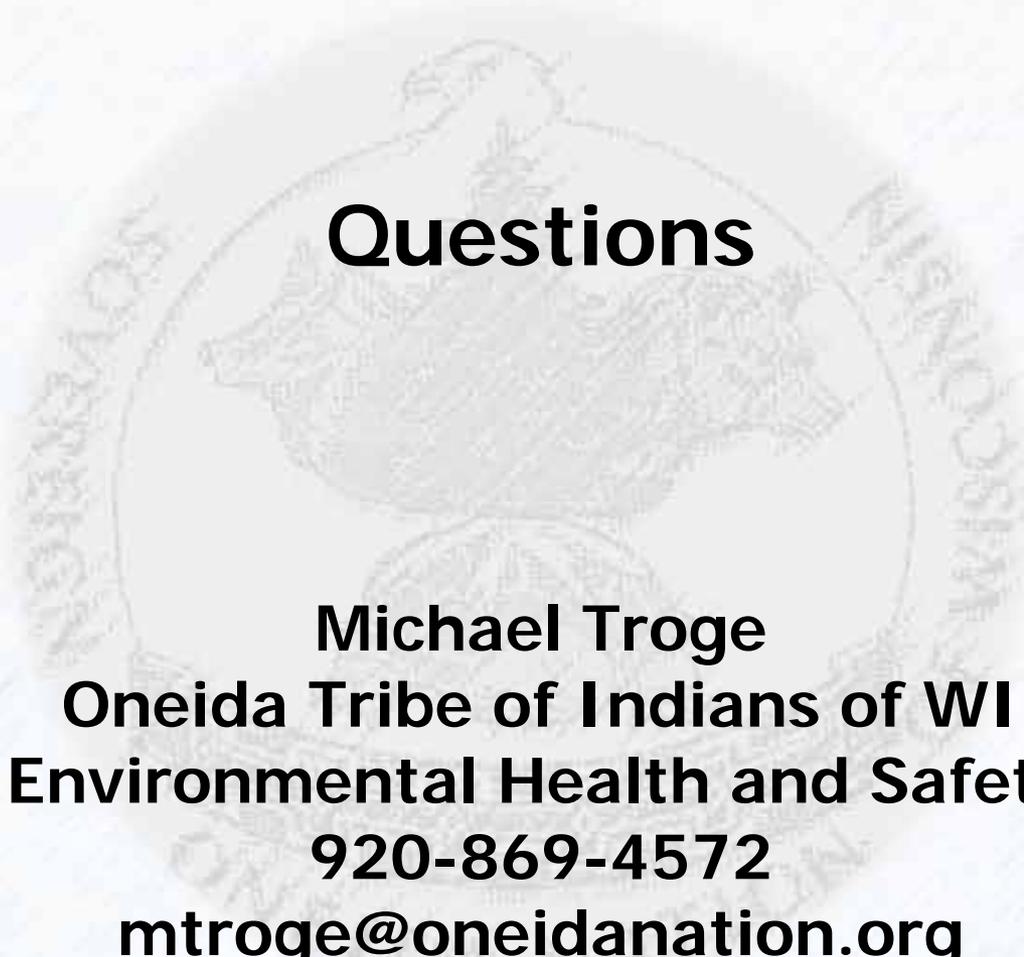
UWGB, UW-Madison

BTEC

RC&D

WTCAC





Questions

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