



Pawnee Nation of Oklahoma DOE First Steps Project

DOE Tribal Program Review

November 20, 2008

Overview of Presentation

- Background
- Project Objectives
- Activities Performed
- Renewable Energy Resource Development Opportunities
- Electric Utility Options
- Energy Efficiency Opportunities
- Key Findings and Recommendations

Background

- Land:
 - Tribe-owned lands checker-board within the boundaries
- Existing Buildings:
 - Limited housing exists on tribal lands. Housing was built in 1950s.
 - ~18 tribe-owned non-residential buildings, several historic
- New Construction: Chilocco casino, and several renovations on the campus
- Served by multiple electric utilities and utilize natural gas for heating; have good working relationships, though concerned about rising prices

Pawnee Nation Strategic Energy Plan

- Energy Planning Session held with Council of Energy Resource Tribes (CERT) Fall, 2003
- Tribal leaders, program managers and staff of Pawnee Nation developed energy plan looking ahead to 2013
- Developed six point vision for the future

Six Point Vision for the Future

- Operating Viable Energy Enterprise
- Producing Environmentally Friendly Energy
- Comprehensive Energy Resources Management
- Ongoing Expansion of Career Opportunities
- Aggressive Energy Efficient Housing Program
- Assuring an Enhanced Lifestyle

First Steps Project Goals

- Assure future energy resource development reflects Pawnee values.
- Assess demand and supply-side energy resources
- Provide information necessary to prioritize / screen opportunities
- Identify infrastructure needs
- Establish participatory decision-making process
- Define specific objectives and progress indicators
- Ensure Tribal members receive training needed to carry out energy initiatives.
- Provide tools necessary to pursue “best fit” options

Activities Performed

- Reviewed potential **renewable energy applications** and funding sources
- Reviewed opportunities for cost savings through electric **utility options**
- Also provided overview of current and future electric demand, and outlined energy efficiency options

Renewable Energy Applications

- Biomass Resources
- Solar Resources
- Wind Resources
- Hydroelectric Resources

Pawnee Biomass Resource

- Notable resources:
 - Red Cedar: Considered invasive & fire hazard, currently being burned
 - Underutilized Croplands
- Heating for non-residential buildings on Campus
 - Next steps: Complete comprehensive economic feasibility analysis and identify funding mechanism.
- Agricultural biomass holds great promise in next decade.
 - Substantial amount of underutilized cropland available.
 - Growth in biofuel demand over next decade may warrant sale of energy crops to biofuel refinery.
 - Next steps: Monitor biofuel market development, attend trade shows, establish communications with Oklahoma's Bioenergy Center.

Pawnee Solar Development Potential

- Solar resource slightly above national average
- Photovoltaics (PV)
 - Strong technical potential, but not cost-effective given lack of financial incentives.
 - 5 kW system, -\$31,000 net present value, >25 year simple payback.
 - Tribe looking into installing Solar panels on Security lights and Parking Lot lighting.
 - Next step: determine level of commitment to PV and whether want to pursue financing
- Solar Hot Water
 - Cost effective for gym
 - ~5-7 year payback
 - Next step: contact vendors, obtain buy-in from tribal decision-makers, determine funding approach (finance v. upfront payment)

Pawnee Wind Development Potential

- Resource not sufficient to support large-scale wind
- Small wind not economically feasible due to:
 - poor resource,
 - lack of good sites for net-metering, and
 - lack of financial incentives
- Small wind simple payback ~25-30 years.
- Next steps:
 - Small wind: Possible demonstration project if ID good net metering opportunity (i.e. purchase land around travel plaza), measure resource in target location, seek subsidized financing package.
 - Explore Chilocco site development potential in collaboration with other tribes.

Pawnee Hydro Development Potential

- Microhydro or “low power” conventional hydro potential
- Data show limited resource on reservation property.
- Pawnee Nation representatives report lower resource than indicated by data.
- Further pursuit of small hydro development not recommended.
- Cimarron / Arkansas Rivers border reservation and could hold large scale hydro potential. Review was outside scope of this project.

Electric Utility Option Review

- Background and Framework
 - Seven service providers in Oklahoma. Currently purchase from City of Pawnee.
- Electric Utility Assessment Data
 - Rates were compared from different providers.
- Electric Utility Service Options
 - Consider business as usual or purchase direct or negotiate lower rates from current supplier

Key Drivers for Direct Purchase Decision

- Existing Tribal Utility Commission
- Proximity to transmission system
- Proximity to existing substation/cost of lines to serve Pawnee
- Cost of new substation on Pawnee reservation
- Wholesale supply options

Energy Efficiency

- Implement simple efficiency measures in non-residential buildings, focusing on building envelope and use of high efficiency equipment.
- Adopt Energy Code (ASHRAE 90.1 or Int'l Energy Code) to improve efficiency of new buildings.
- Specific recommendations provided.

Overall Findings and Recommendations

- Limited Renewable Energy development opportunities.
 - Utility Issues - Monitor future market potential for bioenergy, conduct more detailed feasibility study.
 - Pursue wood-fired space heating at admin building, and solar hot water at gym.
 - Explore wind development activities at Chilocco School site.
 - Explore solar power for security and parking lot lighting.
 - Multiple options depending on Pawnee's relationship with the City; interest/ability to acquire and operate an electric utility; and ability to reduce current electric usage

Overall Findings and Recommendations

- Energy Efficiency:
 - Adopt Energy Code
 - Implement cost-effective improvements at existing buildings
- Other:
 - Consider establishing energy services business to complete on-going tribal energy improvements, leverage USDA funding, build tribal employment opportunities, educate and train tribe members on energy issues.



Questions?

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