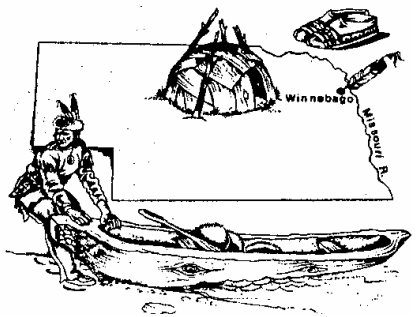
RED MOUNTAIN
ENERGY PARTNERS

Winnebago Tribe of Nebraska
Energy Options Analysis and
Renewable Energy Feasibility Study

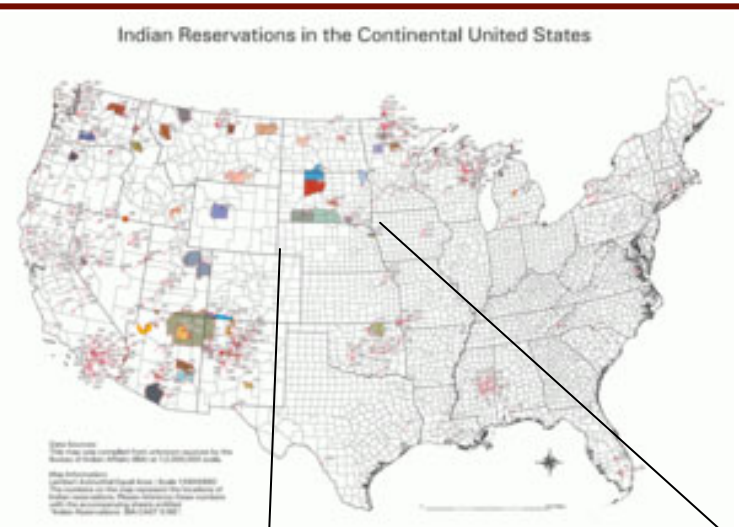


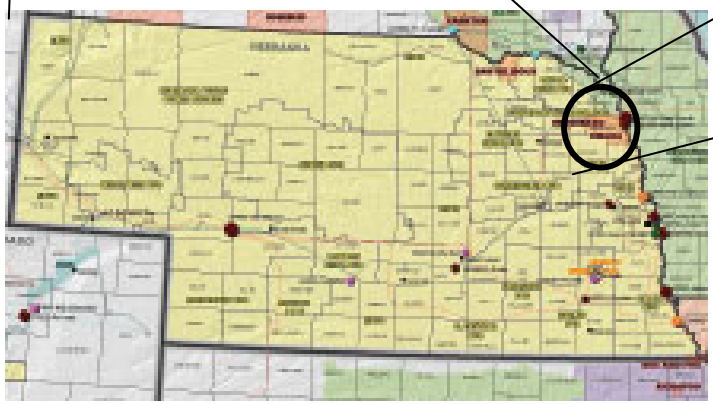
U.S. Department of Energy
Tribal Energy Program Review

Leah Hunter, Energy Committee Member, Winnebago Tribe of Nebraska
Tracey LeBeau, Red Mountain Energy Partners

October 2006

Project Location >> Winnebago Tribe of Nebraska





Winnebago Reservation: 120,000 acres;
88 miles north of Omaha, NE

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Project Location >> Winnebago Tribe of Nebraska

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Project Overview >> Background

- NREL 20 meter anemometer in place from 2001-2002
- Energy Committee formed in 2003
  - Primarily Council members
  - Community representatives added in 2004
- Initial DOI study (2004) to consider resources
- NREL 50 meter anemometer loan secured August 2005
- Geothermal evaluation
- Two DOE-funded projects (2005-6)
  - Energy Options Analysis (completed)
  - Renewable Energy Feasibility Study (just underway)
- Interest in promoting energy self-sufficiency and economic development
- Focus on building energy knowledge/capacity

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Project Participants

- Tribal and Staff Participants:
  - Winnebago Energy Committee
    - Louie Houghton, Council Secretary
    - Jim Snow, Council Vice-Chairman
    - Charles Aldrich, Council Member
    - Leah Hunter, Construction Management (plus Tax and TERO)
  - Winnebago Tribal Council
  - Winnebago Tribe Directors/Facility Managers
    - Land Management
    - Facilities
- Project Consultant:
  - Red Mountain Energy Partners

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Objectives >> Energy Options Analysis

- Analyze energy management options, with goals of improving reliability, safety, and lowering *electricity* costs
- Analyze options for formation of a Tribal energy organization, enabling the Tribe to achieve its energy management goals
- Develop an Implementation Plan to carry out the best-fit options

- Early in the project, Council decided to focus on utility organization formation

Energy Options Analysis Steps

Options Analysis

- Energy Management Options
- Utility Service Options
- Generation Options
- Transmission/ ROW Options

Governance/Structure Analysis

- Organizational Structure
- Tribal Input/ Discussion
- Selected Programs and Defined Responsibilities
- Governance Structure

Implementation Planning

- Tribal Input/ Discussion
- Funding Analysis
- Skills Requirements
- Infrastructure Analysis
- Legal Issues
- Other

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Accomplishments >> Energy Options Analysis

Summarized Energy Management Options

- Conservation
- Energy Efficiency and Weatherization
- Demand Management

	Option	Description	Cost	Implementation	Efficacy	Resource
Conservation						
1	Energy Star Home Improvements	Various on-line tools to evaluate a homes energy performance	$	On-line resource for the home howner.	low to moderate	http://www.energystar.gov/
2	Conservation Cirriculum	Distribution and/or presentation of information relative to energy conservation.	$-$$$	Development of a community education plan that consists of information distribution and or community information meetings.	low to high	http://www.eere.energy.gov/consumer/
3	Utility Metering	Installation of meters on residentail and commercial utility customers.	$$$	Installation and monitoring of energy usage via insured loans and loan guarantees.	low to high	http://www.usda.gov/rus/
4	Home Energy Saver	The Home Energy Saver is designed to help consumers identify the best ways to save energy in their homes, and find the resources to make the savings happen	$	On-line resource for the homeowner.	low to high	http://hes.lbl.gov/hes/vh.shtml
5	Development and Implementing of Energy Policies	Development of tribal laws and ordinances specific to energy.	$$-$$$	Adoption in full or in part of the model building codes developed by the U.S. DOE.	moderate to high, implementing standard buildin codes can reduce energy burden 15-30%	http://www.energycodes.gov/
Energy Efficiency & Weatherization						
1	Federal Tax Credits for Energy Efficiency	A tax credit can provide significant savings. It reduces the amount of income tax you have to pay. Unlike a deduction, which reduces the amount of income subject to tax, a tax credit directly reduces the tax itself. The final rules and forms to clarify wh	$-$$	• review federal tax credits • implement or document applicable tax credits	low to moderate, tax credits range from $200-$2000	http://www.energystar.gov/index.cfm?c=products.pr_tax_credits
2	Residential Code Compliance	Downloadable or on-line tool for conducting preliminary energy audits.	$	Free tool for the evaluation of the housing stock relative to model energy efficiency building codes.	low to high	http://www.energycodes.gov/rescheck/
3	Commercial Code Compliance	Downloadable or on-line tool for conducting preliminary energy audits.	$	Free tool for the evaluation commercial buildings relative to model energy efficiency building codes.	low to high	http://www.energycodes.gov/comcheck/
4	Residentail and Commercial Energy Audits (Contractor)	Contract with energy auditor to conduct residentail and commercial energy audits.	$	Most useful within the context of a tribal energy plan to evaluate housing stock and make systematic improvement to the energy efficiency of the community.	low to high reduction in energy bills from 10%-35% depending energy source	
5	Residential Weatherization	Access to weatherization dollars via state or state-subgrantee or via direct tribal access to Weatherization and/or LIHEAP dollars.	$-$$	• an evaluation of the unit's requirements using formal, written evaluation procedures, • the availability of a comprehensive set of major and minor energy saving measures, and • installation of at least one or more of the following: attic/ceiling insulat	low to high reduction in energy bills from 10%-35% depending on housing stock type and energy source	http://www.eere.energy.gov/wip/program/homes.html
6	Commercial Weatherization	Access to weatherization dollars via state or state-subgrantee or via direct tribal access to WIP and/or Rebuild America dollars.	$-$$$	• an evaluation of the unit's requirements using formal, written evaluation procedures, • the availability of a comprehensive set of major and minor energy saving measures, and • installation of at least one or more of the following: attic/ceiling insulat	low to high	http://www.eere.energy.gov/wip/program/buildings.html
7	Training and Technical Assitance	Utilization of Central DOE Region Training Center	$	• identification of training and technical assistance needs • request and coordinate training and technical assistance from regional training center	low to high	www.weatherization.org/ttassist.htm
8	Weatherization Technical Assistance Program	Project budgets are limited to $5,000 in staff time and travel. Typically this can provide a couple days of on-site assistance or about a week's worth of analysis or assistance via phone and e-mail. Assistance is available on a first-come, first-serve bas	$	• identification of training and technical assistance needs • request and coordinate training and technical assistance from regional training center	low to high	http://www.eere.energy.gov/wip/informationresources/Tap.html
Demand Management						

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Accomplishments >> Energy Options Analysis

Summarized Utility Service Options

- Energy Committee
- Energy Commission (Policy)
- Utility Authority (Oversight)
- Utility Authority (Operations)
- Utility Cooperative
- Decision to focus on Utility Service/Structure Options

Option	Description	Key Benefits	Required Resources	Estimated Implementation Costs	Implementation Timing	Key Issues	Critical Unmet Needs
Comprehensive Utility Services Potentially Including: Electric, Natural Gas, Telephone, Water, Wastewater, Solid Waste							
Committee	**Description**	**Key Benefits**	**Required Resources**	**Estimated Implementation Costs**	**Implementation Timing**	**Key Issues**	**Notes**
Formal working group of individuals dedicated to investigating and recommending specific action regarding existing or new utility services to the community	Facilitates Council and community desires regarding Winnebago utility matters	Promote Energy Planning	Member Participation	$0-$20,000	60-90 Days	Consistency, time commitment to drive consistent efforts	
		Improve Knowledge Base					
		Provide Policy Input to Council					
		Promote Tribal Self Sufficiency					
		Collect Relevant Data					
		Identify and Support Energy Champions					
		Central Location for Community Input					
		Access Grant Funding					
Commission (Policy)	**Description**	**Key Benefits**	**Required Resources**	**Estimated Implementation Costs**	**Implementation Timing**	**Key Issues**	**Notes**
Council-appointed body authorized to develop and regulate policies on utility/energy services	Provides regulatory oversight over specific utility operations providing services to the community	Assert Tribal Sovereignty	Administrative Support	$24,000-$48,000	3-6 Months	Ability to establish authority over outside utility entities	
		Regulations and Codes Consistent with Tribal Community Needs	Member Participation/salaried or not				
		More Responsive Customer Service Policies					
		Regulate ROW and TERA Issues					
		Set Consistent Energy and Utility Policy					
		Potential to Lower Costs Through More Consistent Application of Policy					
		Access Grant Funding					
Authority (Oversight)	**Description**	**Key Benefits**	**Required Resources**	**Estimated Implementation Costs**	**Implementation Timing**	**Key Issues**	**Notes**
Council-established governmental entity(ies) or instrumentalities managing community utility services/operations	Manages oversight/coordination of community utility services/operations on behalf of Tribe and members	Assert Tribal Sovereignty	Charter/By-Laws	$60,000-$120,000	6-12 Months	Initial and continuing member communication re: role	
		Consistent Efforts to Improve System Infrastructure	Administrative support			Ongoing communications with outside utilities	
		Improve Access to Utility Services	IT/Telecom Infrastruture				
		Improve Service Quality					
		Potential for Generation Project Development					
		Lower Costs Through Improved Effectiveness and Efficiency					
		Evaluation of Systems and Interconnection Options					
		Coordinated Energy Program Development					
		Access Grant Funding					
Authority (Operations Management)	**Description**	**Key Benefits**	**Required Resources**	**Estimated Implementation Costs**	**Implementation Timing**	**Key Issues**	**Notes**
Council established psuedo-governmental entity(ies) managing and operating utility services/operations	Operates and maintains specific utility operations providing services to the community	Practice Tribal Self-Sufficiency	Charter/By-Laws	$100Ks-1Ms	1-5 Years	Member communication on need, strategy and plans	
		Improved Control over Utility Services	Administrative support				
		Increase Tribal Member Employment	Operating staff				
		Become Resource for Other Tribal Communities	IT/Telecom Infrastructure				
		Potential for Generation Project Development					
		Access Grant Funding for Infrastructure Improvements					
Utility Cooperative	**Description**	**Key Benefits**	**Required Resources**	**Estimated Implementation Costs**	**Implementation Timing**	**Key Issues**	**Notes**
Council established a tribal electric cooperative to manage and operate utility services/operations	Operates and maintains specific utility operations providing services to the community	Ability to finance through tax exempt mechanisms		$100k-1Ms	1-5 Years		
		Ability to trade and do business with other public power entities surrounding the reservation					
		Fits more readily into WAPA's standard of service requirements for physical allocations					
			Charter/ByLaws				
			Coop has general utility responsibility in the area				
			Tribal Consitution authorizes utilities, condemnation of facilities if appropriate				

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Utility Organization Options

Commission

Purpose
Regulatory authority

Benefits
Central utility venue
Utility service coordination

Challenges
Funding sources
Greater Council involvement

Needed Resources
Legal authority
Tribal Utility Code/ Standards
Administrative support
Multiple part-time members

VS

Oversight Authority

Purpose
Utility service policy/planning coordination

Benefits
Centralized planning
Sovereign attributes of Tribe
Access to grant funding for planning/coordination
Less Council involvement

Challenges
Ongoing funding needed

Needed Resources
Organization leadership
Administrative support
Board of Directors
Charter/By-Laws

VS

Operating Utility

Purpose
Operate/improve utility services

Benefits
Sovereign attributes of Tribe/separates utility assets/liabilities
Can allow for direct receipt of hydro allocations
Access to grant funding
Ability to finance infrastructure improvements

Challenges
Fee structure required
Significant commitment to taking over operations

Needed Resources
Organization leadership
Administrative/customer service support
Operations staff
Board of Directors
Charter/By-Laws

Winnebago Utility Commission

Regulatory authority; policy and planning; potential for utility operations

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Accomplishments >> Identified Needs

- Needs
  - Coordinated infrastructure planning
  - Potential to operate one or more utilities in the future
  - Entity of Tribe with authority to access funding
  - Independent Board to oversee utility/energy issues

Accomplishments >> Energy Options Recommendations

- Expanded Energy/Utility Committee continue as transitional entity:
  - Identified Program Directors
  - Council Members
  - Legal Counsel
  - Other Identified Stakeholder(s)
  - Other support as needed
- Establish Energy Manager position
- Identify transitional and on-going organization funding options
- Develop Winnebago Utility Code
- Council to empower the Winnebago Utility Commission (regulatory and planning oversight) and at an appropriate time, Winnebago Tribal Utility (operations)
    - Winnebago Legislative Code amendments

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Accomplishments >> Utility Code Draft

- Code authorizes the Winnebago Utility Board to:
  - Clarify tribal civil jurisdiction to regulate current and future utility services and facilities by creating a Commission structure; and
  - When appropriate, to perform utility services or acquire, own, or build utility facilities (generation; transmission; distribution) at a future date
- Additional information needed
  - Enforcement
  - Taxation

Accomplishments >> Utility Commission Implementation Plan

Community Communications

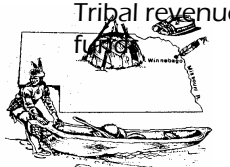
- Scope
- Purpose
- Contacts
- Processes

Utility Board Establishment

- Member selection
- Charter/By-Laws
- Compensation
- Schedule

Access to Funding

- Grants
- Loans
- Utility fees
- Member rates
- Direct existing Tribal revenues/ funds



Council Authorization

- Approve Utility Code
- Seek funding
- Establish Utility Board
- Limitations on powers

Committee Analysis/ Review/Coordination

- Review data/options
- Recommend to Council

Utility Infrastructure Documentation

- Electric
- Gas
- Water
- Wastewater
- Telephone
- Internet

Program/Service Prioritization

- Weatherization
- LIHEAP
- Energy Efficiency

Utility Code Development

- Authorize Utility Board/ jurisdiction
- Franchise/access
- Service requirements
- Utility taxes
- Utility planning
- ROW

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Project Status

- Energy Options Analysis completed
- Utility Implementation Plan completed
- Energy Manager position description developed
- Utility Code drafted
- Utility Providers summary completed

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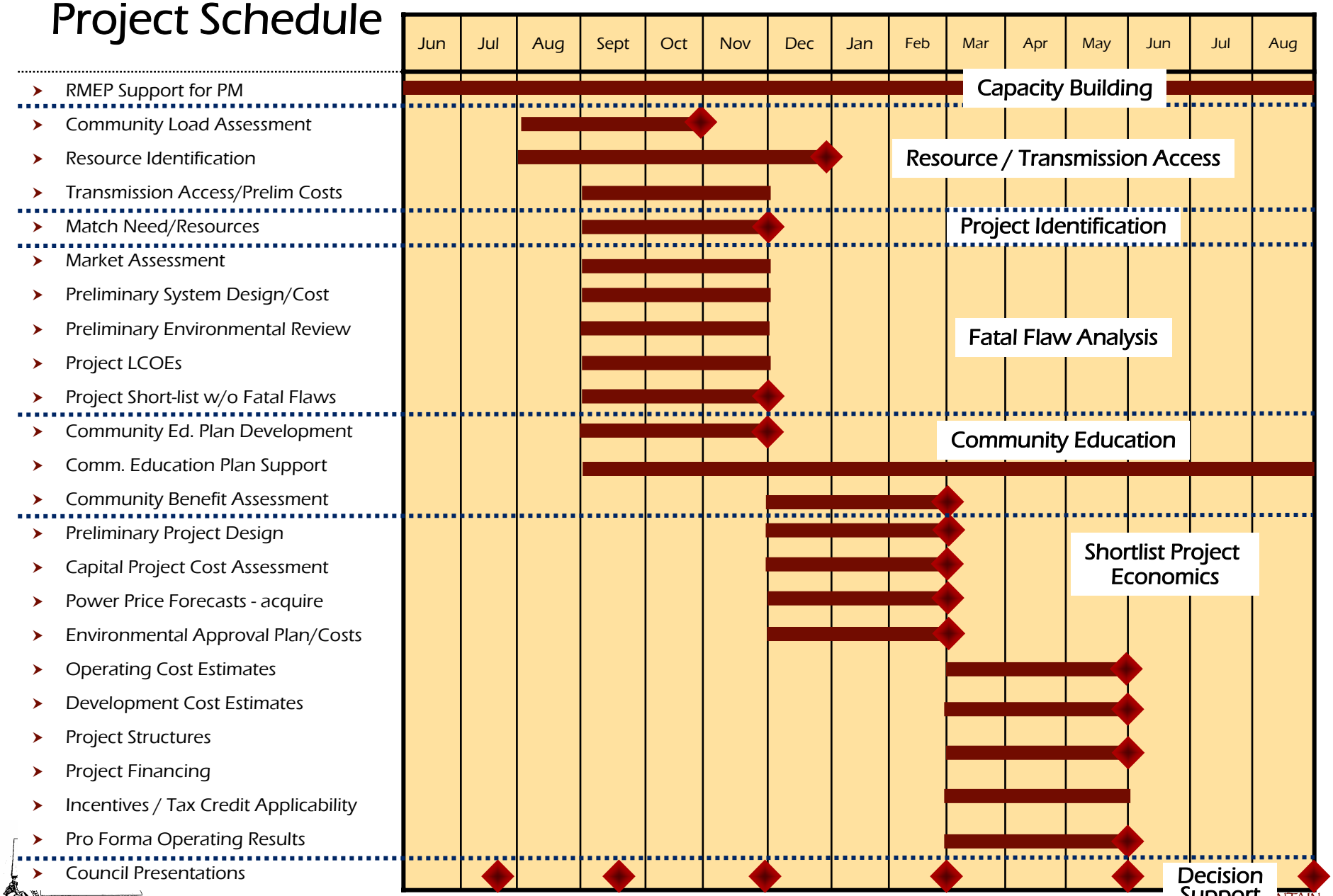
Objectives >> Renewable Energy Feasibility Study

- Develop a project planning and oversight framework
- Analyze Tribal loads and resources, power markets and delivery options;
- Analyze technology, system and environmental impacts;
- Design the project plans: stakeholder outreach, financial plans, permitting and agreements, O&M, and sustainable implementation plan; and
- Evaluate the project benefits and impacts

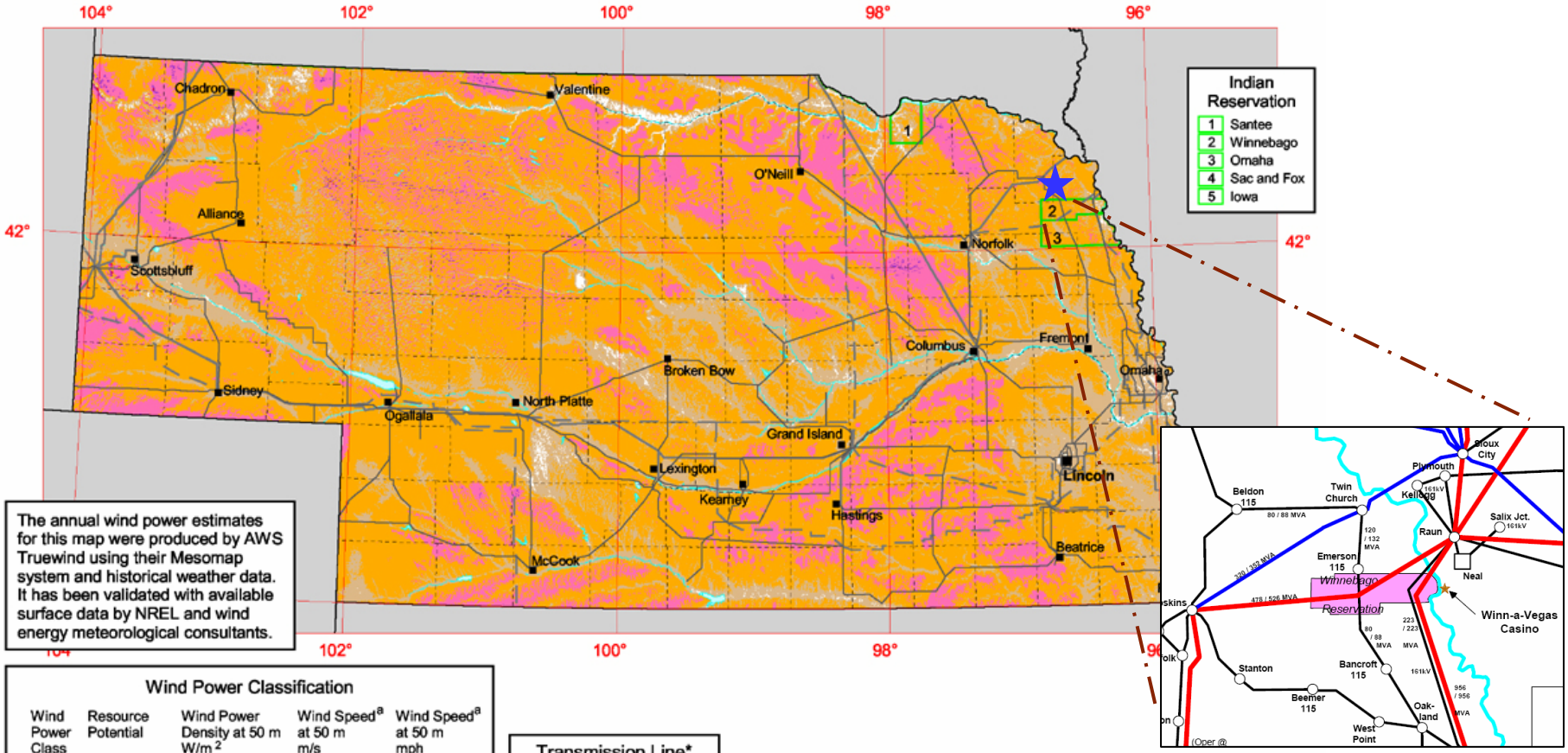
Project Overview >> Scope

- Capacity Building –Establish Energy Manager position
- Project Identification
  - Load Assessment
  - Resource Monitoring
  - Power Markets & Delivery
  - Community & Stakeholder Outreach
- Technology Selection and System Design
- Environmental Evaluation
- Project Economics
- Tribal Benefit Assessment
- Project Implementation Plan

Project Schedule



Project Status >> Wind Resource Indications



The annual wind power estimates for this map were produced by AWS Truewind using their Mesomap system and historical weather data. It has been validated with available surface data by NREL and wind energy meteorological consultants.

Wind Power Classification

Wind Power Class	Resource Potential	Wind Power Density at 50 m W/m^2	Wind Speed[a] at 50 m m/s	Wind Speed[a] at 50 m mph
1	Poor	0 - 200	0.0 - 5.7	0
2	Marginal	200 - 300	5.7 - 6.5	12
3	Fair	300 - 400	6.5 - 7.2	14
4	Good	400 - 500	7.2 - 7.8	16
5	Excellent	500 - 600	7.8 - 8.2	17
6	Outstanding	600 - 800	8.2 - 9.0	18
7	Superb	> 800	> 9.0	

[a] Wind speeds are based on a Weibull k of 2.0 at 800 m elevation.

LEGEND:
345KV
230KV
115-161 KV
xxx / xxx MVA: Summer Normal / Summer Emergency MVA Ratings

Transmission Line*
Voltage (kV)
35
115 - 161
230
345
* Source: POWERmap, ©2005 Platts, a Division of the McGraw-Hill Companies

50 0 50 100 150 200 Kilometers
50 0 50 100 Miles

U.S. Department of Energy
National Renewable Energy Laboratory

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Project Status >> Initial Data/Insights

- Initial wind data (near casino) was not favorable for large scale power generation, but facility-scale wind was possible
- Expectations for better wind conditions in other reservation locations
- Excellent access to transmission grid

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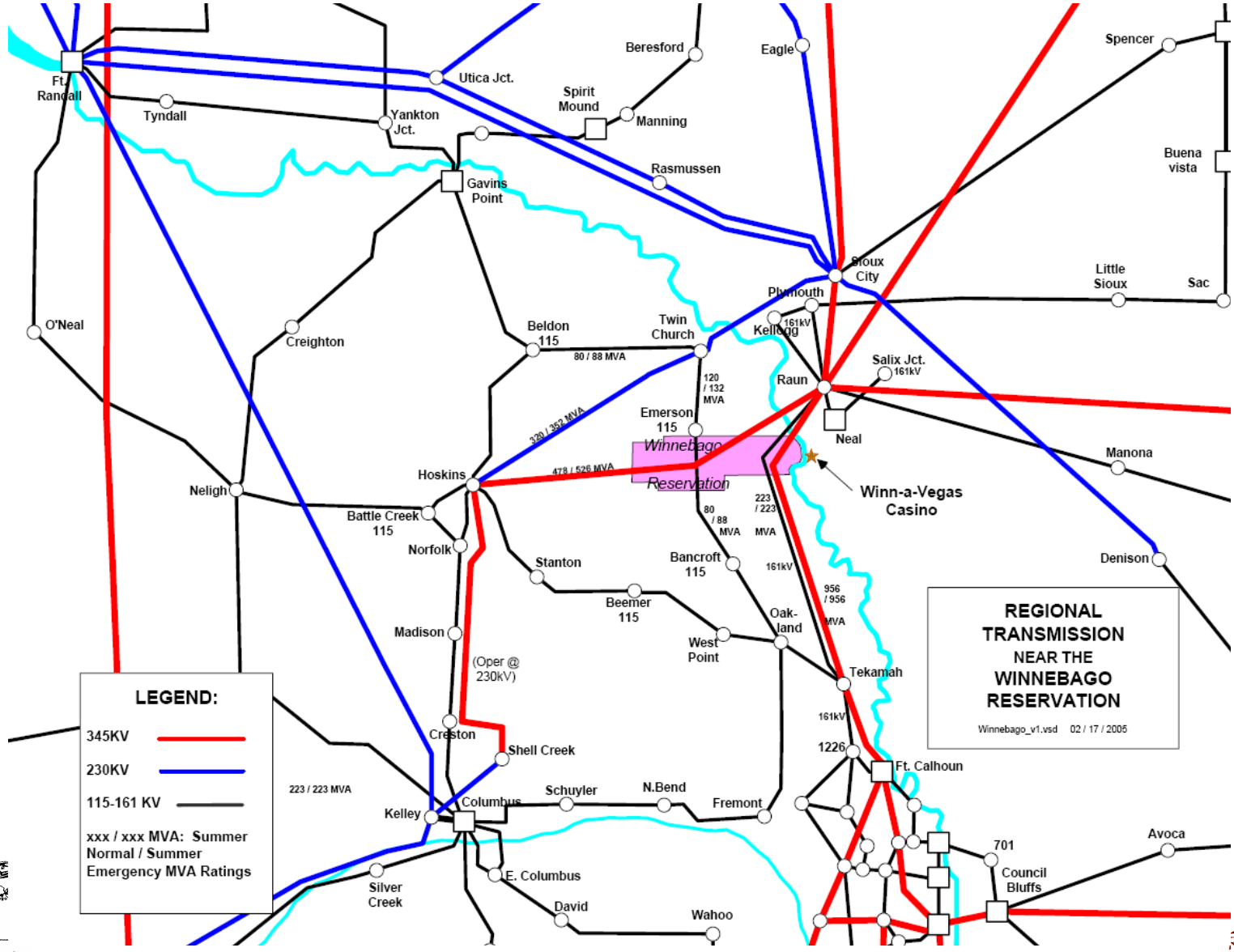
Project Status >> Transmission Access



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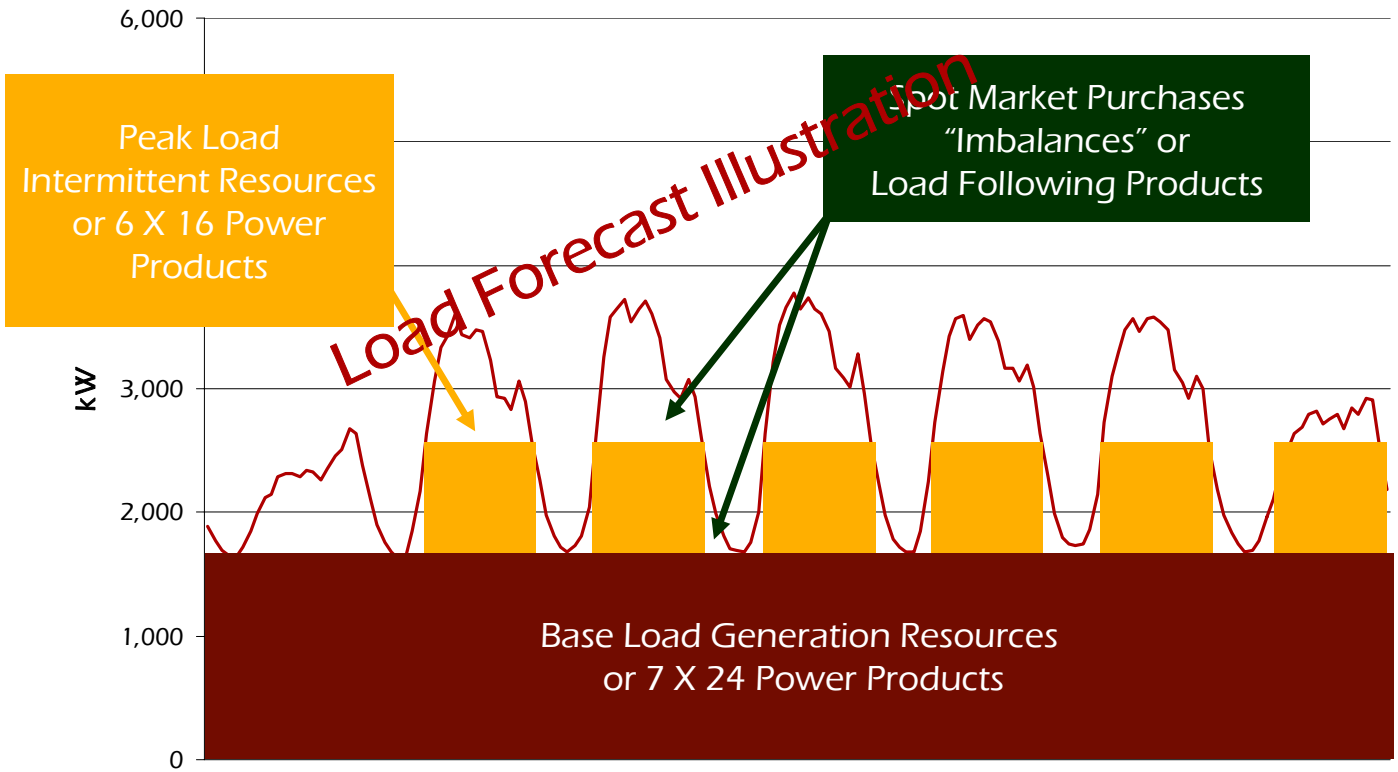
Project Status >> Load Assessment

- Data gathering underway
  - Monthly energy usage for all facilities
  - Hourly detail as available



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Further Information

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