

DOE OFFICE OF INDIAN ENERGY

Pathways to Sustained Energy Development in Oklahoma

Oklahoma Tribal Leader Forum – August 2012
Oklahoma City, Oklahoma



U.S. DEPARTMENT OF
ENERGY

Office of
Indian Energy

Office of Indian Energy

Goals and Objectives

- Promote Indian tribal energy development, efficiency and use
- Reduce or stabilize energy costs
- Enhance and strengthen Indian tribal energy and economic infrastructure relating to natural resource development and electrification
- Bring electrical power and service to Indian land and the homes of tribal members

Energy Policy Act of 2005, Title V, Sec. 502



Office of Indian Energy Programs

- **START (Strategic Technical Assistance Response Teams)**
 - Providing Expert Development Technical Assistance Directly to Tribal Staff/Leaders/Projects
 - Targeted energy development assistance – *post feasibility & pre construction/finance*
 - Innovative and hybrid solutions to tribal community-scale energy
- **Indian Country Energy & Infrastructure Work Group**
- **Transmission Planning and Capacity Building Collaborations**
- **Technical Training (Capacity Building) and Best Practices Forums**
 - Tribal leader renewable energy development and finance primer series
 - Tribal executive workshop on renewable energy financing
 - Best practices forums planned for 2011-2012 related to energy development and financing in Indian Country

DOE Programs

- Tribal Energy Program
 - Grant program for energy planning, resource assessments, feasibility studies, pre-development, small-scale deployment, energy efficiency
 - Technical assistance
- Weatherization Assistance Program
 - Enables low-income families, including tribal members, to permanently reduce their energy bills by making their homes more energy efficient.
 - Tribes eligible for direct funding (2 tribes, 1 inter-tribal org)
- Renewable Energy Commercialization
 - Technical Assistance Program
 - Solar Communities
 - Wind Powering America

■ Energy Policy and Planning: Begin at the Beginning

- Policy drivers create motivation and context for specific energy projects
- Planning creates consensus, context and comfort with pursuing specific energy projects



Indian Energy Policy Considerations

- Key Obstacles to Energy Development
- Key Strategic Growth Opportunities
- Key Tribal Priorities

■ Tribal Policy Considerations

- Workforce development and jobs
- Local energy resources
- Local energy uses (government buildings, casinos/hotels/commercial, community buildings, housing)
- Local energy market (wholesale, retail cost of electricity, buyers, transmission, federal and state incentives)
- Future energy issues – sources, transmission, cost. Load growth
- Taxation and regulation

■ Key Obstacles to Energy Development

- Funding, Financing, and Incentives
- Cost to develop and build
- Transmission / Grid access
- Buyers
- Permitting, lease approval turnaround time
- Energy education and capacity building

■ Key Strategic Opportunities

- Energy efficiency
- Distributed generation and regional/micro grids
- Community and facility scale deployment
- Expanded marketplaces (federal, large energy users)
- Energy sector opportunities
- Innovative project and financial structures



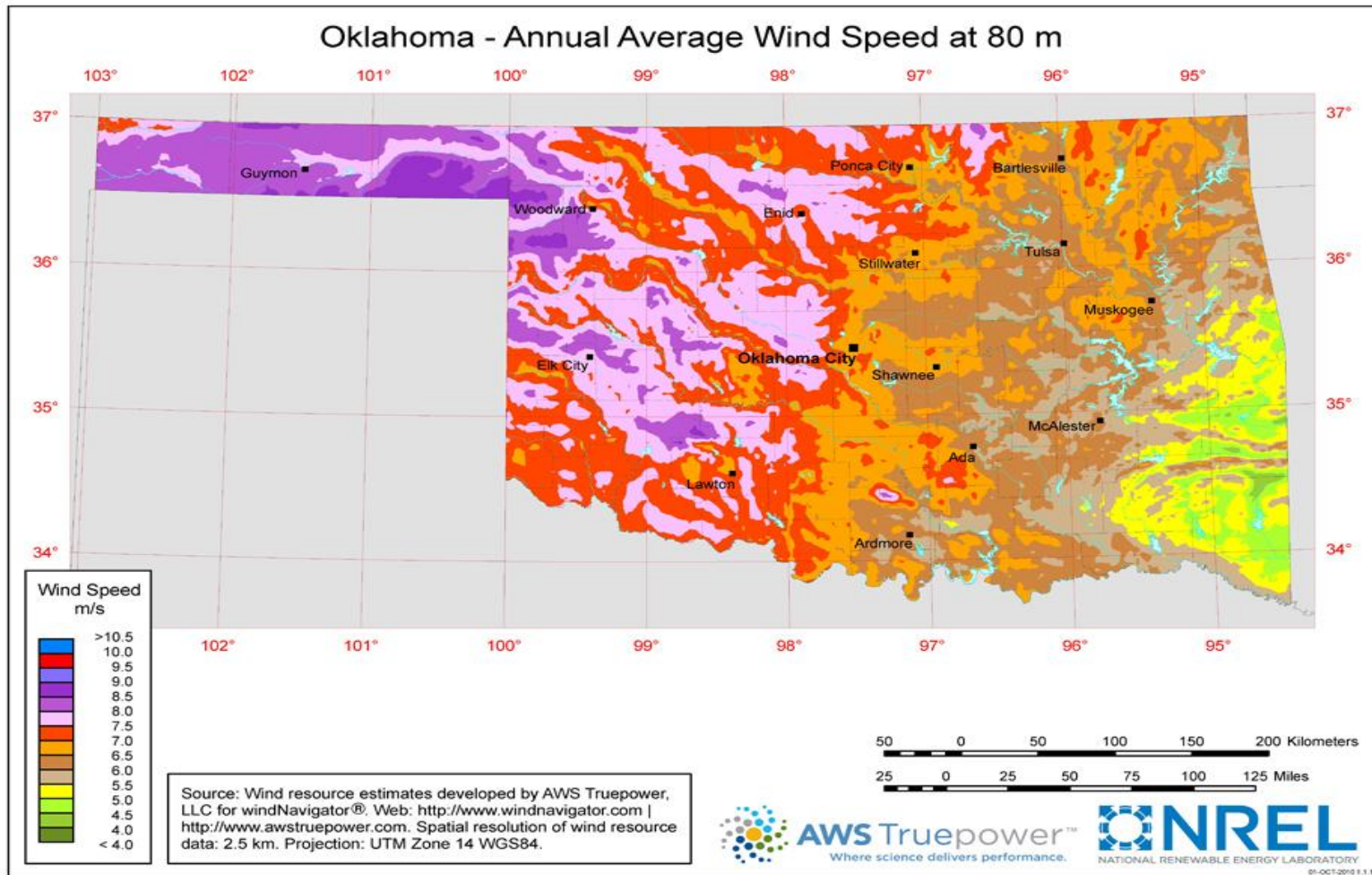
■ Energy Development Considerations for Oklahoma Tribes

- Resource Potentials
- Grid Access and Active Transmission Planning
- Tribal electricity and energy usage
- Land Ownership

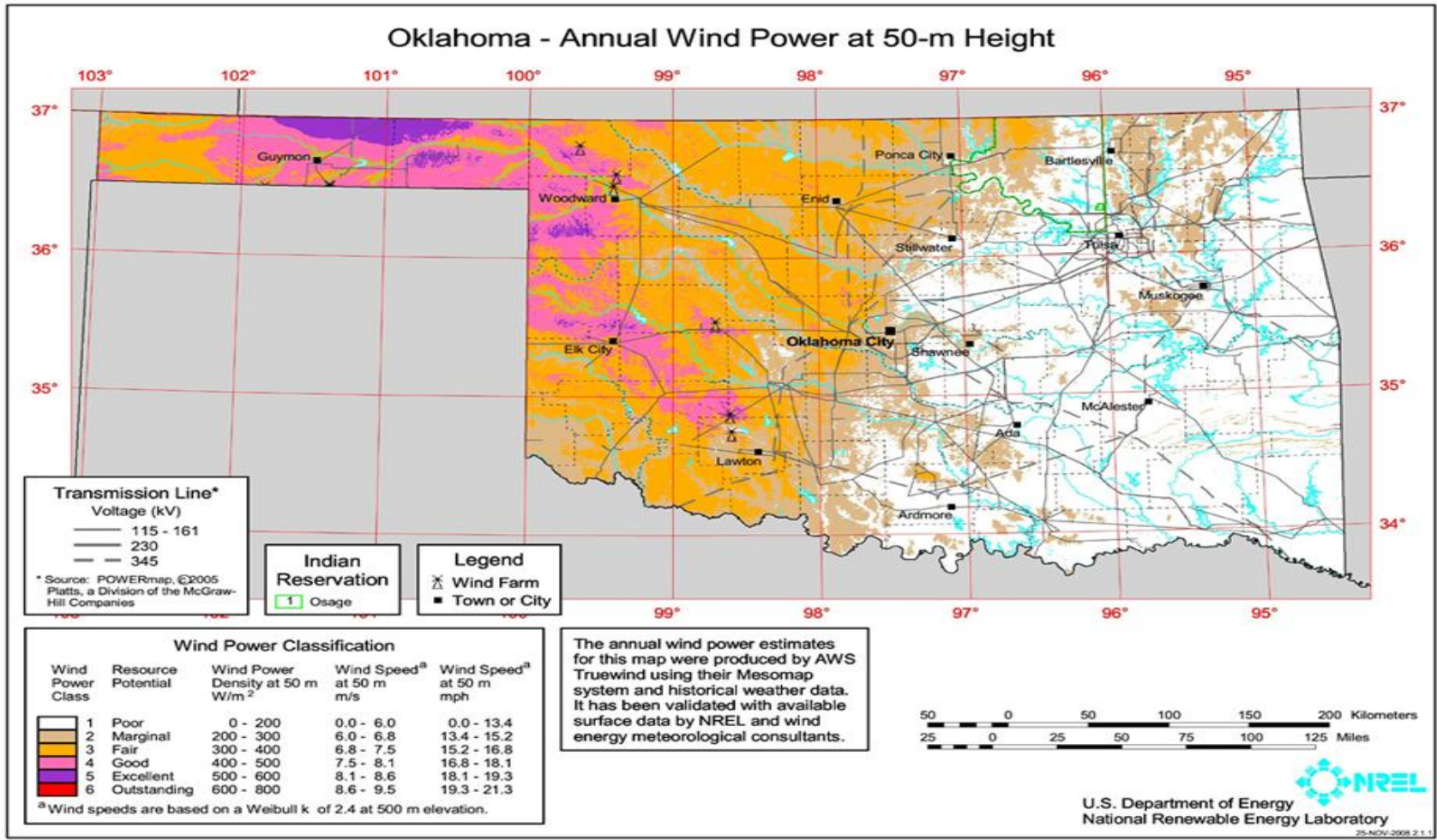


Oklahoma Energy Market

Oklahoma Wind Potential



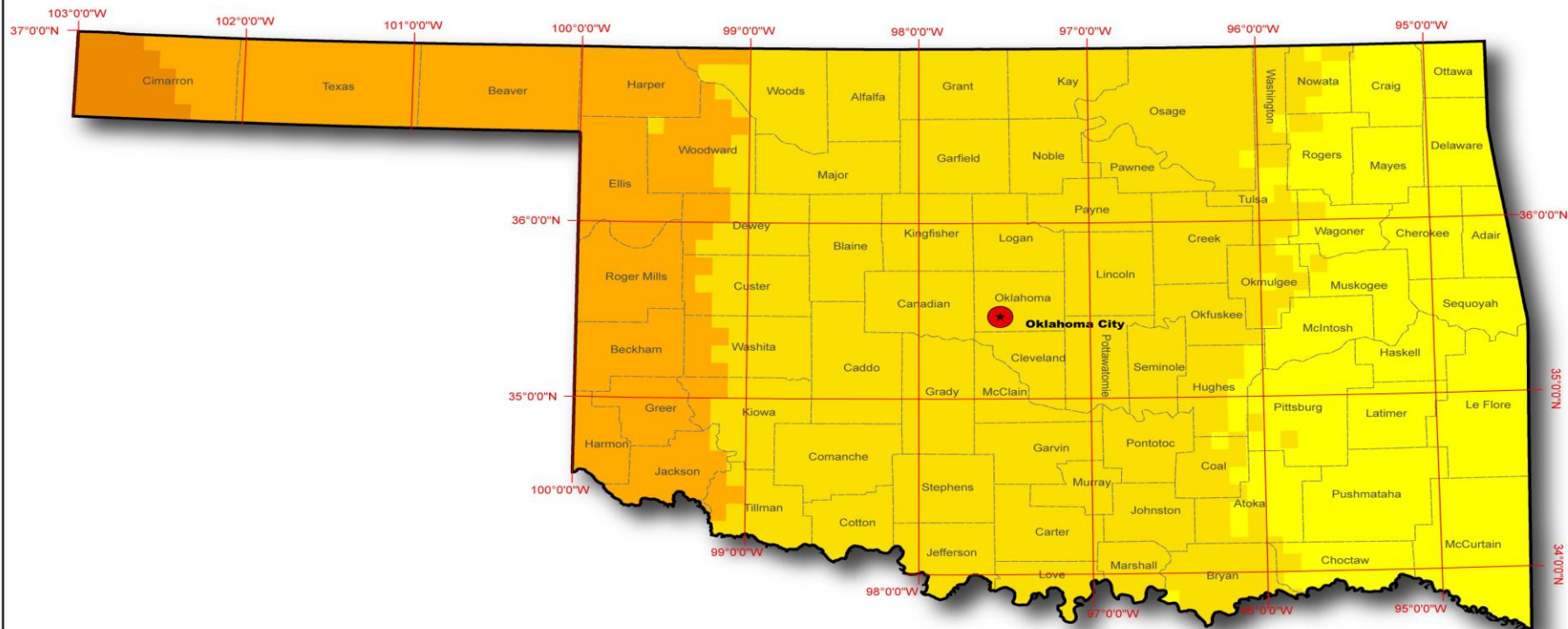
Oklahoma Community Wind Potential



Oklahoma Solar PV Potential

Global Solar Radiation at Latitude Tilt - Annual

Oklahoma



Model estimates of monthly average daily total radiation, averaged from hourly estimates of direct normal irradiance over 8 years (1998-2005). The model inputs are hourly visible irradiance from the GOES geostationary satellites, and monthly average aerosol optical depth, precipitable water vapor, and ozone sampled at a 10km resolution.

kWh/m²/Day



0 35 70 140 Miles

This map was produced by the National Renewable Energy Laboratory for the U.S. Department of Energy, September 25, 2007



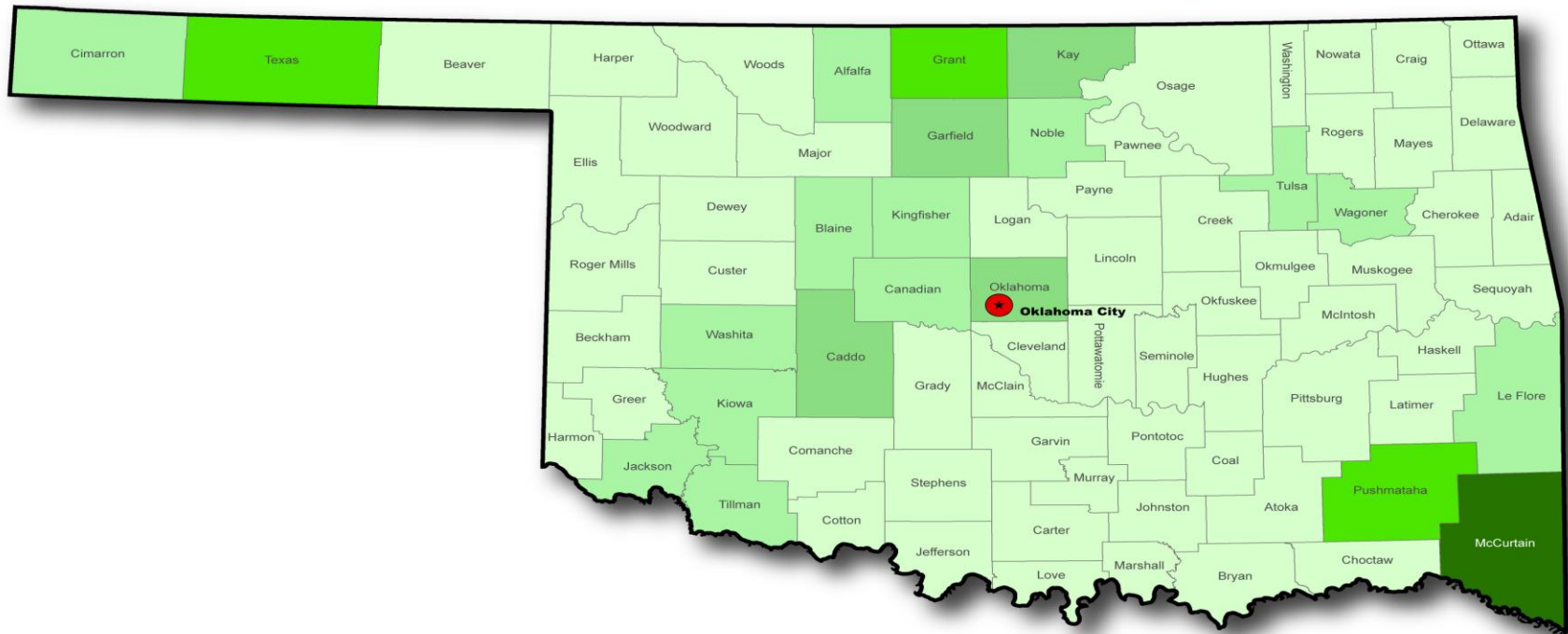
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Oklahoma Biomass Resource Potential

Biomass Resources

Oklahoma

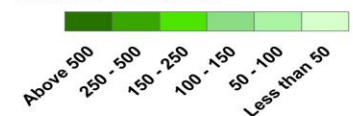


This study estimates the technical biomass resources currently available in the United States by county. It includes the following feedstock categories:

- Agricultural residues (crops and animal manure);
- Wood residues (forest, primary mill, secondary mill, and urban wood);
- Municipal discards (methane emissions from landfills and domestic wastewater treatment);
- Dedicated energy crops (switchgrass on Conservation Reserve Program lands).

See additional documentation for more information at <http://www.nrel.gov/docs/fy06osti/39181.pdf>

Thousand Tonnes/Year



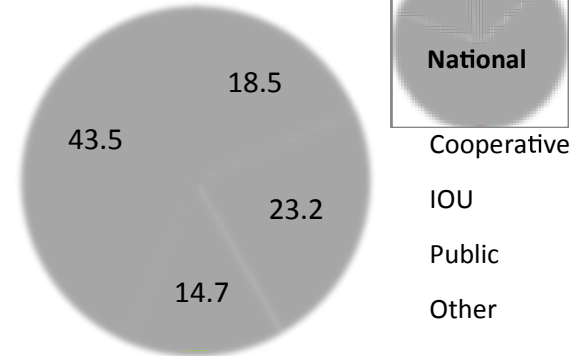
Southern Plains Region



Energy Prices	Region	U.S.
Electric (¢/kWh)	2.9-20.5 (Avg. 8.3)	0.01-123.2 (Avg. 9.8)
Kerosene (\$/gal)	NA	2.68
Heating Oil (\$/gal)	2.00	2.39
Propane (\$/gal)	1.51	1.78
Natural Gas (\$/mcf)	11.23	12.14

St.	RPS	Interconnect	Net Meter
KS	20% by 2020	200 kW	200 kW
OK	15% by 2015	No	100kW*
TX	10,000 MW by 2025	10 MW	10-25 kW

Percent Consumers served
by Utility Type in Region



Major Utilities

TXU Energy Retail Co
LP

Reliant Energy Retail
Services LLC

Tribal Energy Planning Model

Nine Step Process:

Step 1: Identify and convene stakeholders

Step 2: Establish a leadership team

Step 3: Develop a common energy vision

Step 4: Develop a community energy baseline

Step 5: Develop energy goals

Step 6: Identify and evaluate policy, program, project
and resource options

Step 7: Find and secure funding sources

Step 8: Compile the Plan

Step 9: Measure and evaluate

Energy Planning

Step 1: Identify and convene stakeholders

- Tribal Members
- Tribal Government
- Tribal Enterprises
- Utilities/Coops
- Others?

Key success component – Identify and select an energy “champion” to shepherd the process

Energy Planning

Step 2: Establish a leadership team

- Tribal leadership
- Tribal government executives
- Tribal enterprise executives
- Tribal Member representative(s)
- Key stakeholders



Energy Planning

Step 3: Develop a common energy objective and vision

- Increase and ensure energy reliability
- Minimize environmental impacts
- Diversify energy supply
- Use local, renewable resources
- Strengthen, support economic development
- Build workforce/jobs
- Ensure energy affordability
- Generate revenue for tribe
- Create jobs for tribal members
- Energy security / self-sufficiency
- Save money (offset energy costs)
- Keep money in tribe (rather than pay to local utility)
- Stabilize energy costs for tribe and tribal members

Energy Planning

Step 4: Develop a community baseline

- Energy use by “sector” –
gaming/hotel/resort, farming, residential,
governmental, other
- Energy uses: electricity, heat, transportation
fuel
- Future load?

Energy Planning

Step 5: Establish specific energy goals

- Reduce electricity use by _____% by 2022
- Reduce energy costs by _____% by 2022
- Obtain _____% of electricity from renewable sources (RPS) – 15% by 2015 in OK
- Create _____ # of clean energy jobs

Energy Planning

Step 6: Identify and evaluate policy and program resource options

- Develop a ranking system to understand cost-effectiveness of different program
- Best practice models:
 - Total Resource Cost model – considers life-cycle benefits for policies and programs
(www.apscservices.info/EEInfo/CA_stdndr_Prac_Man.pdf)
 - Levelized Cost of Energy model – compares costs of renewable energy projects across different technologies and timeframes
(http://www.nrel.gov/analysis/tech_lcoe.html)

Energy Planning

Step 7: Identify and secure funding

- Tribal funding
- DOE Technical Assistance Program
- Other Fed agency TA and grant programs
 - USDA
 - EPA
 - HUD
 - Commerce
 - DOI
- OK Governor's Energy Office

Energy Planning

Step 8: Complete the Plan

- objectives
- goals
- Baseline
- Barriers
- Program/project options
 - Demand side
 - Generation
- Recommendations
- Adoption by Tribal Council





Energy Planning

Step 9: Measure, evaluate, fine tune





■ On-Line Resources

DOE Office of Indian Energy –

<http://energy.gov/indianenergy/resources/energy-resource-library>

DOE Tribal Energy Program - <http://apps1.eere.energy.gov/tribalenergy/>

DOE Energy Efficiency and Renewable Energy (EERE) -

<http://www.eere.energy.gov/>

DOE EERE Database of State/Federal Incentives <http://dsireusa.org/>

National Renewable Energy Lab (NREL) - <http://www.nrel.gov/>

NREL Project Finance - <http://financere.nrel.gov/finance/>

Interstate Renewable Energy Council (IREC) - <http://irecusa.org/>

Additional Written Resources

Guide to Tribal Energy Development

<http://www1.eere.energy.gov/tribalenergy/guide/index.html>

Renewable Energy Development in Indian Country

<http://www.nrel.gov/docs/fy10osti/48078.pdf>

Community Energy Planning

http://www1.eere.energy.gov/deployment/pubs_energy_planning.html

Solar Powering Your Community

<http://solaramericacommunities.energy.gov/pdfs/Solar-Powering-Your-Community-Guide-For-Local-Governments.pdf>

A Guide to Community Solar

<http://solaramericacommunities.energy.gov/pdfs/A%20Guide%20to%20Community%20Solar.pdf>



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