

U.S. Department of Energy

Final Report DE-FG36-03GO13022

July 20, 2003 – January 31, 2006

CHEROKEE NATION ENTERPRISES ***WIND ENERGY FEASIBILITY STUDY***



Cherokee Nation Enterprises

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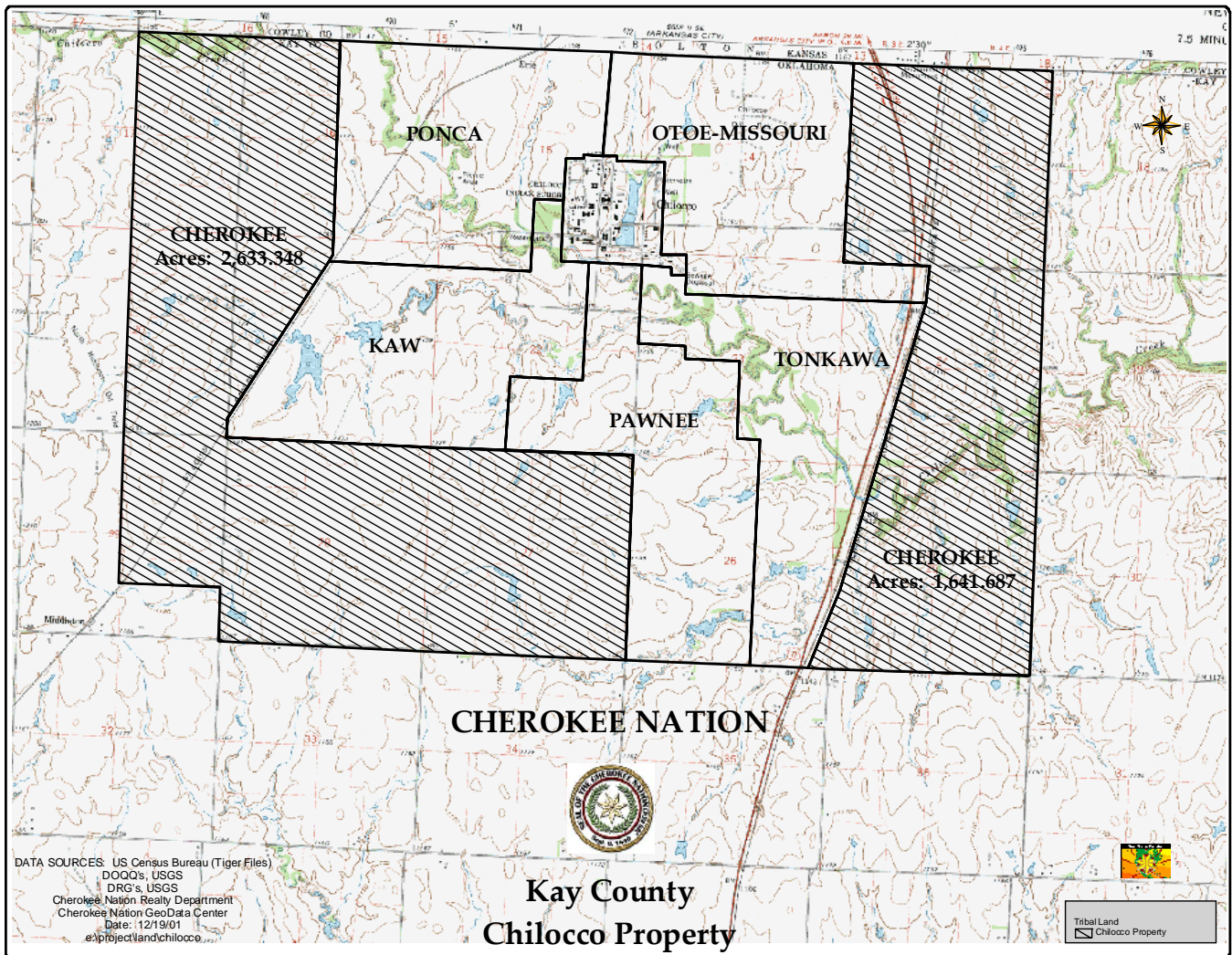
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EXECUTIVE SUMMARY

Cherokee Nation Enterprises (CNE) appreciates the opportunities given by the U.S. Department of Energy in receiving a grant award. CNE has conducted a feasibility study on the Chilocco property in north-central Oklahoma since the grant award on July 20, 2003. This study has concluded that there is sufficient wind for a wind farm and that with the Production Tax Credits and Green Tags, there will be sufficient energy to, not only cover the costs of the Nation's energy needs, but to provide a profit. CNE has developed a wind energy team and is working independently and with industry partners to bring its renewable energy resources to the marketplace. We are continuing with the next phase in conducting avian, cultural and transmission studies, as well as continuing to measure the wind with the SoDAR unit. The attached business plan will describe the plans in more detail, as well as the economic feasibility of the project.



PROJECT OVERVIEW

Cherokee Nation, the second largest tribe in the United States is a federally-recognized Indian Tribe with a membership of approximately 260,000. It is the goal of Cherokee Nation to have profitable enterprises to allow the Tribe to become self-sufficient. The goals of Cherokee Nation Enterprises are aligned with the goals of Cherokee Nation described in the Cherokee Nation Declaration of Designed Purpose, which can be described by the Cherokee word “ga du gi” meaning working together as individuals, families, and communities for a quality of life for this and future generations by promoting confidence, tribal culture, and an effective sovereign government.

Cherokee Nation Enterprises, Inc. is a wholly-owned corporation under Cherokee Nation and has managed the Department of Energy grant award since July 20, 2003. In summary, we have determined there is sufficient wind for a wind farm at the Chilocco property where Cherokee Nation owns approximately 4,275 acres. The primary goal would be more of a savings in light of the electricity used by Cherokee Nation and its entities which totals an estimated eight million dollars per year. Cherokee Nation Enterprises (CNE), working independently and with industry partners, plans to bring its renewable energy resources into the marketplace through a well-documented understanding of our undeveloped resource. Our plan is to cultivate this resource in a way that will ensure the development and use for our energy will be in an environmentally and culturally acceptable form.

OBJECTIVES

The objectives conducted by the Wind Energy Team have proven to be successful. The original site selected was on the northeastern portion of the Chilocco property. However, after careful consideration, it was decided the best placement of the SoDAR unit would be on the southeastern portion of the land where the Office of Environmental Services (OES) already had an air-monitoring station. They were equipped with electricity and telephone access. An additional phone line was added for contacting the SoDAR unit via modem and electric lines run to the unit. Also a fence was placed around the SoDAR unit, as the location was in a field where cows grazed, and for protection.

We received letters from Cherokee Nation showing preliminary environmental assessments and cultural studies have already been performed on the property and there were no significant impacts. In the next phase, we will make sure all NEPA requirements are met.

Some of the activities identified in the Statement of Work will need to be performed in the next phase of the project such as: transmission studies and inter-connect agreements; power purchase agreements; system designs; and long-term operating and maintenance planning. Training has been conducted on the use of the SoDAR. Tribal professional training is being planned as we progress in the project. Cherokee Nation Enterprises looks forward to being a leader in the field of renewable energy and will create many training programs for Cherokee Nation and other Tribes.

GOALS

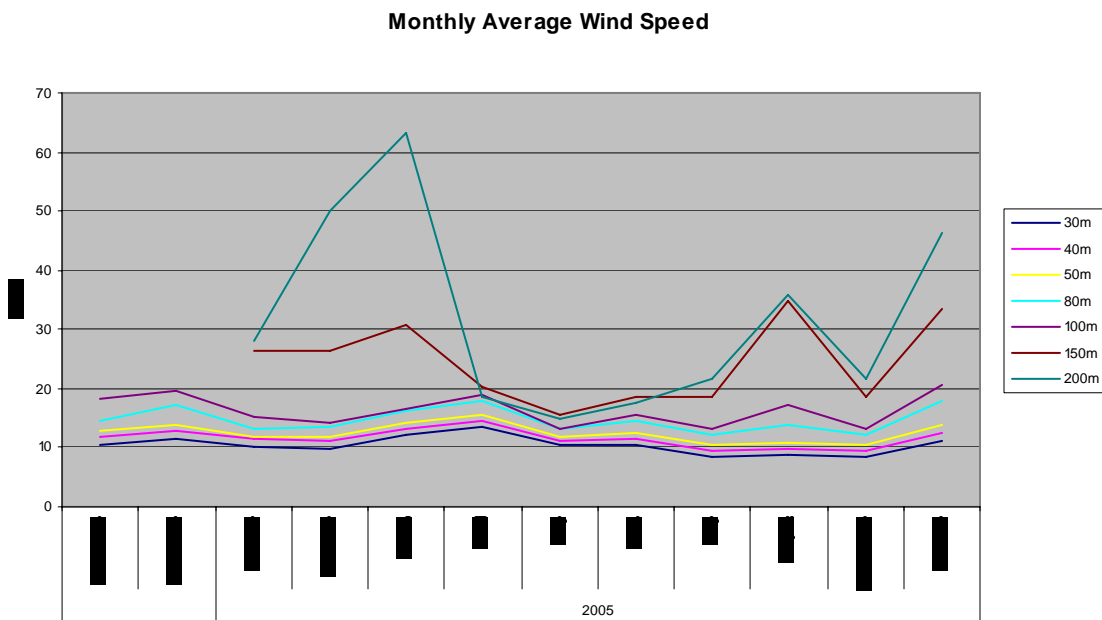
CNE's short-term goal is to produce enough energy to offset the costs of its current utilities, which have totaled more than 1.4 million dollars in the past eleven months for the present facilities. However, expansion plans are already in the process and some of our locations will be in operation in 2006. All monies saved would mean more funds available for additional

development projects. A percentage of all profit from Cherokee Nation Enterprises goes to Cherokee Nation to assist in social service programs such as education and health care, and other social services. Rather than increasing the demand on the public utilities, CNE could assist them with sustainable energy while providing additional low-cost, safe, and clean alternative to other forms of their current energy production.

We plan to move the SoDAR unit to Catoosa and then to Claremore and Tahlequah to perform wind studies at other locations to determine if there is enough wind to offset the electrical load in these areas. Catoosa is our flagship casino with 80,000 square feet, 5 restaurants, gift shop, 150-room hotel, smokeshop, offices, conference space, training center, and an 18-hole golf course and clubhouse. At Claremore, 20 miles from Tulsa/Catoosa, Will Rogers Downs (open 2006), which will have 250 electronic games, live horse racing, fine dining and live entertainment, over 400 full hook-ups for RV's, and a Clubhouse.

The long-term goal is to develop a wind farm large enough to produce energy and its associated green tags to possibly help other tribes lower their utility rates. Cherokee Nation Enterprises proposed completing a feasibility study on the potential development of a wind energy facility for both Tribal use and sale to the electrical grid. Cherokee Nation Enterprises could benefit economically from the surrounding states' (Colorado, New Mexico, Iowa and Texas) Renewable Portfolio Standards. Each state requires that a percentage (2%-10%) of their power come from renewable resources and those resources are usually not required to be in state. That mandate is to be in effect by the year 2010.

WIND ASSESSMENT – SoDAR



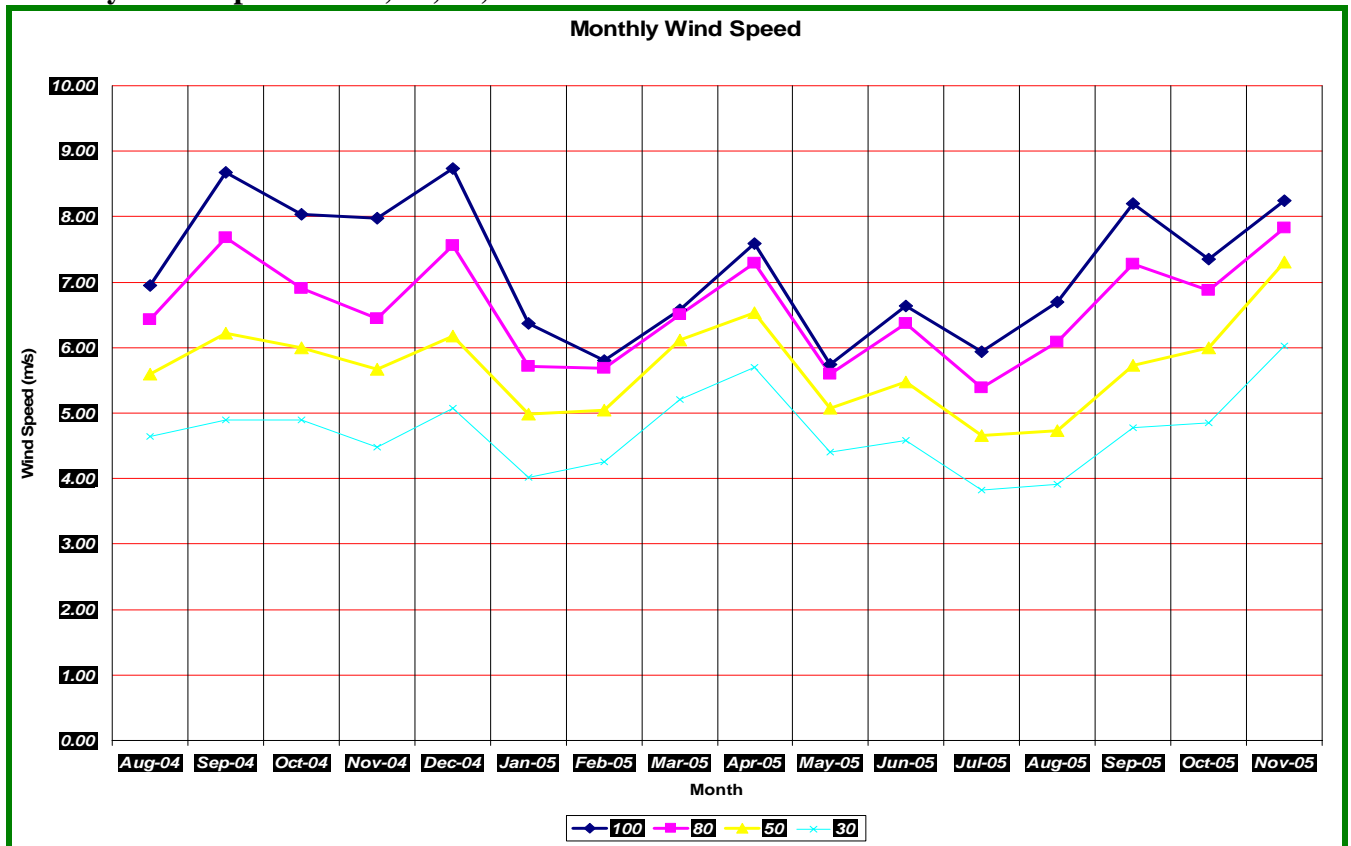
A mini-SoDAR unit is being used to measure the wind instead of an anemometer. The SoDAR operates similar to a radar-Doppler system and can accurately measure the wind in 5-meter increments up to heights of 200 meters. The mini-SoDAR uses a patented 32-element phased array antenna to form the three orthogonal beams needed to measure a complete three-dimensional wind profile. The SoDAR acoustic signal processor is engineered for reliable,

unattended field operation. The storage capacity for the data is 270 days. Another advantage for the SoDAR in comparison to a 50-meter anemometer is there are no permits required. It requires very little maintenance. Data analysis software is available to process SoDAR data, including automatic generation of data reports and summary plots. These systems are in use at Cape Canaveral and Vandenburg AFB to provide cost-effective monitoring of the wind profile for rocket support and rocket launch support.

Justification for selecting sodar technology versus conventional wind monitoring instrumentation: The cost to install a 100-meter tower (hub height) for the anemometer would be approximately \$120,000. Towers must be maintained by professional climbers and site technicians. Other details to consider would be permitting, assembling and having the tower lighted and maintained. To duplicate this study in other areas would require similar expenses and efforts in assembling, permitting, and maintaining equipment. Since this SoDAR system is portable, it can be easily transported to other locations within the 14-county area for similar studies.

The Wind Energy Project Manager communicates electronically with the SoDAR daily by modem and retrieves a report on the unit and detailed wind measurement data. This data is put into a report with specific heights of 30, 40, 50, 80, 100, 150, and 200 meters selected. CNE's project team can interpret some of the data, but we have contracted with a certified meteorologist who verifies the wind energy data. The main reason CNE chose to use the SoDAR to measure the wind energy was because of its ability to measure the higher altitudes, and it is mounted on a trailer so it can be moved easily to other locations to perform similar studies for potential distributed generation.

Monthly Wind Speeds at 30, 50, 80, 100 meters



ACTIVITIES

The “Wind Energy Team” has expanded with team members performing different portions of wind measurement, operations, maintenance, compiling the data, and forming the business plan. The Office of Environmental Programs (OES) of Cherokee Nation has assisted with allowing us to place the SoDAR unit near their air-monitoring station north of Newkirk, Oklahoma on the Chilocco property. The area is well protected and has electric and phone access. Staff members have assisted by initially setting up the SoDAR at the location and checking the unit weekly when they go to the site. The Grant Administrator has managed the grant, grant reports, daily data drawdown by modem, managed the funds and has been the liaison between Cherokee Nation, Cherokee Nation Enterprises, U.S. Department of Energy, Atmospheric Systems, utility companies, consultants, and all persons involved to this point. An IT Specialist was added to the team whose computer and electronic knowledge proved to be invaluable to the team. With his expertise, he was able to conduct a daily check on the operation of the SoDAR, assist with compiling the data, and do maintenance on the SoDAR unit.

We experienced a few problems earlier in the grant in getting the equipment and in the beginning operations. However, most of the problems were with the modem. The SoDAR, with the exception of one time, has proven to be a reliable source of receiving data even in adverse weather.

The data can be retrieved daily by modem and received through software called PADS. The data is received at ten-minute intervals at heights from 5 meters to 200 meters. At the end of each month, the data is transferred to an excel spreadsheet at one-hour averages at specific heights of 30, 40, 50, 80, 100, 150, and 200 meters. We have continued to measure the wind and the data has been sent to our meteorologist. As soon as the data has been verified by the meteorologist, it will be forwarded to the Department of Energy. As we prefer to keep the data confidential, a CD of all our data currently received will be sent to the Department of Energy with the hard copy of the report. We also received recent data from the Kaw Nation which we are still in the process of the data comparison.

The Kaw Nation has an anemometer located 3.21 miles from the site where the SoDAR is located. Cherokee Nation and Cherokee Nation Enterprises have a good working relationship with the Kaw Nation and have collectively gathered several months of data for a comparison, as requested by the Department of Energy. Principal Chief Chad Smith recently sent a letter of approval to the Kaw Nation granting permission for ecological studies. In the next phase, Cherokee Nation Enterprises plans to combine efforts with Kaw Nation in conducting some of the necessary studies and thereby reducing costs.

Since the transmission lines are only one-half mile to the west of Cherokee Nation property, it appears that the Cherokee Nation property would be the most practical location to build a sub-station.

Preliminary wind resource data suggests a wind turbine power efficiency of 20 – 30%. This is based on a Vestas V-80 2 megawatt wind turbine which, if only one were to be installed at the measured site of Chilocco, would produce approximately 4,385,959 kilowatt hours (27% efficiency) each year or enough electricity to power 493 homes. ("A kilowatt-hour is the electrical energy consumed in one hour at the constant rate of one kilowatt. The average household in the United States uses about 8,900 kilowatt-hours of electricity each year.")

Turbine selection is a science and must be precisely analyzed for each installation. For example: If we were to consider installing a single NEG Micon 2000/72 (which is now owned by Vestas) 2 megawatt wind turbine the annual production would drop to 3,533,390 kilowatt hours. (20% efficiency) Enough to power 397 of our homes, almost 100 homes less.

The specific analysis for wind turbine selection encompasses many factors: Cut in speed, terrain, turbulence in the area swept by the blades, low level nocturnal jet stream, ambient air temperature and density. All turbines manufactured today take these factors into consideration when designing and building their turbines. As with all design and manufactured products they all perform well, and some perform better in certain conditions. Part of our study will be to design each wind energy installation to maximize performance.

REPORTS

All quarterly reports are on file with CNE and DOE. The financial forms (SF-269 and SF-272) have been completed quarterly by Cherokee Nation Accounting Department.

TRAINING

Shortly after we received the SoDAR unit, a three-day training was conducted by the meteorologist with personnel from Cherokee Nation Office of Environmental Systems (OES) Department and Cherokee Nation Enterprises in attendance. One year later, another three-day training was conducted for additional instructions on the SoDAR and for maintenance and testing on the equipment. Plans are for future training in wind energy, maintenance and operation, as well as involvement with schools in our wind energy project.

FINANCIAL

Since the award was granted to Cherokee Nation and managed by Cherokee Nation Enterprises, the funds were handled as a pass-thru account. A spreadsheet with receipts attached was sent to Cherokee Nation to draw down the funds and transfer to Cherokee Nation Enterprises Accounting Department to reimburse expenses. A drawdown spreadsheet is attached showing all drawdown expenses. All expenses were paid by CNE and reimbursed by the drawdown funds. As discussed with DOE financial personnel, any additional expenses needed would be taken from the amount allocated for salaries and the balance of funds would be used to reimburse salaries.

PUBLICITY

An article was published in the Cherokee Phoenix in the February 2006 issue entitled "CNE researching ways to use wind energy". The Cherokee Phoenix is a monthly newspaper with a circulation of 97,000 world-wide.

The Project Manager, Carol Wyatt, was invited by the Oklahoma Department of Commerce and Oklahoma Wind Power Initiative to give a presentation on our project at the Emerging Energy Technology Conference in Norman, Oklahoma on September 17, 2005.

BUSINESS PLAN

A complete and comprehensive business plan has been prepared and presented to the CEO and Wind Energy Team with the assistance of a consultant. Since this is such a viable project, CNE needed the expertise of the consultant for the following:

- Financial analysis
- Contact and negotiations with turbine manufacturers

- Power Purchase Agreements with utilities
- Resources on Green Tags and PTC's
- Resources for funding

The consultant has been a valuable asset to the Wind Energy Team and will continue working with CNE in the next phase of the project.

SUMMARY

CNE recently received a grant award from the U.S. Department of Interior, Minerals and Assessment Program. Those funds will be used for the next phase which will include avian studies, mammal studies, flora and fauna studies, and transmission studies on the Chilocco property.

The business plan has met the approval of the President and CEO of Cherokee Nation Enterprises and will be presented to the Board of Directors of CNE, as well.

Cherokee Nation Enterprises wishes to express appreciation to U.S. DOE for the grant award and the personnel who were always available to us. With the help of the grant funds, we were able to conduct the feasibility study for a possible wind farm, and allowed us to dream about future possibilities in relation to wind energy. Cherokee Nation has always been a leader in conducting business and looks for ways to benefit the people in areas of health, education, and social services. If we are able to install a wind farm to offset the costs of electricity for the facilities of Cherokee Nation, Cherokee Nation Enterprises, and Cherokee Nation Industries, the money saved will be worth more than selling the energy.

We are looking forward to the future in wind energy and the possibilities it affords.

ATTACHMENTS

- A. Patent Certification - DOE F 2050.11
- B. Final Assistance Property Closeout Certification
- C. Drawdown Spreadsheet
- D. Business Plan

CHEROKEE
NATION
ENTERPRISES
ENERGY
DEVELOPMENT

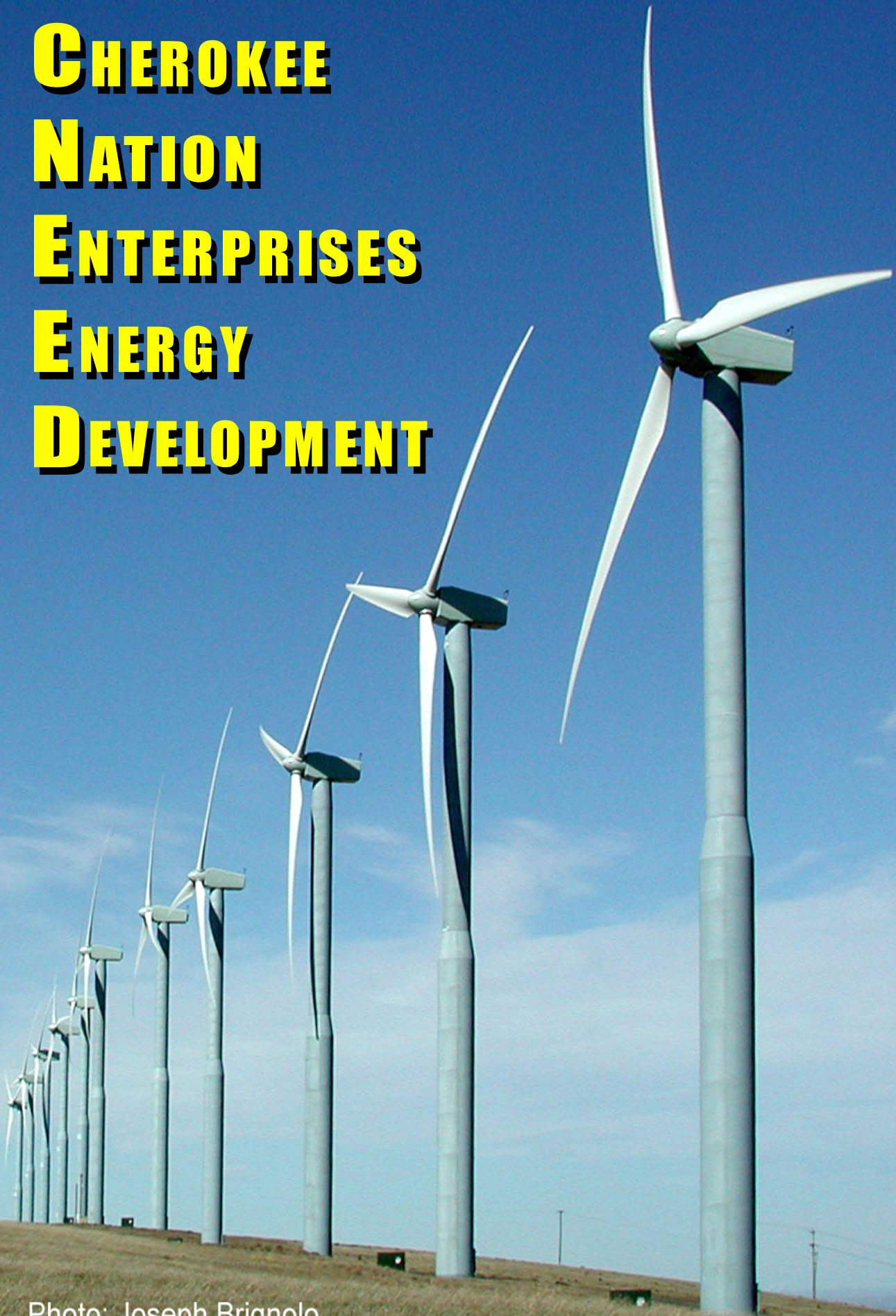


Photo: Joseph Brignolo

DISCLAIMER

The mission of Joseph Brignolo and this Business Plan is to foster, develop, and support Cherokee Nation Enterprises (CNE) by providing relevant, pertinent and professional information and assistance to CNE. CNE is considering the opportunity to extend its business operating unit to include the design, development, and generation of electricity by installing wind turbines on Cherokee Nation Property.

The information contained herein is offered with the explicit understanding that:

- ❖ The information supplied is intended to provide general guidance and direction on all aspects of CNE wind development;
- ❖ Joseph Brignolo is not engaged in rendering legal, accounting, financial or other professional advice.
- ❖ The information is not intended to replace professional advice and at all times Joseph Brignolo and his associates recommend that if legal, accounting or other expert advice is required, clients seek professional advice before committing funds to this or any business venture.
- ❖ Joseph Brignolo nor his associates are responsible for the results of any action taken or not taken on the basis of information supplied or omitted.

This Business Plan was researched, compiled, and written by

Joseph Brignolo

for

Carol Wyatt and Cherokee Nation Enterprises

Wind Project Synopsis

1. There is a measured and verified financially feasible wind resource at the Cherokee Nation property near Chilocco
2. The estimated electrical load for CNE, CNI, CNB, and the Cherokee Nation is \$8 million.
3. According to the preliminary wind speeds and relevant Return on Investment data presented in this Business Plan Cherokee Nation Enterprises could build a 50 megawatt (20 – 2.5 megawatt wind turbines) wind farm to:
 - Offset the entire \$8 million Tribal electrical costs;
 - Recover the investment (an estimated \$62.5 million in 7.72 years; and
 - Gross \$99,382,245.00 in years 7.73 – 20, the life of the project.
4. Determine other commercial, industrial, and residential load centers that will benefit by additional wind turbine installations.
5. Develop a Phased Approach and Business Plan to implement wind energy development in other areas of Oklahoma, the United States, and internationally.
6. Provide an opportunity to research, develop, and firmly establish a Cherokee Nation Tribal Utility.
7. Expand Cherokee Nation Enterprises Branding strategies to include renewable energy.

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April 2006

Executive Summary

Overview

Cherokee Nation Enterprises, Inc. (CNE) is a wholly-owned corporation of Cherokee Nation. The executive offices of CNE are at Catoosa, Oklahoma, located at I-44 and 193rd East Avenue, on the northeastern side of Tulsa. David Stewart, President and Chief Executive Officer (CEO) of Cherokee Nation Enterprises, and Chadwick Smith, Principal Chief of Cherokee Nation, are dedicated to pursuing wind energy production toward satisfying the Cherokee Nation's energy needs. Cherokee Nation, the second largest tribe in the United States, is a federally-recognized Indian Tribe with a membership of approximately 260,000. Cherokee Nation, which includes: Cherokee Nation Industries; Cherokee Nation Businesses; and Cherokee Nation Enterprises, is one of the largest employers in Oklahoma with approximately 6,000 employees.

Background

CNE was formed in 1990 by Cherokee Nation. Cherokee Nation Enterprises (CNE) is expanding the knowledge base of its business unit to help achieve economic benefits from its assessed and verified energy resources. Our goal is to provide a sustainable renewable energy resource for use by the Cherokee Nation. CNE, working independently and with industry partners, plans to bring its renewable energy resources into the marketplace through a well-documented understanding of our undeveloped resource. Our plan is to cultivate this resource in a way that will ensure the development and use of our energy will be in an environmentally and culturally acceptable form. This will be accomplished by a methodical and well-defined Project Development Plan.

CNE Mission Statement

Cherokee Nation Enterprises supports the economic self-reliance of the Cherokee Nation.¹

CNE Vision

CNE's vision is to be the model tribal enterprise delivering superior value to our customers and providing financial independence to the Cherokee Nation through sustained growth, job creation and business development.

CNE Long Term Goals

CNE's goals are aligned with the Cherokee Nation Declaration of Designed Purpose², which can be described by the Cherokee word "ga du gi" meaning working together as individuals, families, and communities for a quality of life for this and future generations by promoting confidence, tribal culture, and an effective sovereign government. CNE remains focused on these objectives:

- *Driving profitability through managed, sustained growth;*
- *Maximizing gaming opportunities;*
- *Providing dividends to the Nation based on CNE profits achieved over the long term;*
- *Creating jobs with career paths for Cherokees;*
- *Promoting profitable, sustainable cultural tourism within the 14-counties of the Cherokee Nation; and*
- *Conducting business in a manner consistent with Cherokee values.*

¹ See CNE Mission Statement; See Appendix Page 54.

² Goals & Objectives in the Designed Purpose: "The Goals and Objectives for each of the divisions identify milestones in moving toward the desired outcomes. They drive behaviors, feelings, and attributes toward the desired outcomes over the long term. Goals should be "SMART" -Specific, Measurable, Achievable, Related to the mission, and Time-bound.

Project Mission Statement:

Cherokee Nation Enterprises will develop and install enough renewable energy for all the electrical demands of the Cherokee Nation facilities, as well as commercial, retail, industrial, residential, and consumer customers; and plan for the required area-related energy growth.

This will be accomplished by:

1. Developing wind power where appropriate to satisfy wholesale, local, or distributed loads.
2. Providing CNE generated power to Cherokee facilities as well as private companies, consumers, and government organizations.
3. Selling enough electricity in the wholesale market to offset the electricity bill Cherokee Nation facilities.

Approach

The Project Development Team will develop and expand this project in phases:

Phase One – Develop a Wind Farm for Commercial Output and Export to Other Markets

- Measure and verify wind data at wind farm site in Chilocco.³
- Establish solid relationship with off-taker (power purchaser) and complete Power Purchase Agreement.⁴
- Complete Avian and Environmental Studies as well as National Environmental Policy Act (NEPA) studies for wind project.³
- Complete Wind Farm Project Cost Analysis Spreadsheet.⁵

Phase Two – Installing Wind Power to Satisfy CNE, and Cherokee Nation’s Local, Distributed Loads

- Discovery and recording of Tribal, industrial (CNI), Casino(s) and Resort, and local loads.
- Gathering and verification of wind data in the most profitable places where we will install wind power to satisfy those local electrical loads.
- Measure and verify wind data in additional potential local turbine sites for additional profit centers.

Phase Three – Expanding Wind Farm Development in Other Locations

- Identify and secure other property both domestic and international for wind farm development.
- Measure and verify wind data at each potential wind farm site.
- Establish solid relationships with off-taker(s) and complete Power Purchase Agreement(s).

Phase Four – Develop the Cherokee Nation Tribal Utility Commission

- Prepare Tribal Utility white paper.
- Develop and form Utility Structure.
- Discovery and recording of additional Tribal, industrial commercial, retail, and local loads.

Phase Five – Develop Associated Business and Opportunities Related to Wind Energy Development

- Teaching, Training, and providing Grants to assist other Tribes in developing wind energy in their locations.

³ This step has been accomplished by Carol Wyatt pursuant to DOE grant award DE-FG36-03GO13022, award amount \$166,179.

⁴ Funding secured by Carol Wyatt via the DOI Minerals Assessment Program, award amount \$101,780.

⁵ See Wind Farm Project Cost Analysis; Appendix Page **Error! Bookmark not defined.**

- Turbine operation and maintenance training facility located at the wind farm.
- Small turbine manufacturing facility located near Chilocco.
- Joint venture to build SoDAR equipment.
- Structure a relationship between the Cherokee Nation and turbine tower manufacturers to manufacture turbines at the Port of Catoosa.

Market and Market Objectives – Use of the electricity we will generate.

Defined:

- Utilities
 - Direct sell to local utilities, power authorities, and co-ops.
 - Identify, define, and sell to export markets.
- Local Loads
 - Target renewable energy to specific businesses with heavy electricity usage.
- Tribal Loads
 - Satisfy the Cherokee Nation facilities load at each electricity meter.
- Distributed Loads
 - Work with local power authorities, and electric co-ops to provide them with our renewable energy for distribution.
- Production Tax Credit Pass-through
 - Identify entities with tax appetites to invest in our unused Production Tax Credits.
- Green Tag sales
 - Sell Renewable Energy Credits or Green Tags⁶ to industry as well as the general public.
 - Identify socially-relevant programs to attach to the Green Tag sales to generate additional income for Cherokee Nation.

Project Objectives

Our primary objective is to firmly establish CNE as the preeminent electrical energy supplier to Cherokee Nation, its subsidiaries, and the non-Cherokee business and industries in our operating and distribution area.

To achieve these objectives we must accomplish the following:

1. Complete and detailed identification of all locations and electricity used within the Cherokee Nation.
 - a. Cherokee Nation Industries
 - b. Cherokee Nation Tribal facilities
 - c. Cherokee Nation Enterprises
 - d. Other commercial and / or industrial electrical loads.
 - e. Residential Developments
2. Develop wind resource assessment plan for local and distributed load profiles.
3. Research potential interconnect opportunities with utilities, electric co-ops, and independently owned power distributors.
4. Determine project size per verified location as it pertains to load and wind resource.
5. Complete Wind Farm Project Cost Analysis per location.
6. Initiate Project Development.
7. Form Tribal Utility.

⁶ Green Tags are created when wind power or other renewable energy is substituted for traditional power.

Marketing Strategy

- First year:
 - Establish wholesale / retail price and customers of renewable energy.
 - Seek Green-e Certification for our Project(s).⁷
 - Resolve socially-relevant program strategies to co-market with Green Tags.
 - Develop Green Tag website.
- Second year:
 - Explore entry into the “U. S. Electricity Spot Market.”⁸
 - Secure contractual relationships with commercial and industrial electricity customers.
 - Pre-sell Green Tags to researched customer base.
 - Research Production Tax Credit “pass through” investors.
- Third year:
 - “Go live” with our web site to market our real-time generated Green Tags.
 - Fine tune market interface with socially-relevant programs as it pertains to the value added portion of our on-line Green Tags sales.
 - Use public relations to support Cherokee Nation Enterprises’ wind energy product.
- Fourth Year:
 - Use wind farm and local distribution successes to position and promote projects in Oklahoma and other areas of the country.

Finance

- Grants
 - Department of Energy
 - DOE grant award DE-FG36-03GO13022, award amount \$166,179 for wind resource assessment.
 - Department of Interior
 - DOI Minerals Assessment Program, award amount \$101,780 toward Phase One of Project Development.
 - Private and Public Foundations
 - Educational Foundation of America.
 - U. S. Fish and Wildlife
 - Terrain and Environmental Studies; Available January, 2007.
- Cherokee Nation Enterprises
 - CNE in-kind contribution for renewable energy development on fee land.
 - Certain areas of Chilocco.
 - Turbine site at Cherokee Casino and Resort.
 - Turbine site at Cherokee Nation complex in Tahlequah.
 - Other potential energy centers such as Will Rogers Downs, commercial and industrial loads.
- Federal Government based financing
 - Rural Utility Service Loans.

⁷ Green-e is the nation's leading independent certification and verification program for renewable energy products; See Appendix; Page 55.

⁸ The Electricity Spot market is a high-risk program to increase the sell price of renewable energy by 100-200%. There are several entities which will handle this type of transaction but the risk/rewards need to be evaluated.

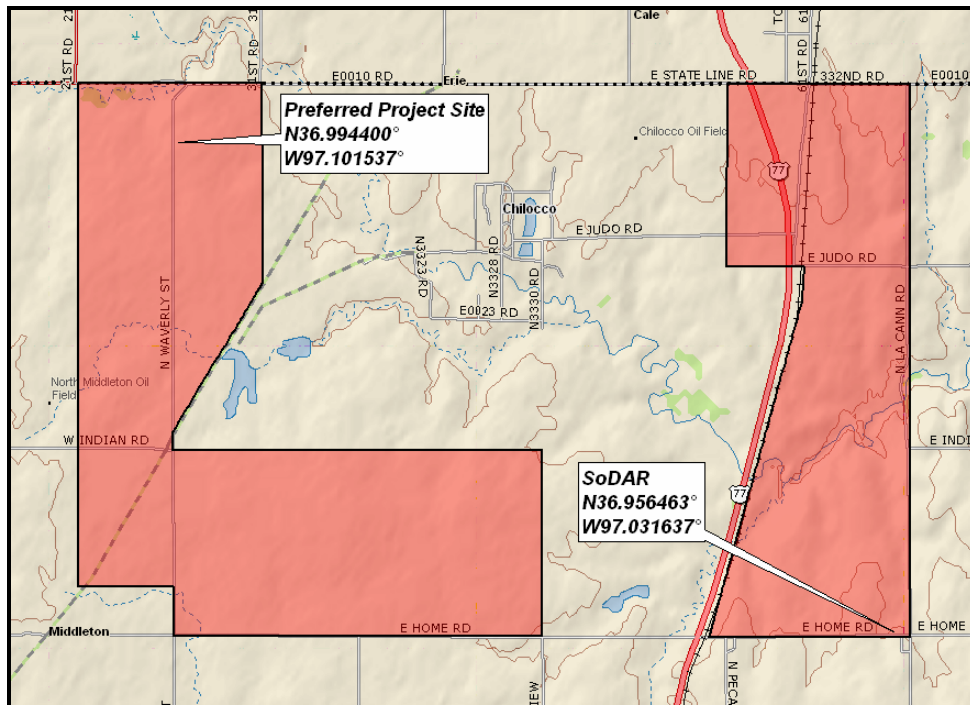
- BIA – Bank One guaranteed loans.
- Commercial Finance
 - Study feasibility of commercial versus self-finance.
 - Arrange suitable financing.
 - Research financing as it pertains to Production Tax Credits.

Present Situation

The Cherokee Nation spends an estimated average of \$8,000,000.00 annually on their collective electricity bills. The largest single loads are The Cherokee Casino and Resort at Catoosa with 24,000,000 kWh representing \$1,200,000.00; and the Tribal Complex at Tahlequah with an estimated 16,250,000 kWh representing \$1,300,000.⁹

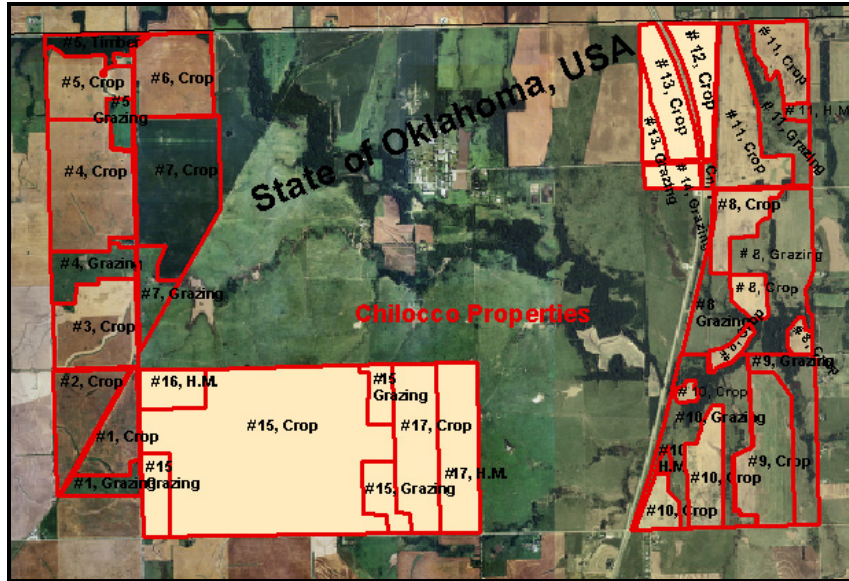
Wind Farm Location

Chilocco is the location on which the following Financial Projections are calculated. This is the area in which we will locate the wind farm:



⁹ The price per kilowatt hour for the Casino is \$.05 and the price for electricity in Tahlequah is much higher.

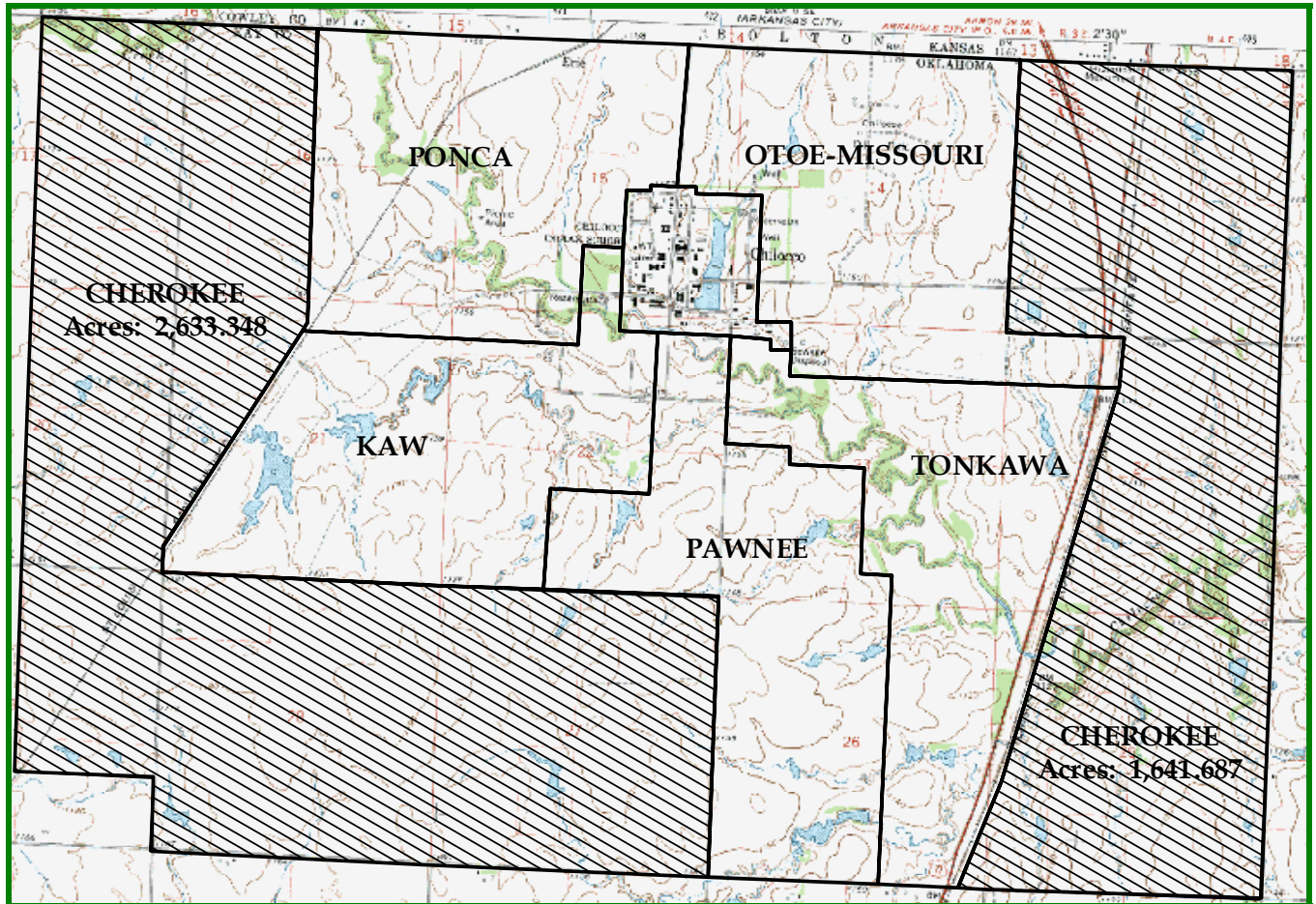
Fee vs. Trust Land



 Cherokee Nation Fee Land  Cherokee Nation Trust Land

The beige shaded areas are Cherokee Trust Land. The clear outlined areas of the map are Fee Land and any potential wind energy development on Fee Land will not be paid by the Mineral Assessment Program grant award and must be paid by other funding.

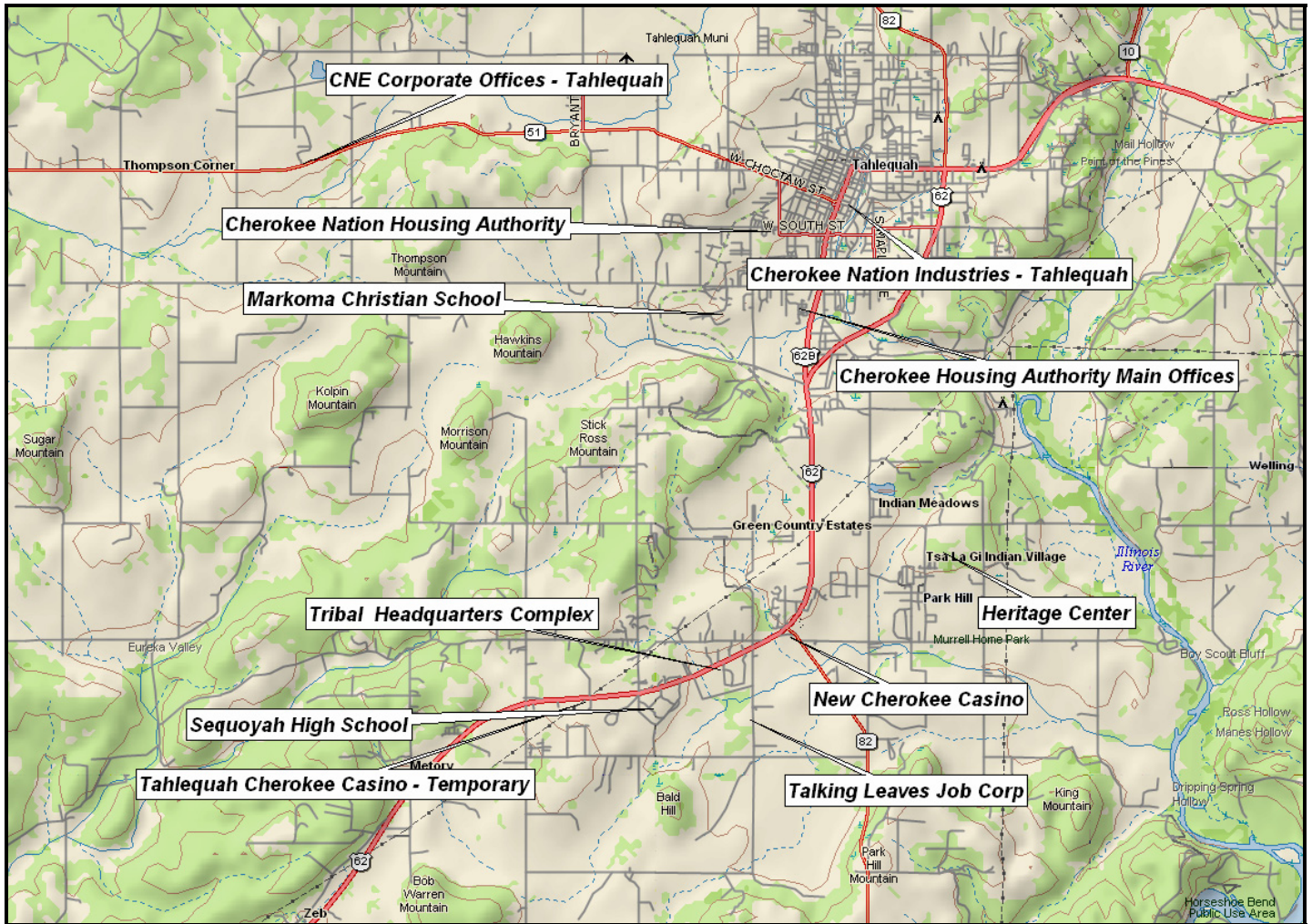
Other Potential Participating Tribes in the Chilocco Area



This map presents the opportunity to include five other Tribes in our Project. There may be certain funding, public relations, and synergistic advantages to these relationships.

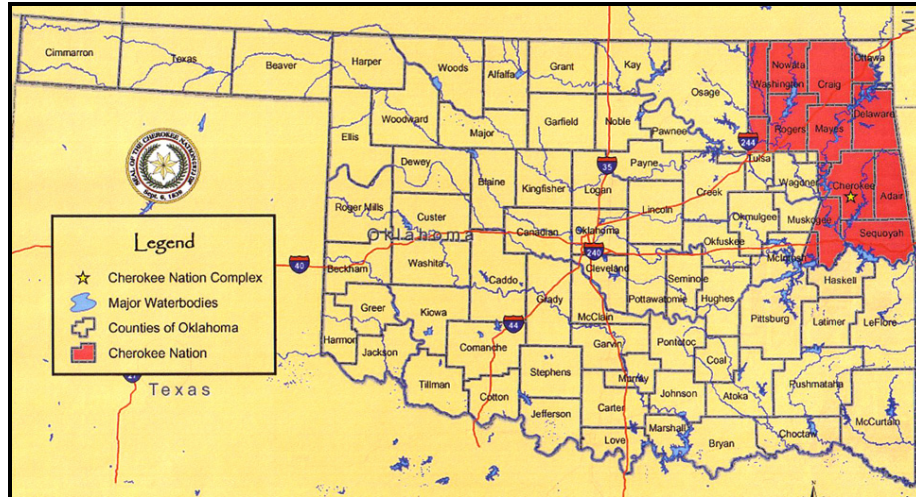
Although wind resource assessments were not conducted at Catoosa, Tahlequah, or Will Rogers Downs, our preliminary analysis suggests that sufficient wind speeds exist to power wind turbines at each of these locations. These sites have extensive electrical loads which could be eliminated by wind turbine installations. Therefore it is strongly recommended that Cherokee Nation Enterprises measure the wind in each of these areas.

Cherokee Nation Buildings in and around Tahlequah



Sequoyah High School, Talking Leaves Job Corp, and the Cherokee Nation Tribal Building Complex represent an estimated \$1.3 million electrical load. This load does not include the other buildings indicated on the above map. Our conservative estimates put this additional load at \$400,000 annually.

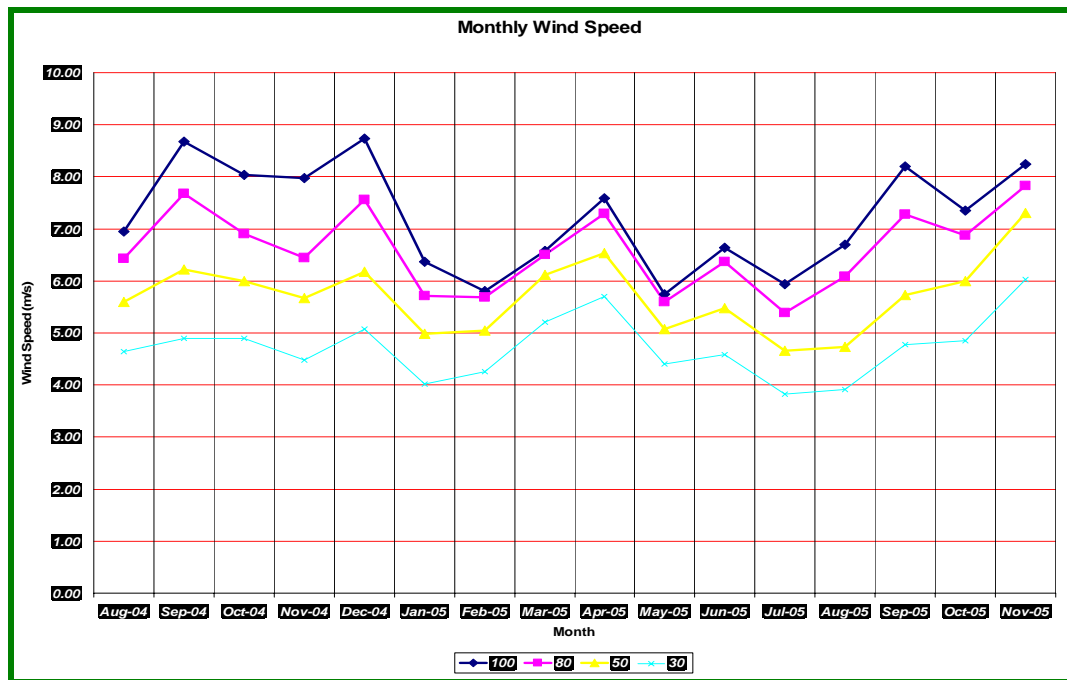
Cherokee 14-County Jurisdiction



The 14-County Cherokee Nation jurisdiction will inspire this project to seek additional Tribal and non-tribal loads. The addition of these loads, along with the formation of a CNE based Tribal Utility, will enable the bulk generation, sale, and distribution of renewable energy and its associated Green Tags.

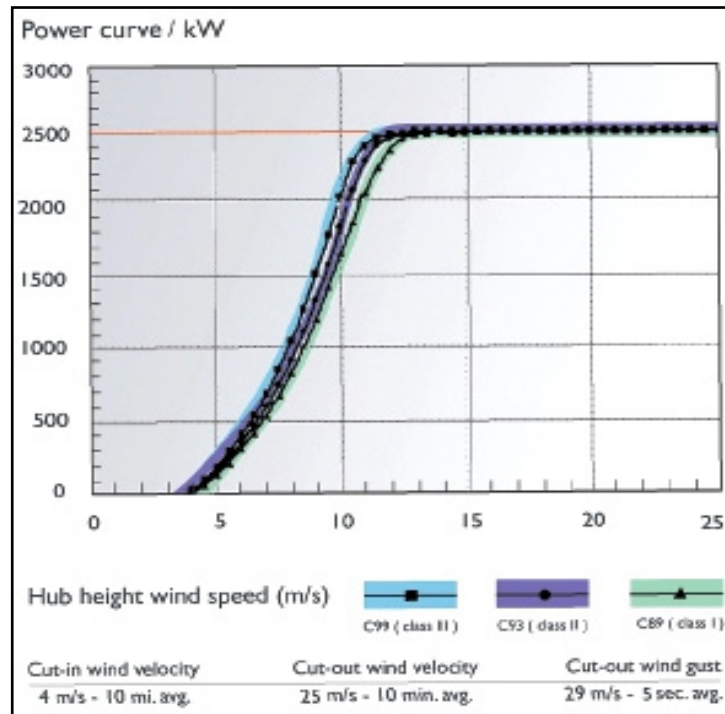
Wind Speeds

Based on the wind speeds and verification by Carol Wyatt with funds provided by the Department of Energy; the following graph represents the average wind speeds at Chilocco on a monthly basis:



These wind speeds will drive the turbine efficiency as illustrated in the Financial Projections section below.

Turbine Power Curve



This graph plots the turbine efficiency as it relates to measured wind speed. The higher the wind speed, the more power the turbine(s) will generate. The maximum power output occurs at and above 11 meters per second.

Financial Projections (As of 15 April 2006):

The following Return on Investment tables reflect the turbine efficiency as it pertains to average monthly wind speed and the resulting power output. There are two (2) separate ROI tables. The first one is the wind speed measured at 80 meters. The ROI table on the next page represents the power coefficients for the wind speeds measured at 100 meters. The installed capacity is the maximum amount of power the turbines would generate if the wind speeds were in excess of 11 meters per second.

ROI Tables for 80 and 100 Meters

Number of [Clipper Wind C-99](#) 2.5 Megawatt Turbines Installed / Installed Capacity¹⁰ (Megawatts)

Click on above link for Clipper Wind Brochure			1	12	16	20	40
Wind Speed in m/s ¹¹ @ 80m	Turbine Efficiency Coefficient ¹²		2.5	30	40	50	100
			Estimated Project Costs @ \$1,250,000 per Megawatt* (in millions)				
			\$ 3.125	\$ 37.5	\$ 50	\$ 62.5	\$ 125
			Total Output in Megawatts				
JAN	5.72	0.200	365	4,380	5,840	7,300	14,600
FEB	5.68	0.299	546	6,548	8,731	10,914	21,827
MAR	6.50	0.281	513	6,154	8,205	10,257	20,513
APR	7.29	0.396	723	8,672	11,563	14,454	28,908
MAY	5.59	0.181	330	3,964	5,285	6,607	13,213
JUN	6.37	0.270	493	5,913	7,884	9,855	19,710
JUL	5.38	0.164	299	3,592	4,789	5,986	11,972
AUG	6.43	0.276	504	6,044	8,059	10,074	20,148
SEP	7.68	0.436	796	9,548	12,731	15,914	31,828
OCT	6.90	0.320	584	7,008	9,344	11,680	23,360
NOV	7.82	0.472	861	10,337	13,782	17,228	34,456
DEC	7.56	0.432	788	9,461	12,614	15,768	31,536

Annual Total Output in Megawatts¹³	6,802	81,621	108,828	136,036	272,071
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Annual Potential Income / kWh

Power ¹⁴	\$0.027	\$ 183,648	\$ 2,203,775	\$ 2,938,367	\$ 3,672,959	\$ 7,345,917
Green Tags ¹⁵	\$0.020	\$ 136,036	\$ 1,632,426	\$ 2,176,568	\$ 2,720,710	\$ 5,441,420
Production Tax Credits ¹⁶	\$0.013	\$ 85,022	\$ 1,020,266	\$ 1,360,355	\$ 1,700,444	\$ 3,400,888
TOTAL ESTIMATED ANNUAL INCOME	\$ 404,706	\$ 4,856,467	\$ 6,475,290	\$ 8,094,112	\$ 16,188,225	
ROI - In Years¹⁷	7.72	7.72	7.72	7.72	7.72	
ROI - Years 7.73 through 20	\$ 4,969,112	\$ 59,629,347	\$ 79,505,796	\$ 99,382,245	\$ 198,764,490	

Annual Potential Savings & Income /kWh

Tribal Load Offset ¹⁷ (savings)	\$0.081	\$ 550,944	\$ 6,611,325	\$ 8,815,100	\$ 11,018,876	\$ 22,037,751
Green Tags	\$0.020	\$ 136,036	\$ 1,632,426	\$ 2,176,568	\$ 2,720,710	\$ 5,441,420
Production Tax Credits	\$0.013	\$ 85,022	\$ 1,020,266	\$ 1,360,355	\$ 1,700,444	\$ 3,400,888
ESTIMATED ANNUAL OFFSET and INCOME	\$ 772,001	\$ 9,264,018	\$ 12,352,023	\$ 15,440,029	\$ 30,880,059	
ROI - In Years	4.05	4.05	4.05	4.05	4.05	
ROI - Years 4.06 through 20	\$ 12,315,029	\$ 147,780,351	\$ 197,040,468	\$ 246,300,585	\$ 492,601,170	

* This is an Industry Standard. Our price per Megawatt will vary and will be computed on the Project Cost Analysis Sheet.

Please refer to the footnotes below the 100 meter ROI of an explanation of terms.

Number of [Clipper Wind C-99](#) 2.5 Megawatt Turbines Installed / Installed Capacity¹⁰ (Megawatts)

Click on above link for Clipper Wind Brochure			1	12	16	20	40
			2.5	30	40	50	100
Turbine Efficiency Coefficient ¹¹			Estimated Project Costs @ \$1,250,000 per Megawatt* (in millions)				
			\$ 3.375	\$ 40.5	\$ 54	\$ 67.5	\$ 135
			Total Output in Megawatts				
Wind Speed m/s ¹² @ 100m							
	6.37	0.254	464	5,563	7,417	9,271	18,542
FEB	5.81	0.208	380	4,555	6,074	7,592	15,184
MAR	6.58	0.288	526	6,307	8,410	10,512	21,024
APR	7.59	0.436	796	9,548	12,731	15,914	31,828
MAY	5.74	0.212	387	4,643	6,190	7,738	15,476
JUN	6.64	0.280	511	6,132	8,176	10,220	20,440
JUL	5.94	0.204	372	4,468	5,957	7,446	14,892
AUG	6.69	0.284	518	6,220	8,293	10,366	20,732
SEP	8.20	0.560	1022	12,264	16,352	20,440	40,880
OCT	7.35	0.372	679	8,147	10,862	13,578	27,156
NOV	8.25	0.564	1029	12,352	16,469	20,586	41,172
DEC	8.73	0.641	1170	14,038	18,717	23,397	46,793

Annual Total Output in Megawatts¹³	7,853	94,236	125,648	157,060	314,119
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Annual Potential Income / kWh

Power ¹⁴	\$0.0270	\$ 212,030	\$ 2,544,364	\$ 3,392,485	\$ 4,240,607	\$ 8,481,213
Green Tags ¹⁵	\$0.0200	\$ 157,060	\$ 1,884,714	\$ 2,512,952	\$ 3,141,190	\$ 6,282,380
Production Tax Credits ¹⁶	\$0.0125	\$ 98,162	\$ 1,177,946	\$ 1,570,595	\$ 1,963,244	\$ 3,926,488
TOTAL ESTIMATED ANNUAL INCOME	\$ 467,252	\$ 5,607,024	\$ 7,476,032	\$ 9,345,040	\$ 18,690,081	
ROI - In Years¹⁷	7.22	7.22	7.22	7.22	7.22	
ROI - Years 7.23 through 20	\$ 5,970,040	\$ 71,640,483	\$ 95,520,644	\$ 119,400,805	\$ 238,801,610	

Tribal Load Offset ¹⁸ (savings)	\$0.0810	\$ 636,091	\$ 7,633,092	\$ 10,177,456	\$ 12,721,820	\$ 25,443,639
Green Tags	\$0.0200	\$ 136,036	\$ 1,632,426	\$ 2,176,568	\$ 2,720,710	\$ 5,441,420
Production Tax Credits	\$0.0125	\$ 85,022	\$ 1,020,266	\$ 1,360,355	\$ 1,700,444	\$ 3,400,888

ESTIMATED ANNUAL OFFSET and INCOME	\$ 857,149	\$ 10,285,784	\$ 13,714,379	\$ 17,142,973	\$ 34,285,947
ROI - In Years	3.94	3.94	3.94	3.94	3.94
ROI - Years 3.95 through 20	\$ 13,767,973	\$ 165,215,679	\$ 220,287,572	\$ 275,359,465	\$ 550,718,930

* This is an Industry Standard. Our price per Megawatt will vary and will be computed on the Project Cost Analysis Sheet.

**The price for installing turbines at 100 m will be higher due to crane availability and will be computed on the Project Cost Analysis Sheet.

¹⁰ Total power available from all turbines when operating at 100% efficiency.

¹¹ Turbine Efficiency Coefficient = Percent of output for a 2.5 megawatt Turbine.

¹² Wind Speed in m/s (meters per second) = meters per second x 2.236 = miles per hour.

¹³ The amount of power, in millions of watts, produced by multiplying the turbine efficiency by the total installed capacity.

¹⁴ Estimated price per kilowatt hour expected for the sale of our renewable energy.

¹⁵ Estimated price per kilowatt hour expected from Green Tag sales.

¹⁶ Estimated price for the PTC pass-through as sold to a third party for their tax credit appetite.

¹⁷ How long it will take (exclusive of the cost of money) to payback the project based on Annual Potential Income.

¹⁸ Estimated savings based on using our generated electricity instead of paying for the power provided to us by the utilities.

Market Environment

There is substantial growth occurring in the 14-County jurisdictional area of Cherokee Nation. The estimated population of this area is 359,506¹⁹ and the area is experiencing an estimated 2.7 % annual growth rate. This means the demand for electricity will increase as well. At the moment there is very little new electrical generation planned in Oklahoma. Under the direction of Cherokee Nation Enterprises and the wind energy project, we will seek out and market to housing developments, large industrial and commercial loads, corporations that require carbon emission reductions; and other entities which require the purchase of electricity. Cherokee Nation Enterprises enjoys an outstanding reputation in Northeastern Oklahoma so there may be significant market advantage by branding the renewable energy CNE generates.

Internet

The Internet will provide several opportunities to market our power, as well as our Green Tags. The core concept of this marketing strategy is to centralize the information about our project:

- Live streaming video from the actual wind farm.
- Real-time production data.
- Green Tag purchase options.
- Value added marketing for socially-relevant program.
- Project's cultural impact.
- CNE and Tribal history.

Utilities

Diligent research will determine the potential to market to utilities, electric co-operatives, and local power authorities. The Power Purchase and Interconnect Agreements will be the key contracts driving our profit.

State and Federal Agencies

The introduction of several Renewable Portfolio Standards²⁰ will provide this project the opportunity to market to state and federal customers. CNE's business strength could easily effectuate these relationships.

Local and Tribal Loads

The key to any business venture is to maximize your profit. By providing electricity to local loads²¹ you actually replace the electricity for which you would pay retail rates with the electricity you generate at a lower cost.²² **In the case of using our own generated electricity to offset our load(s); we will actually *save* an estimated 8.1 cents per kilowatt hour rather than *sell* a kilowatt for 2.7 cents.** This results in a realized increase of 5.4 cents per kilowatt hour for the life of the project. (See ROI Tables on Page 12.)

Distributed Loads

Traditionally a distributed load will take advantage of a local utility, co-op, or power authority's existing lines of electrical distribution to its existing customer base. The advantages of providing our renewable energy for distributed loads are as follows:

- Provides a wholesale or retail outlet for the power we do not use to satisfy our Local Loads.
- Develops a working relationship with power providers in the area.
- Gives local power providers a chance to offer renewable energy to their customer base.

Relationship building is the key to success in this market. CNE, Carol Wyatt, and the CNE Tribal Contacts will provide adequate access to establish these markets.

¹⁹ http://www.census.gov/popest/archives/2000s/vintage_2001/CO-EST2001-12/CO-EST2001-12-40.html

²⁰ See "An Explanation of the Renewable Portfolio Standard"; Appendix Page 49

²¹ Examples of Local Loads are: The Casino and Resort at Catoosa; Will Rogers Downs; The Tribal Building Complex in Tahlequah; The Port of Catoosa.

²² See ROI Tables on Page 14

Production Tax Credit Pass-Through²³

Production Tax Credits (PTC's) are available for all installed wind farms. PTC's are generated when the project sells electricity to a third party, such as a utility or co-op. Because Cherokee Nation Enterprises does not have a tax appetite, it would be beneficial for the project to secure funding from a source which does. The current price for PTC's is 1.8 cents per kilowatt hour. Several potential funding sources are willing to purchase these PTC's at an average of 1.3 cents per kWh. This can result in significant income for the project. (See ROI Tables on Page 14)

Green Tags

Green Tags are created when wind power or other renewable energy is substituted for traditional power. The result is a shift away from our dependence on burning fossil fuel to produce electricity. Using clean renewable energy is friendly to the environment and reduces emissions of carbon dioxide and other greenhouse gases. Green Tags represent the real savings in carbon dioxide and other pollutants that occur when green power replaces burning fossil fuel.

Renewable energy is still slightly more expensive than buying traditional power, so Green Tags are purchased in addition to the electricity that you are now using. Buying Green Tags has the same effect as buying green power. Both replace fossil fuel generators with clean renewables, and both have exactly the same environmental benefits.

Green Tags are at a premium in Oklahoma. OG&E is, and has been completely sold out since January 1, 2006.²⁴ When available, OG&E are selling their Green Tags for 2 cents/kWh. This Green Tags sell price is reflected in the ROI Tables (see page 14.) Research indicates Native American real-time generated Green Tags are worth more than 2 cents per kilowatt. This needs to be market tested. At the moment, the demand for Green Tags in the State of Oklahoma has out-paced the supply.

There is also the potential to co-market socially-relevant Tribal programs with the sale of the Green Tags. Some of these programs may include, but are not limited to:

- Health-related programs such as: diabetes; drug / alcohol; or teenage pregnancy.
- Energy efficiency for the elderly and infirm.
- Educational programs.
- Job training.

The potential is only limited by the needs and imagination of Cherokee Nation Enterprises. The concept is to market these programs concurrently with our Green Tags. The potential buyer will simultaneously be exposed to the additional opportunities at the point of purchase.

The best way to market the Green Tags, along with the socially-relevant programs, is to sell them through a 501-(c)3. The purchaser will immediately be able to take a tax deduction. This will give our project a distinct market advantage. *“Would you rather spend 2 cents and feel good about greening up our environment, or spend 2 cents; feel good about greening up our environment; and take a tax deduction?”*

²³ See Production Tax Credit Letter Appendix Page 61

²⁴ See OG&E Wind Power Residential Sign-Up; Appendix Page 63

Wind Project Management Team

[David Stewart](#) – President / CEO Cherokee Nation Enterprises

[Shawn B. Slaton](#) – CFO Cherokee Nation Enterprises

[Carol Wyatt](#) – Project Manager

[Joseph Brignolo](#) – Project Developer

[Scott Williamson](#) – IT Specialist

(Click on any **[linked](#)** name above to view résumé.)

The project management team currently in place is experienced and sufficient for The Cherokee Nation Enterprises Wind Energy Development process. The management team will be expanded as we enter purchase and construction stages; we will add personnel to handle the day-to-day management of operations, while the current team oversees general project development.

Objectives

General

The short-term goal of Cherokee Nation Enterprises Wind Development Project is to generate enough electricity, or income from the installation of a wind farm, to offset the entire Cherokee Nation load including expansion and growth.

The medium-term goals are to generate enough extra electricity to sell to industrial, commercial, and residential loads.

The long-term goal of Cherokee Nation Enterprises Energy Development is develop sufficient expertise to be an industry leader in Native American Wind Energy Development throughout the United States. Based on our success with the development of six casinos in Northeast Oklahoma, CNE has excelled in business model development and execution. See: <http://www.cherokeecasino.com/home/index.aspx>.

To accomplish our goals we have developed a comprehensive and phased growth strategy that will build our organizational structure and solidify our stature in the industry.

First year:

- Secure verified wind and geographical data to develop an appropriately-sized wind farm, in the North Central part of the state on the Chilocco property:
- Evaluate other sites to install wind turbines to satisfy high density local and distributed loads.
- Design wind farm and determine project size.
- Conduct wind resource assessments in areas chosen to satisfy local and distributed loads
- Start and complete Avian and Environmental Studies at Wind Farm site.
- Start and complete electric transmission, interconnect, and power purchase study for wind farm.
- Start interconnect, and power purchase agreements for local, distributed loads.
- Complete Wind Farm Project Cost Analysis for Wind Farm.
- Assign Project Responsibilities for Wind Farm Development.
- Contact other commercial, industrial, and residential local loads for possible power sales.
- Contact transportation and construction companies for erection.

- Initiate Tribal Utility.
- Verify turbine selection and place turbine order.
- Install turbine foundations for wind farm and wind farm expansion.

Second year:

- Verify wind data collected at sites to satisfy local and distributed loads.
- Complete interconnect, and power purchase agreements for local and distributed loads.
- Continue developing Tribal Utility.
- Market power generation to commercial, industrial, and residential local loads.
- Verify turbine selection and place turbine order for local and distributed projects.
- Develop socially relevant programs to compliment our Green Tag sales.
- Design and Develop Web site for Green Tag and power sales.
- Finalize marketing plans with partners and the public for Green Tag sales.
- Research and plan operation and maintenance facility near wind farm in Chilocco.

Third year:

- Complete wind farm project at Chilocco.
- Re-evaluate power customer base and market expansion to determine wind farm expansion.
- Analyze previous project development successes and failures and restructure development plans for local and distributed projects.
- Go live with Green Tag web site marketing.
- Plan and develop distributed and local load wind energy projects. These projects should coincide with the expansion of the wind farm (if applicable) to take advantage of the economy of scale.
- Complete Wind Farm Project Cost Analysis²⁵ form for wind farm expansion, local and distributed loads.
- Assign Project Responsibilities for wind farm expansion, local and distributed loads.²⁶
- Verify turbine selection as it pertains to recorded wind speeds at local and distributed loads.
- Contract with foundation, transportation, and erection companies.
- Install turbine foundations for local and distributed loads.
- Evaluate Tribal Utility progress and fine-tune accordingly.
- Develop, construct, and staff operation and maintenance training facility near wind farm at Chilocco.

Fourth year:

- Erect turbines at wind farm expansion, local and distributed load centers.
- Re-evaluate and adjust Green Tag marketing approach and socially-relevant programs.
- Develop plans for expanding wind farms to other locations.
- Evaluate Tribal Utility progress and adapt accordingly.
- Research customer base and expand power-delivery market.
- Develop local and State interest to expand Cherokee Nation Enterprises Energy Development generation in other areas of Oklahoma.
- Maintain and manage existing wind projects to maximize profit.

Based on current Cherokee Nation, local, and state energy needs, CNE's current level of expertise, and expanding market, we are confident that these objectives are both realistic and achievable.

²⁵ See Wind Farm Project Cost Analysis; Appendix Page **Error! Bookmark not defined.**

²⁶ See Project Pre-Execution Checklist and Assignments; Appendix Page 64.

Management

The concept of Cherokee wind energy was founded by Mrs. Carol Wyatt who, after successful grant applications, found a tremendous wind resource capable of powering the Cherokee Nation facilities, and its subsidiaries in Northeastern Oklahoma. Interpolating this wind resource to provide renewable energy at additional locations is planned for this year.

Cherokee Nation Enterprises Energy Development (CNEED) is a division of Cherokee Nation Enterprises, a wholly-owned corporation, incorporated under the laws of the Cherokee Nation. The leadership and alignment characteristics of CNEED, has produced a team with broad and flexible management skills. More importantly, this team has a proven record of success.²⁷ Cherokee Nation Enterprises has built a wind energy development team capable of successfully completing of all phases of this project.

Assignment of Responsibilities

Carol Wyatt, Cherokee Wind Energy Project Manager

- Management of day-to-day project operations, including management of all Cherokee Nation and Tribal entity relationships.
- Develop and secure additional project management talent from within the Tribe.
- Provide seamless interface between project and all entities of Cherokee Nation.
- Accounting interface between project and CNE financial group.
- All reporting functions for grants and CNE interfaces.
- Manage project planning and development.
- Preliminary research for grants and other funding sources.
- Access project systems by modem and retrieve data from SoDAR.
- Prepare wind grid charts as needed for resource verification.
- Responsible for reporting to CEO / CFO, as well as required grant reports.
- Track finances and expenditures on project and in-kind contributions.
- Set deadlines, assign responsibilities; monitor and summarize progress of project.
- Liaison for all activities with: vendors, Cherokee Nation, CN OES Dept., CN Accounting, CN Realty Department, Chilocco property Lessee, electrician, Chamco, SBC, Atmospheric Systems (Dr. Ken Underwood), CNE: Accounts Payable; Buyers; I.T. Techs; CNB Business Development; Kaw Nation Utility Commissioner; U.S. DOE (U.S. Dept. of Energy); NREL (National Renewable Energy Lab).
- Anticipate and troubleshoot problems and coordinate activities to solve them.
- Prepare articles for public information.
- Research for additional funding for wind energy project.
- Collect electric bills from all Cherokee Nation Enterprises, Cherokee Nation, and Cherokee Nation Industries facilities and prepare spreadsheets for project expansion.
- Work with Wind Energy Consultant(s) for CNE wind energy development
- Attend workshops / seminars necessary for the success of the wind energy project.
- Manage DOI – Mineral Assessment Program Grant (BIA)

²⁷ See “From Bingo to Poker” PowerPoint Presentation at: <ftp://cne:chilocco@ftp.brignolo.net/From%20Bingo%20to%20Poker.ppt>

Joseph Brignolo, Project Developer

- Leadership and direction for organizational infrastructure and design, contractor acquisitions, and logistics.
- Identify process improvements, organizational design refinements, and operational efficiencies.
- Day to day interface with utilities, suppliers, transportation and erection companies, turbine manufacturers, engineers, and miscellaneous vendors.
- Supervise project schedule.
- Responsible for vendor and contractor relationships.
- Financial reporting as needed to CFO, CEO, and Project Manager.

David Stewart, President / Chief Executive Officer, Cherokee Nation Enterprises

- Oversee Tribal Utility Commissioner
- Contract approval in conjunction with the CFO and the CNE Board.
- Fiscal responsibility for project.

Shawn Slaton, Sr. Vice President / Chief Financial Officer, Cherokee Nation Enterprises

- Project financial responsibility and control.
- Contract approval in conjunction with CEO and CNE Board of Directors.
- Financial liaison between project and Cherokee Nation Enterprises Board of Directors.

Scott Williamson, IT Specialist Cherokee Nation Enterprises

- Support and coordination for computer and telecommunications systems.
- Responsible for the installation, testing, operation, maintenance, training and problem resolution of SoDAR equipment and related databases / software
- Collect and analyze data to monitor measurement equipment as well as preparing data for internal and external reporting.
- Write and / or maintain technical documentation and procedures.

People / Talent Required in Support of Operations

The CNEED team recognizes additional staff will be required to properly develop renewable energy projects and market the associated Green Tags. We further recognize, as we embark on other wind project developments, we will need greater geographical representation and expanded research and marketing capability. Cherokee Nation Enterprises Energy Development will rely on three strategies to satisfy its need for additional staff:

1. **Direct Hires**, i.e., the recruiting and hiring of the highest quality professionals to support our integrated capabilities. During our wind development project, we plan to recruit and hire:
 - a. On-site Project Manager
 - b. Construction Supervisor
 - c. Logistics Manager
 - d. Civil Site Superintendent
 - e. Security Officer
 - f. Project Accountant
 - g. Web Site Designer
 - h. Travel, Lodging, and Meals Coordinator

During expansion, we plan to hire and recruit professionals who will provide:

- a. Market Research
 - b. Transmission Analysis
 - c. Education and Training Programs
2. **Contract Support Services**, i.e., outsourced support services contracted to work in support of CNEED operations. For the immediate future, we plan to continue to contract out the following operations:
- a. Environmental Engineer Consultant:
Complete study for the compliance of all necessary environmental issues including: Avian Study; Environmental Impact Study; and other studies necessary to comply with the Environmental Protection Agency (EPA), and National Environmental Policy Act (NEPA).²⁸
 - b. Civil Engineer:
Design wind turbine generator (WTG) layout including roads, storm water, etc.
 - c. Electrical Engineer:
Balance of electrical plant, grid connection, grounding system, and power collection.
 - d. Construction and Transportation Company:
It makes economic and logistical sense for the transportation and construction companies to be the same. The responsibility for the delivery of the turbine, blades, and tower sections must coincide with the erection schedule. If the project contracts with separate companies, it may experience delays for which the project will be fiscally responsible.
 - e. Operations Manager:
Coordination of local skilled and unskilled labor. Interfacing with Travel, Lodging, and Meals Coordinator to ensure seamless interfacing between contracted suppliers, and local project logistics.
3. **Associated Teaming Arrangements**, i.e., cooperative teaming arrangements for the suppliers and contractors, erection, construction and transportation companies. Current arrangements have been solidified but not formalized with:
- Clipper Wind, Turbine Manufacturer
<http://www.clipperwind.com/techspecs.php>
 - Barnhart Crane and Rigging, Transportation and Erection
<http://www.barnhartcrane.com/>
Contact: Daniel Phipps, 503-281-7433
 - WECS Electric, Electrical Cable, and BOP Supplier
<http://wecselectric.net/>
Contact: Roger Lauricella, 760-251-0040
 - Kaeding and Associates, Professional Electrical Engineer
7300 France Avenue South, Suite 330
Minneapolis MN 55435
Contact: Paul Kaeding, 952-831-0317

²⁸ See: <http://www.epa.gov/compliance/nepa/index.html>

- SecondWind, SCADA – Wind Farm Monitoring Systems
<http://www.secondwind.com/products/windfarmscada.shtml>
Contact: James Schwartz, 617-776-8520
- Williams Form Engineering, Foundation Bolts
<http://www.williamsform.com/>
Contact: Tom Bird, 888-762-5265
- Patrick and Henderson, Foundation Design and Engineering
1965 Airport Dr., Bakersfield CA 93308
Contact: Allan Henderson, 661-391-9854

Concept of Operation

Operational Strategy

The tenets of our strategy are:

1. Maximize the economic benefit of our renewable energy project by using the power generated to reduce or eliminate our Tribal load.
2. Use synchronous marketing strategies to sell our Green Tags at retail.
3. Identify and develop socially relevant Tribal programs, which will be marketed along with the Green Tags.
4. Continue to explore other renewable energy opportunities by identifying large local or distributed loads and measuring the wind resource at each identified location. These opportunities will include, but not be limited to: tribal; commercial; industrial; state and government; and residential.
5. Continue to reduce operating and construction costs by capitalizing on effective project management, and utilizing Tribal companies and labor at every reasonable opportunity.
6. Working our economy of scale to combine our wind projects for maximum ROI.
7. Seek partners to sell / buy our unused Production Tax Credits.

Cherokee Nation Enterprises Energy Development

Prior to the construction phase of our first wind project, CNEED will complete the development process. The details of the development phases are as follows:

Phase One – *Plan all stages of construction; secure all contractual obligations; complete Wind Farm Project Cost Analysis; and pinpoint ROI.*

- Secure an estimated \$550,000 for project development costs.
- When funds are secured:
 - Conduct Transmission and Interconnect Study.
 - Negotiate Interconnect and Power Purchase Agreement.
 - Determine project size (in megawatts).
 - Complete Wind Farm Project Cost Analysis.

- Conduct Environmental, Avian and NEPA Studies.
- Conduct soil sampling and design turbine foundations.
- Complete turbine assessment and selection.
- Design turbine layout.
- Design turbine communication system.
- Layout electrical and civil engineering.

Transition to Phase Two when above items are complete.

Phase Two – *Finalize Financial, Interconnect, and Power Purchase contractual agreements.*

- Secure funding commensurate with project size: Each megawatt equals about \$1.25 – 1.6 million to buy and install.
- Secure an estimate, contract, and order wind turbines.
- Complete negotiations on the Interconnect and Power Purchase Agreement.
- Negotiate and schedule turbine transportation and erection.
- Install turbine foundations.
- Design electrical collection and create Bill of Materials (BOM).
-

Transition to Phase Three when all contracts are signed and cost estimates are firm.

Phase Three – *Construct and Commission Project.*

- Erect and connect project.
- Commission turbines.
- Start real-time marketing of Green Tags and generated power related products.

Transition to Phase Four at anytime during Phase Two, or Phase Three, as long as the operating paradigm is fully functional.

Phase Four – *Expand business unit and customer base.*

- Formalize a separate business unit which will act as a wind energy development company.
- Use our expertise to develop additional projects in:
 - Other locations in Oklahoma;
 - Tribal Nations;
 - Wind-rich areas of the United States;
 - International locations where Government-to-Government relationships prosper.
- Secure industry partnerships for wind turbine operation and maintenance training center.

“S.W.O.T” Analysis

Cherokee Nation Enterprises is developing its first renewable energy project. As we develop our working relationship with our vendors and contractors, we will hone our operations to expand our economic advantage. We will also expand our reputation and influence in the energy industry. Since CNE will not limit itself to strictly developing wind energy locally, the potential for growth is excellent to outstanding.

The market for wind energy has been, is, and will continue to be strong. This is evident by the 475 megawatts already installed in Oklahoma,²⁹ as well as the 9,149 megawatts installed nationwide.³⁰ Based on

²⁹ See Oklahoma Wind Energy Development ; Appendix Page 43

³⁰ AWEA map of U. S. Installed wind power by States. See Appendix Page 44

the 50,428 megawatts of electricity consumed in Oklahoma in 2003³¹ the State's renewable energy penetration is less than 1%. The Renewable Portfolio Standard for the United States is: All Federal Government facilities must purchase at least 10% of their as renewable energy by year 2020.³² As mentioned earlier, the wind penetration state wide is less than 1%. The geographic area in which CNE will install a commercial utility scale wind farm is in the north-central part of the state on the Chilocco property. To date, there has not been a Native American owned and operated *commercial scale wind farm* installed anywhere. CNE has the opportunity to be the first. The key to our success is the ability to develop excellent working relationships with the utilities and electric co-ops which operate in our 14-county area. Our reputation as a successful and respected gaming enterprise lends extreme credibility to this new business opportunity. Cherokee Nation Enterprises has and will continue to develop solid working relationships with utilities, co-ops, consultants, engineers, turbine manufactures, and transportation and erection companies. The approach to this wind energy project is essentially two related and simultaneous business models:

- A commercial scale wind farm for wholesale electricity; and
- Satisfying local and distributed loads to reduce Tribal energy costs.

Each of these business models will provide the project with additional income from the sale of Green Tags and Production Tax Credits.

The greatest threat to the success of any wind project is the accurate verification of wind data and the resulting turbine performance. The resulting power output from the turbines (based on the verified wind speeds and direction) determine the interconnect and power purchase agreements. These agreements are needed to connect the projects to the electric grid to sell or distribute the electricity we generate. Success requires us to fine-tune our position with the utilities and electric co-ops, as well as strengthen and maintain our vendor and contractor base, or we can seriously dilute our Return on Investment (ROI). Therefore, we must be prepared to develop and maintain a diverse and deep network of contractors and suppliers. Further, we must be able to capitalize on the latest internet and e-commerce technologies to market our Green Tags. CNE has created the necessary contractor and supplier networks and is leveraging those services to ensure an excellent position to establish itself as the premier Native American wind energy Development Company in Oklahoma, as well as the United States.

Strengths

In general Cherokee Nation Enterprises Energy Development's parent company, Cherokee Nation Enterprises, has several strengths that put our project an excellent position to prosper and grow. First, it has significant financial strength and credit rating to finance the wind project(s) without seeking additional investors. This gives us the flexibility of acting immediately when economic opportunities present themselves. The growth of the wind industry has been consistent for more than 20 years. There are several driving forces which ensure the continued growth of the wind industry. First, there is the passing and perpetuation of the Production Tax Credit (PTC).³³ Although CNE and the Cherokee Nation enjoy a tax exempt status, these PTC's are tradable to those entities which have a tax credit appetite. At full retail value, these PTC's are currently worth 1.8 cents per kilowatt hour. Since the inception of this project we have had several offers to purchase the unused PTC's at between 70 – 85 % of retail. A 30 – megawatt project built in the Chilocco area (where we have successfully measured the wind speeds in excess of 6.38 meters per second) suggests additional estimated annual income from the sale of PTC's to be \$ 1,026,496.³⁴ Currently

³¹ http://www.eia.doe.gov/emeu/states/sep_fuel/html/fuel_es.html See Oklahoma Electricity Consumption – 2003; Appendix Page 47

³² See Analysis of a 10-percent Renewable Portfolio Standard; Appendix Page 68

³³ See AWEA article: U.S. Senate Passes Renewable Portfolio Standard; Appendix Page 52.

³⁴ 30 megawatts x 31% (turbine efficiency) x 1.8 cents x 70% x 8760 hours in a year.

the average price of a Green Tag is 2 cents per kilowatt hour nationwide.³⁵ Based on the same wind data and turbine efficiency used for calculating the “pass through” price of the PTC’s from the 30 megawatt wind farm at Chilocco, we will realize an annual Green Tag income of an additional \$ 1,632,426 (estimated). Further improving success, research indicates our potential energy buyers (utilities and electric co-ops) have fallen short of renewable energy penetration (10%) in their markets and on their grids.³⁶ More importantly, CNE has taken a leadership role by being the first Tribe in the Oklahoma and the United States to propose a Tribally-owned and operated utility scale wind farm.

The second strength CNE enjoys is its carefully-selected and well-established network of suppliers and contractors. The wind industry is a very close knit fraternity of engineers, transportation and erection companies, electrical suppliers, foundation companies, and turbine manufacturers. Carol Wyatt and Joseph Brignolo have taken the proper steps to secure the best suppliers and contractors who have been selected for their knowledge, expertise, and reputation in the wind business. In addition to vendor and subcontractor agreements we have honed our marketing and sales strategies (evidenced by our successful casino operations) to maximize profit.

The third and most important strength is our operating paradigm. CNE’s main focus is operational profit. This focus has driven us to self perform all aspects of project development and management training. CNE has the financial strength and organizational support of its Board of Directors and the Cherokee Nation Tribal Council and has recognized operating autonomy on similar projects. Our superb training programs, coupled with a driven, readily available workforce, ensure long-term success. Typically, all the feasibility and development costs of wind projects are spent retaining large wind development companies. CNE’s wind development business unit possesses the skill set needed to perform all tasks and responsibilities associated with developing, designing and building these wind energy projects. A common profit margin for an established wind development company is between 75-100%. With a substantial self-performance capability CNE will preserve that profit, as well as continue to develop our expertise.

A list of specific strengths includes:

- Qualification of Vendors and Contractors
- Maximizing Operating Profits
- Project Development and Management flexibility.
- Successful Operational Paradigm
- Financial

The combination of a strong statewide and national renewable energy market; high cost of Tribal local and distributed load(s); excellent project development and management; reliable supplier and contractor relationships; and innovative marketing strategies will ensure success of this project for CNE.

Weaknesses

CNE has never developed, designed, or installed a renewable energy project. As such, it is exploring wind development in North-central and Northeastern Oklahoma for the first time. The most significant disadvantage of our inexperience is obtaining commercial financing for energy projects. Initially, we will rely on internal funding for the development stages of our wind energy project. However, as we transition from the development stage to the purchase of equipment and supplies, transportation and erection stages, we

³⁵ <http://www.b-e-f.org/GreenTags/index.cfm>

³⁶ See Western Farmers Electric Co-op; Appendix Page 44, and OG&E Wind Power Residential Sign-Up (https://secure.oge.com/contracts/rc_wind_power_signup.asp) Appendix Page 63.

will need to demonstrate our fiscal abilities in a more tangible way. Turbine selection contracts and ordering will require an initial payment of 20-33% of the total cost of the turbines. This payment could be in excess of \$4.3 million for a 30 megawatt project and \$7.2 million for a 50 megawatt project. These funds are used as a down payment and will not work for us until the project is installed and commissioned. Typically, the project would borrow this money and include the interest in the financial analysis. It would be more economical for us as our own project developers to self-fund this phase of the project. The downside is tying up that capital in lieu of reinvesting it in our existing enterprises. However, there may be tremendous cost savings in not seeking commercial loans for this project. On the other hand the addition of the appropriate outside commercial financing will ensure the success of the Production Tax Credit pass-through. There is a concern that without internal commitment to this project and the lack of credibility in wind energy development, we could not obtain commercial financing and the project would fail. If outside financing is required, this weakness can be mitigated by applying to the Rural Utility Service for an Electrification Loan at an average of 4.5% interest.³⁷

Grant funds allowed us to start and complete a feasibility study; however, for this size project, we can't rely on grant funding to sustain this wind energy project long-term.

The second and more manageable weakness we have is, lack of specific wind development expertise. Fortunately, this project has demonstrated certain skills and expertise in collecting meteorologically validated wind data, as well as surrounding itself with known and competent wind energy consultants. Similar to most good businesses, CNE has the innate ability to seek expertise where needed, if not available internally.

Being a new venture, we will continue to adapt and refine our organizational design and operating procedures to accommodate the ebb and flow of wind energy development. We have already identified specific goals for the development phase. Most pressing of these goals is to secure funding.

A list of specific weaknesses includes lack of:

- Experience
- Commercial Funding
- Influence in the Wind Energy Industry

Opportunities

The possibilities for growth and diversification within our 14-county jurisdictional areas, Oklahoma, and the nation are virtually unlimited. By design, the wind energy industry is driven by profit. As previously indicated, renewable energy penetration on the nation's electrical grid is behind schedule. Our Tribal load is an estimated \$8 million annually. Establishing wind energy projects strategically located to offset this load may lead to a substantial reduction of our collective electricity costs. This project does not need, nor can it use, the associated Production Tax Credits so they will be sold at near retail value to increase the return on investment for this project. Cherokee Nation Enterprises can and will market the Renewable Energy Credits or Green Tags via the internet to those of us who wish to help offset carbon emissions.

Beyond building wind farms to supply local power, there are growing opportunities for wind energy development elsewhere. To expand our business model to other areas, we will look for development opportunities that emulate our own circumstances to maximize our Return on Investment.

List of Opportunities:

³⁷ <http://www.usda.gov/rus/electric/loans.htm>

- Offsetting entire Cherokee Nation electrical load
- Satisfying local loads in key operational areas
- Developing an internationally recognized Operation and Training Center
- Define real-time Native American Green Tag market
- Providing Cherokee Nation Enterprises Energy Development to regional industries

Threats

There are four, clear-cut threats:

1. Transmission / Grid Capacity;
2. Utility and / or Electric Co-operative collaboration;
3. Green Tag buyer loyalty;
4. And market stability.

Transmission and grid capacity can and will be mitigated by the proper and necessary studies. Our preliminary research indicates a shortage of renewable energy on the northeastern section of the Southwest Power Pool grid. Therefore, any power we generate from a commercially viable, utility scale wind farm would have favor, as well as an interconnection to their system. This renewable energy demands a premium and again our research indicates a lack of green power in our distribution area.

Utility and / or electric cooperatives are notorious for rejecting change to their power structure on their systems. There are several valid reasons for this which we shall discuss during the development process. This potential threat was significantly diminished at a meeting January 25, 2006. The development team (Carol Wyatt and Joseph Brignolo) met with Joe Harris, President of Kay Electric Cooperative (<http://kayelectric.com/index.htm>). At this meeting Mr. Harris indicated that Kay Electric was willing to relocate a \$2.5 – 3 million substation they were planning to build within the next few years to accommodate our wind farm. The development team explained to Mr. Harris that we were intending to erect a 30 – 50 megawatt wind farm, and Mr. Harris said he would make allowances for the power on the grid. This does not mean that once this power is on the grid that it has a place to go, or an indication of the acceptance of the power for sale. However, the interconnection has been offered to this project, and that is the first step toward success.

Green Tags are at a premium. At the date of this writing, the OG&E web site has completely sold out of available green power “*Due to overwhelming response to our Wind Power Program, OG&E currently is sold out of wind power. To be placed on a waiting list to receive wind power, sign up using the form below. By signing up, you will be notified when more wind power becomes available.*”³⁸ Remember, that OG&E has sold out of their Green Tags. Consider the market value of Green Tags generated by the Cherokee Nation. Their market value will be further researched during the development phase of our project. Currently, the price of green power at the OG&E web site is \$.02 per kilowatt hour. Our preliminary market research indicates real-time Cherokee generated Green Tags are worth 50-100% more.

³⁸ See Oklahoma Gas and Electric Web site: https://secure.oge.com/contracts/rc_wind_power_signup.asp See Appendix Page 63.

Observations and Conclusions

Based on the analysis above, we realize our chances for success are excellent to outstanding. CNE has already taken several steps to develop a working relationship with the best consultants, engineers, turbine manufacturers, foundation companies, and electrical suppliers. Our opportunities for success are multifaceted. We have the ability to erect a commercial, utility scale wind farm, as well as build smaller projects to satisfy local and distributed loads to offset a significant Tribal load. The extra income we will generate from our PTC's and Green Tags could offset our debt service. Our development strategy is strong and purposeful. By evaluating specific geographic areas suited for wind energy production and analyzing market trends, we believe we will create a sound paradigm for managing growth. We are already in the process of evaluating new areas to erect wind turbines to offset additional, commercial, industrial, residential, local and distributed Tribal loads. The inclusion of single turbines strategically placed to reduce the Tribal energy exposure is directly related to the economy of scale we enjoy by combining the construction of these smaller projects with our utility scale wind farm development near Chilocco. We recognize the need to maintain our competitive edge by being the first Native American owned and operated wind Development Company in the country.

Résumés

DAVID STEWART

517 South 75th
Broken Arrow, OK 74014

May 2002 to Present - CHEROKEE NATION ENTERPRISES, INC., Catoosa, OK

President – Chief Executive Officer

David Stewart is Chief Executive Officer of Cherokee Nation Enterprises, Inc. (CNE), a wholly owned corporation of Cherokee Nation that manages and operates its gaming and retail enterprises located within the boundaries of Cherokee Nation. CNE currently employs over 2800 people in northern Oklahoma, making it one of the area's largest employers. CNE has experienced in excess of 30% compounded growth over the past three years, including the construction of Oklahoma's first resort gaming destination, a \$78 million project that consists of over 100,000 square feet of gaming, the addition of a 150-room hotel and the re-design of an 18-hole Perry Maxwell Signature golf course. CNE operates six casinos and one racino and is initiating expansions totaling over \$140 million at the various locations. Employment at Cherokee Nation Enterprises has nearly tripled in the past three years.

Mr. Stewart was one of the lead negotiators with the State of Oklahoma on the State-Tribal Gaming Compact, which allows electronic gaming machines at three of Oklahoma's horse racing tracks and expands the definition of Class II gaming for the tribes. In March 2004, CNE purchased Will Rogers Downs horse racing track.

Currently, the company is coordinating in excess of \$180 million in expansion projects.

Mr. Stewart also serves as a member of the Cherokee Nation Business Advisory Team and is involved in overall business diversification for Cherokee Nation.

August 2001 to May 2002 – CHEROKEE NATION INDUSTRIES, INC., Stilwell, OK

President – Chief Executive Officer

Cherokee Nation Industries, Inc. (CNI) is a wholly owned corporation of Cherokee Nation that performs manufacturing and personnel contracts for the U.S. Department of Defense and other major customers. CNI has been in business since 1969 and currently employs over 900 employees, with approximately \$90 million in annual sales.

1992-2001 – SUNBELT FIRE PROTECTION, INC., Tulsa, OK

President – Chief Operating Officer

Purchased majority interest in Sunbelt in 1992 and subsequently coordinated a successful application for U.S. Small Business Administration's Section 8(a) – Small Disadvantaged Business certification. Sunbelt became a multidiscipline subcontractor in the construction industry. Initially, Sunbelt engineered and installed fire sprinkler systems. Over the next 8 years, the company expanded its capabilities to include mechanical and electrical trades and general construction. The company experienced 50% annual growth during the most recent six years.

1978-1992 –VARIOUS ENTREPRENEURIAL SMALL BUSINESS VENTURES, Tulsa, OK

(Including six years of public accounting at major firms such as Coopers Lybrand (now Price Waterhouse Coopers) and Arthur Anderson & Co.)

EDUCATION: Master of Science-Business, Oklahoma State University, 1978
Bachelor of Arts-Business, Oklahoma State University, 1977

PROFESSIONAL CERTIFICATIONS: CPA of Oklahoma, 1978

CIVIC / SOCIAL SERVICES:

- The Oklahoma Academy for State Goals - Board of Directors
- Metropolitan Tulsa Chamber of Commerce – Board of Directors
 - Chamber’s Tulsa’s Future Oversight Committee
 - Advisory Council of Tulsa’s Young Professionals

Shawn B. Slaton, CPA

3887 N. Rice Road
Tahlequah, OK 74464
918-456-9787

2003, August to Present - CHEROKEE NATION ENTERPRISES, INC., Catoosa, OK

Chief Financial Officer / Sr. Vice President of Finance

Mr. Slaton provides oversight for finance and purchasing activities, including budgeting, financial analysis, accounting, payroll, procurement, inventory control, and warehouse (shipping, receiving and storage), for all CNE’s operational activities. He has been successful at building functional work teams for these activities and his staff has developed some very sophisticated models for tracking and making the most of CNE’s financial progress. Shawn also provides strong management and negotiation skills with regard to upgrading many of CNE’s systems, as well as negotiating and maintaining effective relationships with gaming vendors to ensure that CNE is getting the best deals possible with regard to vendor splits, etc. Mr. Slaton is heavily relied upon by the CEO for his professional judgment and negotiating skills in a wide variety of business opportunities.

2000, October to 2003 August – CHEROKEE NATION ENTERPRISES, INC., Catoosa, OK

Vice President of Finance and Administration

Oversight responsibilities for finance, purchasing, human resources, information systems, and facilities maintenance.

1997, August to 2000, September 30 – CHEROKEE NATION ENTERPRISES, INC., Catoosa, OK

Director of Finance

Hired to organize accounting departments at corporate and remote field operations, development of internal controls, financial reporting, cash management and business analysis.

1995, August to 1997, August – STATE AUDITOR AND INSPECTOR’S OFFICE OF OKLAHOMA

Senior Auditor

Senior Auditor for Minerals Management Service division. Reviewed, investigated and reported on industry’s compliance with government contracts.

1989, October to 1995, April – ALL STAR DESIGNS, INC., Norman, OK

Vice President/Chief Financial Officer

Operational and financial oversight of company. Responsible for all operational, financial and administrative functions including production, inventory, budget, finance, personnel and sales.

1985, May to 1989, October – FINLEY AND COOK, CPA’S., Shawnee, OK

Merger and Acquisition Manager

Special Projects Manager

Small Business Development Manager

Obtained a wide variety of business experience including feasibility studies, business valuations, forecasts, projections, tax planning, SBA loans and workouts, internal control design and accounting software installations while working with clients such as Continental Illinois National Bank and Trust Co. of Chicago, Chase Manhattan Bank, Michigan National Bank, FDIC, Resolution Trust Company and numerous small – medium sized business clients.

1982, January to 1985, April – IT&T, New York, NY

Cash Management supervisor, Oil and Gas

Revenue Supervisor, Crescent Pipe and Supply Accounting Manager

Managed company cash via IT&T Cash Management Maximization Plan, oversaw oil and gas revenue department for approximately 5,000 oil and gas properties and managed accounting for retail/wholesale oilfield parts and pipe company.

EDUCATION: B.S. Accounting – Oklahoma Christian College, Edmond, OK – 1981

PERSONAL CERTIFICATIONS: CPA - 1985

CAROL WYATT

635 S. 282nd E. Ave
Catoosa, OK 74015
(918) 266-9945

EXPERIENCE:

1/21/02 to Present **Cherokee Nation Enterprises**
Barbara Knowlton, Corporate Administrative Manager

Office Administrator – Support Executive offices. Set up and maintain filing system for CEO. Greet guests for executives, Marketing and I.T. Departments. Coordinate meetings/conference rooms. Order supplies. Take and type notes from meetings. Make travel arrangements. Make deposits for all non-gaming money. Manage the Wind Energy Grant which Cherokee Nation was awarded \$166,179 by U.S. Department of Energy. Manage the MAP grant which was awarded \$101,780 by the U.S. Department of Interior. (See Wind Energy Grant attachment due duties on wind energy projects).

Cherokee Nation Enterprises

Taylor Keen, Vice President-Business Development & Support Services 384-7880

Executive Administrative Assistant, supporting Business Development and other Executives. Greet guests, answer phones. Coordinate meetings/conference rooms. Liaison for security, cleaning services, phone services. Inventory and order supplies and furniture for offices. Research for grant opportunities. Enter all data for Guardtronics security systems for proximity access and alarm codes.

Cherokee Nation Industries

Timothy Kennedy, Director-Environmental & Construction

Program Assistant - supported Director and Project Managers on environmental and construction projects. Involved in planning and development of programs, representative to meetings, submitted grant proposal to U.S. DOE for feasibility study for wind energy for Cherokee Nation, assisted in coordinating projects, grant research, took minutes at meetings, and other miscellaneous duties.

**8/01/00 to
12/31/01**

Conoco, Inc., 1000 S. Pine, Ponca City, OK

Gary Allred, Director-Operations & Planning-Refinery, 767-3001

Administrative Support - supported 100 salaried refinery personnel and input monthly into HR System, Telephone, move and computer coordinator; verified and signed all Travel Expense Reports; placed food orders for area meetings and turnarounds; processed invoices and procurement card receipts; prepared and submitted overtime sheets for coordinators; notified area supervisors of random drug selections for medical; validated and updated revisions annually of approximately 1,000 plant procedures.

**12/01/99 to
7/28/00**

Boettcher, Ryan & Martin - 116 N. Fifth St., Ponca City, OK 765-9967

Kenneth N. Jean, Attorney at Law

Legal Secretary - responsible for screening incoming calls to the attorney, which required interacting with the clients, and handling the situation from information on the Data Manager, if possible. Processed medpay requests to insurance and paid medical bills when received. Typed checks on trust account and operating account for settlements and medpay claims. Assisted clients who came to the office.

**1994 to
11/30/00**

Kaw Nation - Drawer 50, Kaw City, OK 74641, (580) 269-2552

Melanie Knight, Grants/Contracts Director

Administrative Clerk - Responsible for maintaining files for all grants and contracts and meeting reporting requirements on 46 active grants. Served as coordinator for collecting data, word processing, editing, and assembling more than 143 grants applied for in the past five (5) years which generated over \$13.6 million in program funding. Successfully wrote three grants which were funded. Developed tracking process and forms for grants submitted, funded, and reporting requirements.

Developed procedures manual for Grants/Contracts Department. Conducted research for federal, state, and foundation funding from various resources. Served as Library Grant Coordinator-- ordered all publications, newspapers, books and software charged to the Library grant. Developed annual proposal and submitted all required reports. Assisted in meetings for Grants and Contracts and other departments by taking notes using a laptop or shorthand.

- 1992 - 1994** - **Aileen, Inc.**, 4875 White Avenue South, Blackwell
Sherry Rogers, Manager
Part-time position for ladies clothing store. Responsible for sales, customer relations, cashier, and third-key holder (opening/closing bookkeeping, including deposits, and entering sales data into mainframe), conducted monthly inventory.
- 1991 - 1992** - **Conoco, Inc.** - P.O. 1267, Ponca City, OK 74602
Secretarial positions using word perfect and data entry. Also worked in Retail Credit, and Employee Benefits Departments.
- 1986 - 1991** - **Cherokee Nation**- P.O. Box 948, Tahlequah, OK
Cherokee Nation Tribal Election
Office Manager supervising 25 employees. Processed voter registrations for 75,000 Cherokees, absentee ballots, received and posted candidate filing fees, maintained office files. Assured compliance with election ordinances. This was the first year for districts and required voter registration.
- Registration Dept.- Certification Clerk.** Processed documentation to verify Indian ancestry and obtain CDIB, research, telephone inquiries.
- Secretary to Election Committee** - Transcribed notes of all meetings for the election, helped in organizing the election, typed correspondence.
- 1981 - 1986** - **Rockwell International** - P.O. Box 51308, Tulsa, OK
Cliff Sickles, Purchasing Manager
Secretary to Purchasing Manager: 68 employees and 6 supervisors. Heavy typing, scheduled meetings and travel plans, prepared briefings for presentations to management, scheduled all vacations, maintained departmental personnel records, assisted with development of salary plans. Also assisted buyers with typing and completion of case file memos.

Wind Energy Grant Activities Performed by Carol Wyatt

Overview

Daily:

- Access system by modem and retrieve data from SoDAR from previous day.
- Retrieve information on SoDAR unit and send to Scott Williamson to analyze system.
- Prepare wind grid charts as needed for daily wind information
- Update Wind Energy Activity Journal

Monthly:

- Compile data into reports: Monthly chart, wind rose, and grid chart

Quarterly:

- Prepare spreadsheet for drawdown from U.S. DOE
 - Contact Accounts Payable & request all telephone charges & other invoices
 - Prepare spreadsheet to CEO for signature
 - Send spreadsheet & receipts to Cherokee Nation Accounting for drawdown from DOE
- Prepare and send quarterly report by electronic upload to U.S. Dept. of Energy

- Financial report
- In-Kind Report
- Update of activities and timelines
- Attach quarterly charts and wind rose charts

Annually:

- Prepare presentation for DOE Tribal Program Review
- Attend Tribal Program Review (required)

Other Responsibilities:

- Coordination and completion of all wind energy projects
- Set deadlines, assign responsibilities; monitor and summarize progress of project
- Liaison for all activities with: vendors, Cherokee Nation, CN OES Dept. CN Accounting, Chilocco property Lessee, electrician, Chamco, SBC, AeroVironment/Atmospheric Systems (Dr. Ken Underwood), CNE: Accounts Payable, Buyers, I.T. Techs, CNB Business Development, Kaw Nation Utility Commissioner, U.S. DOE (U.S. Dept. of Energy), NREL (National Renewable Energy Lab)
- Make travel and meeting arrangements
- Attend meetings
- Coordinate events
- Keep track of all expenses; balance budget
- Correspondence and filing
- Purchase and order supplies
- Report activities to CEO regarding status of project
- Make sure SoDAR is working properly.
- Troubleshoot problems and coordinate activities to solve them
- Prepare all requisitions for payment
- Prepare articles for public information
- Research for additional funding for wind energy project
- Prepare analysis and business plan for final report
- Research for funding for implementation stage of project
- Collect electric bills from all Cherokee Nation Enterprises, Cherokee Nation and Cherokee Nation Industries facilities and prepare spreadsheets for business plan and future planning
- Work with Wind Energy Consultant for CNE wind energy development

Accomplishments:

- Prepared and submitted U.S. Dept. of Energy grant proposal, which was awarded \$166,179.
- Prepared SoDAR equipment site for set-up
- Scheduled and attended two 3-day training sessions on monitoring and maintenance of SoDAR
- Wrote and submitted grant to U.S. Dept. of Interior, Minerals and Assessment Program, and received a grant award of \$101,780

Meetings Attended:

- | | |
|---------|---|
| 3-13-02 | Oklahoma Renewable Energy Council meeting, Tulsa University |
| 3-20-02 | Pre-app conference March 20, 2002, Denver CO |
| 3-25-02 | DOE Proposal Writing Workshop, Denver, CO |
| 3-25-02 | Meeting at Cherokee Nation – for approval to apply for the grant. |
| 4-09-02 | Oklahoma Inter-Tribal Energy Project Meeting - Tulsa University |
| 4-11-02 | 2002 Wind Power and Bioenergy Conference, Oklahoma City |
| 7-19-03 | 2003 Oklahoma Wind Power & Bioenergy Conference, Norman OK |

9-30-03	Planning & Infrastructure Meeting, Cherokee Nation. Presented wind project
10-26-03	WEATS (Wind Energy Applications Training Symposium) (Oct 26-31), Boulder CO
11-17-03	U.S. DOE Tribal Program Review, Denver CO (Nov. 17-20) – Gave presentation
4-09-04	Open house & tour of Woodward Wind Farm sponsored by OG&E & FPL
5-05-04	SoDAR Training with Dr. Underwood, CN & CNE (May 5-7)
7-21-04	Meeting with OES (Office of Environmental Services) from Cherokee Nation
10-18-04	U.S. DOE Tribal Program Review (Oct 18-21), Golden CO
7-25-05	SoDAR maintenance & training (Catoosa & Chilocco site) (July 26-28)
9-27-05	Emerging Technology Conference, Norman, OK – Gave presentation on our wind project
10-17-05	U.S. Department of Energy, Tribal Program Review (Oct. 17-21)

JOSEPH BRIGNOLO

P. O. Box 506
 Lebanon, Ohio 45036
brignolo@soncov.com
 513-899-9152

2004 – Present

- Wind Energy Project Development Consultant for Cherokee Nation Enterprises, a wholly owned company of the Cherokee Nation in Catoosa, Oklahoma.
 - Detailed wind resource assessment and evaluation working with Certified Meteorologist to verify commercial, utility scale wind data;
 - Commercial, utility scale wind project location;
 - Wind Turbine power curve evaluation and turbine selection, purchase negotiation, and integration;
 - Transmission study, power purchase and interconnect agreement negotiation;
 - Identification of distributed loads, review of several opportunities for distributed generation, and site and location selection to satisfy those loads;
 - Green Tag market research, positioning, and analysis.
- Business Plan research, development, and creation for small to middle size companies in the private and government sectors.
- Market evaluations and new product integration for small to medium size companies in the private sector.
- Renewable energy project development for investment firms in the area of project feasibility.
- Consultant to various wind projects throughout the United States and the Caribbean.

Vice President of Operations and Program Development, Foundation for the American Indian 2000-2004

While working with The Foundation for the American Indian I functioned in Native America in various capacities. These capacities include:

- Contract and business negotiations between corporate America and Native American entities.
- Integrating tribal renewable energy development projects with real-world solutions.

- Helping tribes develop programs which build tribal capacity and community sustainability.
- Private, public, and corporate fundraising for The Foundation for the American Indian, as well as Tribes and other Native American Organizations.
- Proposal development, writing, and implementation for Native American entities in the areas of renewable energy, education and training, health, and manufacturing.
- Project Manager for the design, building, installation and commissioning of 2 utility scale wind turbine projects at several Native American Reservations.
- Complete renewable energy project integration with utilities, contractors, turbine suppliers, FAA, and funders.
- Successfully negotiated Power Purchase and Interconnect Agreements on behalf of Turtle Mountain Community College with Ottertail Power for a 660 kilowatt wind turbine. (Details available upon request.)
- Creating retail Green Tag markets for these wind projects which will produce more than 4,000,000 kilowatt hours annually and provide a savings of more than \$300,000 per year for two Tribes.
- Develop and implementing programs to explore the wind power potential (wind resource assessment) at Tribal Colleges and Universities as well as Tribal Nations in conjunction with the Department of Energy.
- Charter Member of the Department of Energy's Tribal Energy Program.
- Familiar with the various types of renewable energy, and have acquired the expertise to develop and implement Renewable Energy solutions in Native America.
- Instrumental in developing an Education and Training Program on the Fort Peck Reservation which will find, train, and certify employees for Assiniboine and Sioux Tribal Industries, one of the largest Native American Defense contractors in the U. S.

Consultant, Photographer, 1996 – 2000

- Worked with National Real Estate firms (Coldwell Banker, Weichert Realtors) to design, create, produce, and implement interactive, web deliverable marketing tools. These interactive Multi-Media Modules integrated on-line listing (electronic land records) services with real time customer input to quickly and efficiently identify the potential buyer/seller(s) needs and parameters.
- Marketing Consultant to the largest scissor manufacturer (ACME United) in the United States. Responsible market research and for redesigning the entire scissor line to meet efficient manufacturing criteria in China, while complying with U.S. Patent rights. Responsible for all corporate product and advertising photography, marketing materials, and marketing incentive programs.
- Created, designed, produced and staged National Sales and Marketing Meetings for a major beauty company (Clairol) to elevate their hair care products to "Salon" status.
- Consultant to various manufacturing firms to increase market share, internal productivity and profit.
- Conducted marketing study for, and created / produced national television advertising campaign for Long John Silver's new product the "Wrap," as well as several other products.
- Strategize with Major Corporations to increase marketing and product line extension/awareness as well as business strategies as it relates to gaining market share on the Internet.
- Created marketing programs and material for Loan Pricing Corporation (a division of Reuters International) as it relates to new business development and product line expansion.

Focal Group Incorporated, 1983-1996

Owner, President, and Creative Director of Focal Group, a multi-million dollar, nationally acclaimed Marketing Communications / Multi-Media Company. Focal Group employed 21 individuals in Westport, Connecticut with remarkable degrees of talent and expertise. Our clients included:

- **General Foods, Kraft Foods** – Jell-O: No-Bake Desserts, Jell-O Pudding Snacks (Product Introduction and Product manufacturing consultation), Bakers product line, Jell-O Gelatin, Maxwell House (Trade Shows), Kool-Aid (Product line extensions), Minute Rice. These brands relied on Focal Group for all Marketing and Sales functions including: Market Share research and analysis for Brands as well as individual products; Market research and development for product line extensions; Sales incentive programs; and nationwide product introductions and rollouts.
- **General Electric** – Positioning to sell GE Small Appliances to Black and Decker. All GE Lighting, Major Appliance, Turbine and Jet Engine national sales and marketing shows meetings and sales material. Worked with Jack Welch
- **M&M Mars** – 1984 Olympic Sponsor Module and Olympic based marketing programs including sales incentive programs for the trade.
- **General Electric Credit Corporation (GE Capital)** – All Graphic Support. The Photography for three Annual Reports, 5 National Sales Meetings, and 5 Analyst Meetings
- **Citi Corp** – All collateral material for the Security Custody Division. The development of active cash management programs, sales and marketing incentive programs as well as sales training programs.
- **Citi Bank** – Developed credit card vendor programs, and created, produced, and staged National Sales Meetings.
- **Pepsi** – Created, designed, produced, and staged the Slice new product introduction at Lincoln Center. Worked with the design department to develop can and package graphics and design.
- **First Brands** – Glad, STP, Forest Tech (Starter, Hearth Logg), Himolene, and Scoop-Away: Created, designed, and produced all of First Brands national sales and marketing meetings until they were sold to Clorox in 1998. Also photographed and designed many FSI's across their various product lines.
- **Duracell** – Batteries-Designed and Created the graphic icon for the "KRAM" cell introduction. This graphic was used on all packaging, point of sale and television advertising. Lighting-Created FSI, POS and marketing material to support the Duralight product line extensions.
- **Cadbury Schweppes** – Roses Lime Juice, Mr. & Mrs. T's Drink Mixes, Motts Snack Pack. Responsible for all collateral material, FSI's, and Sales Meetings. Also consulted on the troubled Manufacturing Process of Mott's Snack Pack to ensure superior quality and consistency
- **Brunswick Bowling** – Introduce and tour the AMF "Color-Vision" scoring system through out the U.S.
- **Pilot Pen** – Explorer Pen product introduction including all photography, sales and marketing materials and promotion.
- **Richardson-Vicks** – Pantene, Ban de Solve, Krizia, Created, designed, produced and staged all their National Sales and Marketing meetings, as well as all the Beauty Division's new product introductions.

Freelance Multi-Media Producer, 1980-1984

Created, wrote, designed, photographed, choreographed, programmed, and staged 9-120 projector, 3-60 screen Multi-Media shows. These Multi-Media experiences were a combination of lighting special effects, music, dancing, live actors, video projection, slide projection, and laser effects. Clients include:

- **Dewar's Scotch** – A 9 projector single screen 3-day seminar “The Proud Professional's” Gale Sayers, Spokesperson. The introduction of an innovated sales and marketing training technique that increased sales by more than 55% in the first 6 months.
- **Karistan Carpets** – “America the Beautiful” a “scrapbook” of our country and how Karistan Carpets is beautifying America. 18 projector 3 screen show that toured the continental United States for 1 year. Tied to this program was a complex marketing incentive program I developed which increased the distribution of Karistan Carpets by 62% in 1982. Karistan increased their share by 22% as a result.
- **General Electric** – “GE Giant Coupon” A trade introduction to an innovative way to attract multi-level new consumer base to the Major Appliance industry
- **Australia** – 180 projector 60 screen exhibition at the 1982 Knoxville World's Fair
- **EURPAC** – Multi-Media event portraying the advantages of having EURPAC installations on military bases throughout the world.
- **Chase Manhattan Bank** – The introduction of “Info Cash” in Asia and Europe. Info Cash was the predecessor of Electronic Funds Transfer.
- **Maxwell House Coffee** – Introduced the Sanka “Increased Cup Yield” (ICY) product line.

KEW Photo Labs – Manager, Night Shift, 1978-1980

In the process of recovering from my hip replacement, I chose to put my vast photographic experience to work under “less strenuous” conditions. From 6pm-6am 6 nights a week, my responsibilities were to:

- Operate and maintain the C-41 film processing equipment as well as the consumer based photo printer.
- Develop all black and white negatives.
- Complete all black and white photographic printing.
- Complete all color negative developing.
- Complete all commercial color printing.
- Monitor, operate and maintain the Collenta E-6 processor and mount all color film for morning delivery
- Operate and maintain the photo-computer type setter, completing all jobs due in the following morning
- Shoot and process all studio photography due in the morning.
- Shoot, process, and mount all animation photography jobs. (Forox Animation Stand)
- Originate and complete all paperwork regarding above duties and generate invoicing for same.

JB Brignolo Jr. Inc. – Photographer, President, 1974-1978

Owned and operated a 4000 square foot photographic studio in Stamford, Connecticut. My position as Chief Photographer and President provided me with the opportunity to develop managerial skills while presiding over a staff of six. JB Brignolo Jr. Inc. gained national recognition by producing award winning Photographic Design for clients such as: Clairol, Canadair Jets, Pepsi, American Can, Continental Can, GTE, General Electric, Xerox, Combustion Engineering, Booz Allen & Hamilton, Act Media, Perkin Elmer, Walden Books, and Continental Oil Company.

Photographer – Public Relations and Development Office, University of Bridgeport, 1972-1974

Developed, coordinated, produced and photographed all media events at the University. I was responsible for photographing, developing, and printing of all pictures used for print media. Coordinated external media such as: news papers, radio, and television stations with respect to all University events. I traveled with the University’s NCAA Division III teams photographing important and championship games, as well as coordinate local, regional and national external media. I reported directly to the Vice President of Development and Public Relations to help position the University within the Community, State and the Nation. This position enabled me to enhance and improve our University’s academic standards.

Education: 1974 Bachelors Degree in Electrical Engineering and Business/Finance, with a minor in Electronic and Performing Arts (Multi-Media).

Scott Williamson

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Cell: 918-521-3104

OBJECTIVE: To use my knowledge and skills to benefit my tribe and the community at large, either directly or indirectly by working in a responsible and worthwhile position.

EXPERIENCE Support Services
Information Systems Department
December 2001 Cherokee Nation Enterprises, Catoosa OK
to Present Technical Support Analyst

Performed various roles due to being part of an initially small IS staff, including but not limited to being one of three techs providing phone support as well as field support for casinos, admin offices and retail locations, and whose scope of responsibility started with the user’s desktop and ended with the patch at the switch. The scope of user education ranged from one-on-one to leading orientation workshops and in applications training. Provided limited support for system-wide applications, when required. On occasion, provided limited assistance with network maintenance. This is an environment that includes Windows 2000 and 98 desktops, Windows 2000 and NT servers, Dell and clone desktops; and a Dell and Cisco network infrastructure.

Also, provided support and coordination for the IT aspects of a survey/feasibility project for the development of wind energy, including using/maintaining remote sensor equipment and collecting, analyzing, preparing data for internal and external reporting.

June 1999 to Department of Computing and Telecommunications
November 2000 Northeastern State University, Tahlequah OK
Programmer/Analyst

Performed systems and application design and development as well as maintenance programming in COBOL. The architecture for NSU’s systems is client-server running on terminal sessions on a HP mini-computer. The environment was non-object COBOL running on HP IMAGE 3000 databases. Systems that I primarily was responsible for

were student loan management and enrollment.

September 1998
to May 1999

Office of Administration and Financial Management
Health Services Division
Cherokee Nation, Tahlequah OK
Data Entry Technician (Accounts Payable)

Handled various aspects of the account payable process for Health Department (which included 6 clinic sites, an EMS unit, Behavioral Health and Public Health offices, and various programs). This included filling out check requests/purchase requisitions to checking accuracy of program/clinic paperwork, filling various information requests, following up with the programs/clinic and with vendors as well as other departments, etc. Also performed various other tasks not normally associated with a payables clerk, which included anything from providing desktop support to tearing down and rebuilding modular offices. **Received merit bonus award for saving \$10,000 in labor costs for cubicle remodeling project.

June 1995 to May
1998

John Vaughn Library, Northeastern State University, Tahlequah OK
Student Assistant, Periodicals Desk

Assisted patrons in the search for and the use of materials, and in the use of library equipment (microfilm reader/printers, copies, etc), also made change and sold copier cards

June to August
1997

Trail of Tears Drama: "Nation",
Cherokee National Historical Society, Tahlequah OK
Assistant Electrician, Lighting Tech/Board Operator

Assisted theater electrician in rebuilding and upgrading existing lighting system, including rebuilding appliances and installing a digital control system. During production, operated the control board to through programmed lighting changes and maintained lighting system.

EDUCATION

BBA in Management of Information Science from Northeastern State University NSU), Tahlequah Oklahoma, in December 1999.

ACTIVITIES

Current member of the Rogers County Cherokee Association

Native American Student Association, NSU

- Treasurer, 1 yr.
- Scholarship Committee Chair, 3 yrs.
- Constitutional Review Committee Chair, 1 yr.

American Indian Student Association, University of Oklahoma (OU)

American Indian Science and Engineering Society, OU

Representative, Housing Council Association, OU

Volunteer (Security) Escort, HCA Escort Service, OU

Worked as a co-systems operator on a private non-profit electronic bulletin board system

SPECIAL SKILLS

Computers: operating (various application types), systems / application design, programming, troubleshooting and repair of hardware and software

Other: working with the public, including training; general business skills, including accounting/bookkeeping

OTHER
INFORMATION

Member of American Mensa, Ltd.

Can furnish BIA Indian Preference Form 5-4432 or equivalent, if necessary.

APPENDIX

Oklahoma Wind Energy Development

Oklahoma Wind Energy Development					
Existing Project or Area	Owner	Date Online	MW	Power Purchaser/ User	Turbine / Units
Woodward	Oklahoma Muni Power Authority	2003	51.0	Oklahoma Muni Power Authority	GE Wind 1.5 MW (34)
Woodward	FPL Energy	2003	51.0	Oklahoma Gas & Electric	GE Wind 1.5 MW (34)
Blue Canyon Wind Power (North of Lawton)	Zilkha Renewable & Kirmart Corp.	2003	74.25	Western Farmer's Elec Co-op	NEG Micon 1.65 MW (45)
Weatherford Wind Energy Center	FPL Energy	2005	106.5	Public Service Co. of Oklahoma	GE Wind 1.5 MW (71)
Weatherford Wind Energy Center Expansion	FPL Energy	2005	40.5	Public Service Co. of Oklahoma	GE Energy 1.5 MW (27)
Bergey Windpower Headquarters	Bergey Windpower	2005	0.05	Bergey Windpower Headquarters	Bergey Windpower 50 kW (1)
Blue Canyon II	Horizon Wind Energy	2005	151.2	Public Service Co. of Oklahoma	Vestas 1.8 MW (84)

Proposed Wind Projects in Oklahoma

Project	Utility/Developer	Location	Status	MW Capacity	On Line By / Turbines
Invenergy	OG&E/Invenergy	Harper County	Proposed	120	

Sources:

*Installed & Projected MW - AWEA

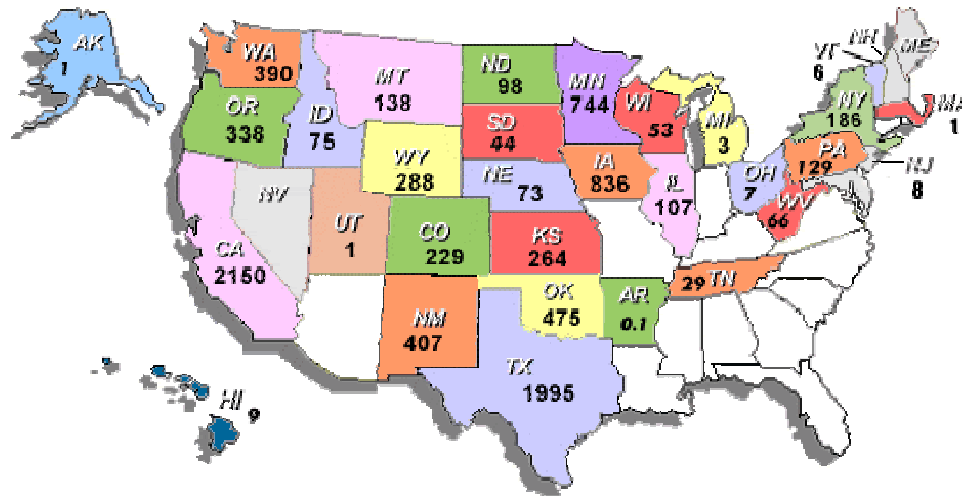
**Wind Energy Potential - *An Assessment of the Available Windy Land Area and Wind Energy Potential in the Contiguous United States, Pacific Northwest Laboratory, 1991.* ("Potential" is stated in terms of average Megawatts of Capacity (MWa), or megawatts of capacity at 100% capacity factor. 1 MWa is roughly equal to about 3 MW of nameplate wind turbine capacity.)

Installed Wind Projects in the United States

Wind Energy Projects throughout the United States of America

Click on the shaded states to access information on existing and planned wind energy projects. Installed MW for each state in black.

Updated: 18 January 2006



TOTAL INSTALLED U.S. WIND ENERGY CAPACITY: 9,149 MW as of Dec 31, 2005

Graphic: [U.S. Installed Capacity, 1981 - 2005](#)

Western Farmers Electric Co-operative

In existence for over 60 years, Western Farmers Electric Co-operative (WFEC) has grown into Oklahoma's largest locally owned power supply system. WFEC is a generation and transmission co-operative that provides essential electric service to 19 member-owner co-operatives, an air force base and other power users.

With three generation plants located at Mooreland, Anadarko and Hugo, WFEC has total power capacity of more than 1,400,000 kilowatts when the purchased hydropower is included.

Supplying the electrical needs of more than two-thirds of rural Oklahoma, WFEC is still committed to its original purpose, which is to supply its member-owners with electric power at the lowest possible cost, consistent with adequate and reliable service, efficient operation and financial stability.

WFEC Quick Facts:

Gas-fired	724 Megawatts (Summer)
	789 Megawatts (Winter)
Coal-fired	450 Megawatts
Hydro	279 Megawatts
Wind	74 Megawatts
Miles of transmission line	3,700

U.S. Energy Supply and Demand: Base Case

<http://www.eia.doe.gov/emeu/steo/pub/h1tab.html>

(Energy Information Administration\Short-Term Energy Outlook – February 2006)

	Year				Annual Percentage Change		
	2004	2005	2006	2007	2004-2005	2005-2006	2006-2007
Real Gross Domestic Product (GDP) (billion chained 2000 dollars)	10756	11146	<i>11528</i>	<i>11845</i>	3.6	3.4	2.7
Imported Crude Oil Price ^a (nominal dollars per barrel)	35.99	49.18	<i>57.99</i>	<i>53.60</i>	36.7	17.9	-7.6
Crude Oil Production ^b (million barrels per day)	5.42	5.10	<i>5.34</i>	<i>5.63</i>	-5.9	4.6	5.5
Total Petroleum Net Imports (million barrels per day) (including SPR)	12.10	12.37	<i>12.32</i>	<i>12.44</i>	2.3	-0.4	1.0
Energy Demand							
World Petroleum (million barrels per day)	82.5	83.7	<i>85.3</i>	<i>87.2</i>	1.5	1.9	2.2
Petroleum (million barrels per day)	20.73	20.67	<i>21.02</i>	<i>21.48</i>	-0.3	1.7	2.2
Natural Gas (trillion cubic feet)	22.47	22.15	<i>22.10</i>	<i>22.61</i>	-1.4	-0.2	2.3
Coal ^c (million short tons)	1107	1135	<i>1149</i>	<i>1164</i>	2.5	1.3	1.3
Electricity (billion kilowatt hours)							
Retail Sales ^d	3548	3661	3677	3748	3.2	0.4	1.9
Other Use/Sales ^e	179	170	<i>175</i>	<i>181</i>	-4.9	2.7	3.7
Total	3727	3831	<i>3852</i>	<i>3930</i>	2.8	0.5	2.0
Total Energy Demand ^f (quadrillion Btu)	98.2	98.5	<i>99.2</i>	<i>101.1</i>	0.4	0.7	2.0
Total Energy Demand per Dollar of GDP (thousand Btu per 2000 Dollar)	9.13	8.84	<i>8.60</i>	<i>8.54</i>	-3.1	-2.7	-0.8
Renewable Energy as Percent of Total ^g	6.4%	6.4%	6.3%	6.4%			

^a Refers to the refiner acquisition cost (RAC) of imported crude oil.

^b Includes lease condensate.

^c Total Demand includes estimated Independent Power Producer (IPP) coal consumption.

^d Total of retail electricity sales by electric utilities and power marketers. Utility sales for historical periods are reported in Energy Information Administration (EIA) *Electric Power Monthly* and *Electric Power Annual*. Power marketers' sales for historical periods are reported in EIA's *Electric Sales and Revenue*, Appendix C. Data for 2004 are estimates.

^e Defined as the sum of facility use of onsite net electricity generation plus direct sales of power by industrial- or commercial-sector generators to third parties, reported annually in Table 7.5 of the *Monthly Energy Review (MER)*. Data for 2004 are estimates.

^f The conversion from physical units to Btu is calculated by using a subset of conversion factors used in the calculations performed for gross energy consumption in EIA's *MER*. Consequently, the historical data may not precisely match those published in the *MER* or the *Annual Energy Review (AER)*.

^g Renewable energy includes minor components of non-marketed renewable energy, which is renewable energy that is neither bought nor sold, either directly or indirectly, as inputs to marketed energy. EIA does not estimate or project total consumption of non-marketed renewable energy.

SPR: Strategic Petroleum Reserve.

Notes: Minor discrepancies with other published EIA historical data are due to independent rounding. Historical data are printed in bold; estimates and forecasts are in italics. The forecasts were generated by simulation of the Short-Term Integrated Forecasting System.

Sources: Historical data: Latest data available from Bureau of Economic Analysis and Energy Information Administration; latest data available from EIA databases supporting the following reports: *Petroleum Supply Monthly*, DOE/EIA-0109; *Petroleum Supply Annual*, DOE/EIA-0340/2; *Natural Gas Monthly*, DOE/EIA-0130; *Electric Power Monthly*, DOE/EIA-0226; and *Quarterly Coal Report*, DOE/EIA-0121; *International Petroleum Monthly*, DOE/EIA-0520; *Weekly Petroleum Status Report*, DOE/EIA-0208. Macroeconomic projections are based on Global Insight Model of the U.S. Economy, January 2006.

US Per Capita Electricity Use By State in 2001

http://www.energy.ca.gov/electricity/us_percapita_electricity.html

US Per Capita Electricity Use By State in 2001					
State Rank	State Name	State Abbreviation	kWh (million)	Estimated Population	Per Capita Electricity Use (kWh)
1	Wyoming	WY	12,950	494,118	26,208
2	Kentucky	KY	79,975	4,067,781	19,661
3	South Carolina	SC	74,832	4,061,209	18,426
4	Alabama	AL	79,234	4,468,031	17,734
5	Louisiana	LA	74,681	4,466,532	16,720
6	Tennessee	TN	95,320	5,748,038	16,583
	District of Columbia	DC	9,410	569,408	16,526
7	Idaho	ID	21,096	1,321,228	15,967
8	Indiana	IN	97,734	6,127,732	15,949
9	Arkansas	AR	41,732	2,692,134	15,501
10	Mississippi	MS	44,287	2,858,325	15,494
11	North Dakota	ND	9,810	636,326	15,417
12	West Virginia	WV	27,669	1,801,824	15,356
13	Texas	TX	316,062	21,334,855	14,814
14	Nebraska	NE	24,723	1,718,840	14,384
15	North Carolina	NC	117,623	8,198,256	14,347
16	Oklahoma	OK	49,667	3,466,533	14,328
17	Georgia	GA	117,790	8,391,282	14,037
18	Ohio	OH	154,459	11,387,860	13,563
19	Nevada	NV	28,167	2,095,235	13,443
20	Delaware	DE	10,665	795,633	13,404
21	Virginia	VA	96,123	7,104,852	13,377
22	Iowa	IA	39,213	2,931,593	13,376
23	Washington	WA	79,666	5,992,767	13,294
24	Kansas	KS	35,847	2,701,233	13,271
25	Oregon	OR	45,885	3,474,161	13,208
26	Missouri	MO	73,213	5,642,575	12,975
-	U.S. Average				12,811
27	Montana	MT	11,165	906,241	12,320

28	Florida	FL	199,698	16,353,565	12,211
29	Minnesota	MN	60,288	4,985,666	12,092
30	Wisconsin	WI	65,184	5,405,905	12,058
31	Arizona	AZ	62,282	5,296,845	11,758
32	South Dakota	SD	8,627	758,217	11,378
33	Pennsylvania	PA	137,894	12,298,487	11,212
34	Maryland	MD	59,800	5,379,450	11,116
35	Illinois	IL	135,685	12,518,441	10,839
36	New Mexico	NM	18,727	1,821,544	10,220
37	Michigan	MI	101,955	10,004,710	10,191
38	Utah	UT	23,217	2,281,161	10,178
39	Colorado	CO	44,236	4,427,288	9,992
40	Maine	ME	11,836	1,286,633	9,199
41	Vermont	VT	5,617	612,964	9,164
42	Connecticut	CT	30,531	3,433,243	8,893
43	Alaska	AK	5,428	632,389	8,583
44	New Jersey	NJ	72,340	8,506,267	8,504
45	Massachusetts	MA	52,663	6,395,414	8,234
46	New Hampshire	NH	10,316	1,259,183	8,193
47	Hawaii	HI	9,776	1,222,011	8,000
48	Rhode Island	RI	7,847	1,058,604	7,413
49	New York	NY	141,399	19,085,862	7,409
50	CALIFORNIA	CA	235,439	34,532,163	6,818
Sources:					
Population - http://www.census.gov/popest/states/tables/NST-EST2004-01.pdf					
Kilowatt-hours - http://www.eia.doe.gov/emeu/states/sep_fuel/html/fuel_es.html					

Link to Fuel Expenditure by Type and State

http://www.eia.doe.gov/emeu/states/sep_fuel/html/fuel_es.html

Oklahoma Electricity Consumption - 2003

2003	Residential	Commercial	Industrial	Transportation	Total
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	Million Kilowatt Hours				
Oklahoma	20,162	16,958	13,308	0	50,428

Top 20 States for Wind Energy Potential

THE TOP TWENTY STATES for wind energy potential, as measured by annual energy potential in the billions of kWh, factoring in environmental and land use exclusions for wind class of 3 and higher.

1 North Dakota 1,210	11 Colorado 481
2 Texas 1,190	12 New Mexico 435
3 Kansas 1,070	13 Idaho 73
4 South Dakota 1,030	14 Michigan 65
5 Montana 1,020	15 New York 62
6 Nebraska 868	16 Illinois 61
7 Wyoming 747	17 California 59
8 Oklahoma 725	18 Wisconsin 58
9 Minnesota 657	19 Maine 56
10 Iowa 551	20 Missouri 52

Source: *An Assessment of the Available Windy Land Area and Wind Energy Potential in the Contiguous United States*, Pacific Northwest Laboratory, 1991.

http://www.awea.org/pubs/factsheets/Wind_Energy_An_Untapped_Resource.pdf



The Renewables Portfolio Standard: How It Works and Why It's Needed

What is the Renewables Portfolio Standard?

The Renewables Portfolio Standard (RPS) is a flexible, market-driven policy that can ensure that the public benefits of wind, solar, biomass, and geothermal energy continue to be recognized as electricity markets become more competitive. The policy ensures that a minimum amount of renewable energy is included in the portfolio of electricity resources serving a state or country, and by increasing the required amount over time the RPS can put the electricity industry on a path toward increasing sustainability. Because it is a market standard, the RPS relies almost entirely on the private market for its implementation. Market implementation will result in competition, efficiency and innovation that will deliver renewable energy at the lowest possible cost.

How Would the RPS Work?

Renewable Energy Credits are central to the RPS. A Credit is a tradable certificate of proof that one kWh of electricity has been generated by a renewable generator. Credits are denominated in kilowatt-hours (kWh) and are a separate commodity from the power itself. The RPS requires all electricity generators (or electricity retailers, depending on policy design) to demonstrate, through ownership of Credits, that they have supported an amount of renewable energy generation equivalent to some percentage of their total annual kWh sales. For example, if the RPS is set at 5%, and a generator sells 100,000 kWh in a given year, the generator would need to possess 5,000 Credits at the end of that year.

Investors and generators make all decisions about how to comply, choosing the type of renewable energy to acquire, which technologies to use, what renewable developers to do business with, what price to pay, and which contract terms to agree to. Companies decide for themselves whether to invest in renewable energy projects and generate their own Credits, enter into long-term contracts to purchase Credits or renewable power along with Credits, or simply to purchase Credits on the spot market. Only the bottom line is enforced: possession of a sufficient number of Credits at the end of each year. The Credit system provides compliance flexibility and avoids the need to "track electrons." Because the RPS applies equally to all generators, it is competitively neutral.

What Is The Government's Role Under the RPS?

Government involvement would be limited to certifying Credits, monitoring compliance, and imposing penalties if necessary. The Credit certification process would apply to renewable producers who wish to certify their renewables output. Monitoring compliance would require each generator to demonstrate ownership of a sufficient number of Credits relative to electricity sales. For generators that are not in full compliance with the RPS at the end of the year, the administrative agency would assess an automatic penalty for each Credit that the generator fails to produce as required.

The amount of the penalty should be several times what it would have cost to purchase the Credits. A high penalty level makes the policy self-enforcing by avoiding the need to resort to costly administrative and enforcement measures. It is modeled after the federal sulfur dioxide (SO₂) allowance trading program, under which an automatic \$2,000/ton penalty is imposed for each excess ton of SO₂ produced. Because of the high penalty associated with noncompliance, the EPA has not had to take any enforcement actions -- it is far more economic for power plants to comply than not.

What Are the Efficiency Advantages of the RPS Approach?

An advantage of the RPS over direct subsidy approaches is that it avoids the process of government agencies distributing funds, which can be bureaucratic and inefficient. In addition, government-administered programs almost always impose artificial constraints of various types, which increase costs.

Second, under the RPS, no renewable energy project is guaranteed a place in the market. Unlike a one-time competition for funds, each project must continually compete to keep its place in the market created by the standard. For example, existing projects and technologies must compete with new ones, and project enhancements must compete with Greenfield projects.

Third, the certainty and stability of the renewables market created by a properly-designed RPS will enable long-term contracts and financing for the renewable power industry, which will, in turn, lower renewable power costs.

Fourth, the flexibility of the RPS encourages least-cost compliance for generators. Generators can compare the cost of owning a renewables facility to the cost of a Credit/renewable power purchase package and to secondary-market Credits. Those who are most efficient at generating renewable power will end up producing it, and those who cannot efficiently produce it will purchase Credits on the competitive market.

Finally, and perhaps most importantly, since large generation companies will be looking to improve their competitive position in the market, they will have an interest in driving down the cost of renewables to reduce their RPS compliance costs. They may do this by lending their own financial resources to a renewables project, by seeking out least-cost renewables applications, or by entering into long-term purchasing commitments. This fosters a "competitive dynamic" that is not achieved with policies that involve direct subsidies to renewable generators without involving the rest of the electric industry.

What Are the Key Design Details of an RPS?

As with any policy, getting the details right in the initial legislation is critical to the policy's success. Three issues that are particularly important in designing the RPS are:

- Defining "renewables." The definition must be limited to those resources and technologies that are environmentally sound, that represent a small fraction of the current resource base, and that need market support. Such a definition would include wind, solar, biomass and geothermal resources. Although hydro is clearly a renewable technology, it has also been commercially mature for decades and currently represents about 10% of the power mix.
- Setting the level of the standard and its rate of increase over time. The level of the standard must begin at or near current levels of renewables and rise steadily from that point.
- Sunset date. The RPS should be "self-sun setting" meaning that the RPS policy sunsets when the price of Credits falls to zero, signifying that renewables are fully competitive and integrated into the market. A self-sunset date indicates that the RPS is intended to be a long-term policy.
- Why Is Renewable Energy Policy Necessary in Competitive Markets?
- Even "perfectly competitive" markets have inherent imperfections that are well-established in economic theory. The combination of the following market barriers will serve as powerful hindrances to renewables:
 - Externalities: Fossil fuel generators pollute the air but do not have to pay for the local, regional, and global damage caused by their emissions. Renewable energy does not pollute but, in unregulated markets, will receive no credit for the damages they prevent.
 - Public Goods: The price stability, environmental, and economic benefits of renewable energy resources are ones that accrue to the public at large, not directly to the purchasing consumer. This "free rider" phenomenon can be expected to deter consumers from volunteering to pay a little more for renewables since their purchase will benefit other, non-contributing consumers as much as it will them. Thus, while a "green market" of some size may develop, it is likely to be far smaller than what

is required to significantly diversify the nation's electricity supply and than what might be expected given the strong public support that renewables enjoy.

- **Transactions Costs:** Under retail competition, there will be high transactions costs associated with reaching consumers who are willing to pay for the public benefits of renewables.

In addition, the market reality will be that – absent the long-term contracts that have supported virtually all existing renewable energy projects, but which will be very rare in competitive markets -- investors will have very short investment horizons. In markets that will be characterized by short-term energy sales and price volatility, investors will prefer low-capital-cost technologies with short payback times. Financing for capital-intensive renewable energy projects will be expensive and difficult to obtain, even if they produce more cost-effective power over their lifetimes.

What Are the Primary Benefits of an RPS?

Renewable energy sources like wind provide environmental and economic benefits, including:

***Stable electricity prices:** Because wind and other renewables are a fuel-free source of energy, the cost of the electricity generated by such sources is stable once the facility is built and provides insurance against spikes in the price of fuels used for electricity generation. An analysis from the Union of Concerned Scientists finds switching 10% of our electricity to clean energy sources by 2020 could save consumers as much as \$13 million over 20 years.

* **Income for communities:** Every 100 MW of wind development generates about \$1 million in property tax revenue. The 160-MW wind farm in rural Prowers County, Colorado, increased the county's revenue by 29%.

***Jobs:** Every 100 MW of wind development creates about 500 job-years of employment. An increase in U.S. wind energy installations to 50,000 MW could create 150,000 jobs in the manufacturing sector alone, according to a study by the Renewable Energy Policy Project.

***Payments to landowners:** A single wind turbine can provide \$2,000-\$4,000 per year in income to landowners, mostly farmers and ranchers. The development of 1,000 MW in Texas following the adoption of that state's RPS led to royalty payments of \$2.5 million in 2002 alone.

***Zero emissions of pollution and greenhouse gases:** To generate the same amount of electricity as a single 1.65-MW wind turbine using instead the U.S. average utility fuel mix (50% coal, with the remainder produced by nuclear, natural gas, and other power sources) would result in emissions of 2,700 tons of carbon dioxide (the leading greenhouse gas), 14 tons of sulfur dioxide (the leading component of acid rain), and 9 tons of nitrogen oxides (the leading component of smog) every year. A forest measuring 1.5 square miles would be needed to absorb the same amount of CO₂.

For more information on the RPS, contact AWEA at:

1101 14th St., NW, 12th Fl

Washington, D.C. 20005

Tel (202) 383-2500 – Fax (202) 383-2505

www.awea.org



U.S. Senate Passes Renewable Portfolio Standard

FOR IMMEDIATE RELEASE:

April 25, 2002

Contact:

Tom Gray (802) 649-2112

Christine Real de Azua (202) 383-2508

U.S. SENATE MAKES HISTORY BY PASSING RENEWABLES PORTFOLIO STANDARD

AWEA Predicts Continued Expansion of Wind Power Under New Law Requiring Greater Use of Renewable Energy

The American Wind Energy Association (AWEA) applauded today's passage by the U.S. Senate of a federal renewable energy portfolio standard ("renewables portfolio standard," or RPS) and a full five-year extension of the wind energy production tax credit (PTC) as part of the broad energy bill, S. 517. The bill also would create a new investment tax credit for small wind systems used to power homes, farms, and small business.

The RPS included in S. 517 would require that an additional 1% of the nation's electricity come from new renewable energy sources by 2005 and increase slowly each year thereafter, until renewable energy provides 10% of the national electricity supply by 2020. A credit trading system would be established so that utilities could comply with the renewables requirement in the most cost-effective manner. The PTC, which provides an incentive of 1.5 cents per kilowatt-hour (adjusted for inflation) for electricity generated during the first 10 years of operation of a new wind plant, would be extended until Dec. 31, 2006. The new investment tax credit for small wind systems (75 kilowatts and below) would cover 30% of system costs for both residential and business uses. This tax credit was championed by Sen. Dick Durbin (D-Ill.).

"The Senate's passage of an RPS signals a firm commitment to fully capitalize on America's enormous renewable resources," declared AWEA Executive Director Randall Swisher. "The Senate energy bill will help pave the way for increased development of renewables by requiring electricity suppliers to look seriously at adding these clean, domestic energy sources to their power mix. We believe that once they do, wind will prosper because it is one of the most cost-effective renewables. In fact, with continued federal leadership and industry development, we estimate that wind energy can provide as much as 6% of the nation's electricity by 2020, or more than half of the renewable total required in the Senate-passed bill."

"Senate passage of an RPS marks a milestone in U.S. energy policy," commented AWEA Legislative Director Jaime Steve. "The federal government has been talking about renewable energy for 25 years, but this proposal, if enacted into law, would be the first concrete step toward making it happen. And the inclusion of a provision to extend the PTC makes this bill a real one-two punch for development of renewables: it will be extremely helpful in encouraging wind energy's continued rapid growth."

Steve congratulated Senate Majority Leader Tom Daschle (D-S.D.) and Senators Jeff Bingaman (D-N.M.), and Harry Reid (D-Nev.) for their leadership in winning passage of the provision: "Sens. Daschle, Bingaman, and Reid have demonstrated outstanding leadership in sticking with the RPS concept and shepherding it through the legislative process. We salute them and the rest of the 58 Senators who consistently supported the RPS." Steve also thanked Sens. Chuck Grassley (R-Iowa), Byron Dorgan (D-N.D.), Kent Conrad (D-N.D.), Jim Jeffords (I-Vt.), Max Baucus (D-Mont.), and Gordon Smith (R-Ore.), for their strong support of the PTC.

"A federal RPS has huge economic development implications for rural America," Swisher said, "promising new jobs in many wind-rich states while bringing a 'second crop' to many landowners and

new tax revenue to many local governments." A 100-megawatt (MW) wind plant (capable of supplying the electricity needs of 28,000 homes) will provide \$5 million in payments to landowners and \$12.5 million in wages over its 25-year lifetime.

Some \$3 billion worth of wind power investments (about 3,000 megawatts, or enough to supply the needs of 850,000 homes) are being proposed or planned for the next several years in the U.S., according to AWEA estimates. There are now wind turbine installations in 26 states providing 4,261 MW of clean, renewable wind energy to consumers nationwide.

S. 517 now goes to a joint House-Senate conference committee where differences between it and the House-passed energy bill, H.R. 4, will be resolved. The House bill has no RPS provision, but does include a five-year PTC extension.

Links to Electric Co-ops, Utilities, and Organizations

<http://kayelectric.com/index.htm>

<http://www.oge.com/es/wp/wind-power-faq.asp>

<http://www.wfec.com/>

<http://www.oaec.com/>

[http://wire0.ises.org/wire/Publications/Research.nsf/DefaultView/2573209718D564D1C125690E004C6DF2!
Open](http://wire0.ises.org/wire/Publications/Research.nsf/DefaultView/2573209718D564D1C125690E004C6DF2!Open)



CNE Mission Statement

Cherokee Nation Enterprises supports the economic self-reliance of the Cherokee Nation.

CNE Vision

CNE's vision is to be the model tribal enterprise delivering superior value to our customers and providing financial independence to the Cherokee Nation through sustained growth, job creation and business development.

CNE Long Term Goals

CNE's goals are aligned with the Cherokee Nation Declaration of Designed Purpose, which can be described by the Cherokee word "ga du gi" meaning working together as individuals, families, and communities for a quality of life for this and future generations by promoting confidence, tribal culture, and an effective sovereign government. CNE remains focused on these objectives:

- *Driving profitability through managed, sustained growth;*
- *Maximizing gaming opportunities;*
- *Providing dividends to the Nation based on CNE profits achieved over the long term;*
- *Creating jobs with career paths for Cherokees;*
- *Promoting profitable, sustainable cultural tourism within the 14-counties of the Cherokee Nation; and*
- *Conducting business in a manner consistent with Cherokee values.*

Brand Positioning Statement

Motivate customers to make a brand choice – "Cherokee Casino"

Cherokee Casino is a community-oriented gaming company offering our guests a superior experience by providing a safe environment, quality facilities, exceptional customer service and entertainment choices that meet or exceed customer expectations.

Green Tag Certification

Every time you switch on your lights, resources are used to generate your electricity. 98% of electricity produced in the United States comes from non-renewable resources such as polluting fossil fuels and nuclear power.¹ **These non-renewable sources of electricity are the number one cause of global warming in the United States.**² There are huge differences between the types of resources used to meet our country's electricity needs. The remaining 2% of the electricity produced is generated from renewable resources, such as wind, solar, geothermal, small hydro and biomass, which cause dramatically less air pollution and environmental damage.

The Green-e logo is a nationally recognized symbol to help consumers identify superior, certified renewable energy products³. Green-e is the nation's leading independent certification and verification program for renewable energy products. If you are interested in getting your renewable energy product certified, please visit the [Green-e Program Summary](#) to learn more.



In some states, you can CHOOSE what type of power you would like to buy. In other states, your utility company may offer a renewable (green) power option as an alternative to the regular electricity you currently buy to power your [home or business](#). Regardless of your location, you can choose to purchase Tradable Renewable Certificates ([TRCs](#)) to offset your energy use. When you see the Green-e logo, you can be assured you're getting environmentally superior renewable energy.

On this website you can see [Green-e certified energy options](#) available in your area, read about the [health](#) and [environmental benefits](#) of renewable power, and see which [businesses](#) have switched to renewable power.

***Throughout this website, your electricity "offering," "option" or [TRC](#) will be called an energy product.** If you have questions about a definition, please visit the [Green-e Dictionary](#).

Clipper Wind Brochure



2.5 MW Wind Turbine

CERTIFICATION: Germanischer Lloyd
 State of Compliance for Design Assessment
 #WT00-006A-2005



General

Type	Horizontal axis, 3 blades, upwind
Power output	2500 kW System power output
Components	Purpose designed by Clipper
Primary brake	Blade pitch (aerodynamic)
Operation	Variable speed 9.7 to 15.5 rpm
Yaw	Electromechanical
Hub height	80m (standard)

Rotor

Wind Class	Class I	Class II	Class III
Diameter	89m	93m	99m
Swept area	6221m ²	6793m ²	7698m ²
Blades	Clipper 43.2m, 45.2m, 48.2m		
Tilt	5.5°		
Tip speed @ rated output	75 m/s		
Rotor lock	Integrated into base, hydraulic		
Rotor turning gear	Manual, high torque		

Pitch system

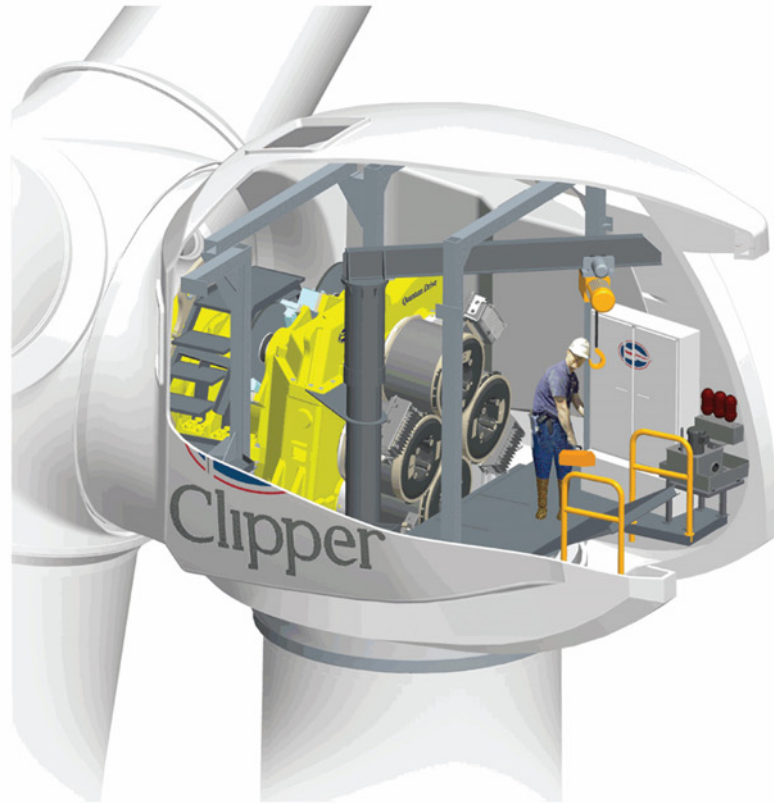
Type	Individual blade pitch
Drive	DC electric servo-drive
Failsafe braking	Battery banks
Blade bearings	Internal gear, dual row ball-bearing

Hub

Type	Spherical
Material	Ductile cast iron

Parking brake

Type	Twin discs, active hydraulic
Location	Intermediate stage of gearbox



Power Train

Generator Type	Clipper D-GEN, Quantum, Distributed generation
Rated power	2735 kW
Gear arrangement	2-stage, high-contact ratio
Mainshaft	Forged steel, integrated with gear housing
Lubrication	Forced, mechanical pump
Filtration	Multi-element; inline coarse/fine and offline filter system
Cooling	Radiator, external to nacelle
Gearbox mounting	Stable, non-floating

Controller

Voltage-3 phase	690 VAC, 480 VAC, 240 VAC
Voltage-single phase	120 VAC
Computer	Embedded power PC
Operator interface	Palm Top or laptop PC
SCADA	Fiber optic connections, serial interface

Generators

Type	Clipper Permanent Magnet (Synchronous)
Number of units	4
Rated power (each)	656 kW
Voltage	1000-1350 VDC
Enclosure	IP54
Cooling	TEWAC (IP54) enclosed water/air-cooled external radiator
Windings	Form-wound, insulation Class H
Operation	Continued operation with one generator outage

Power Converter

Type	IGBT, 4 modules rectifier/converter
Voltage	690 VAC
Frequency	50 ± 3Hz, 60 ± 3Hz

Condition-based monitoring

Blade strain measurement
 Real time gearbox oil analysis
 Bearing temperatures
 Vibration monitoring
 Hydraulic system pressures

Access

Nacelle top-hatch, nacelle aft roll-down door,
 hub entry from nacelle interior, spinner hatches

Lightning protection

Blade Tip + 2 receptors,
 internal ground conductor
 Nacelle Air termination, full shielded,
 (Faraday cage)
 Electrical IEC 61400-24 level III

Noise performance

SPL @8 m/s 104 db(A), according to
 IEC 61400-11 (very quiet)

Environmental limits

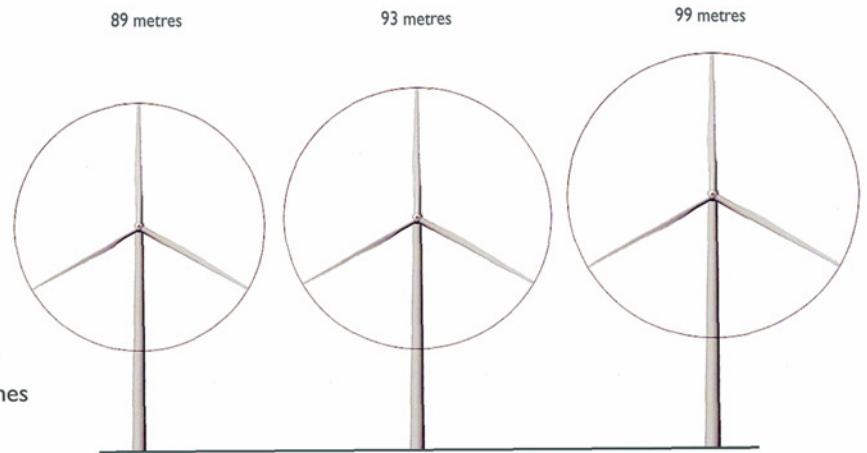
Survival wind velocity Based on IEC IA, IIA, IIIA
 Ambient temperature Standard Cold Survival
 -20° to +40°C -40° to +40°C -40° to +50°C

Tower

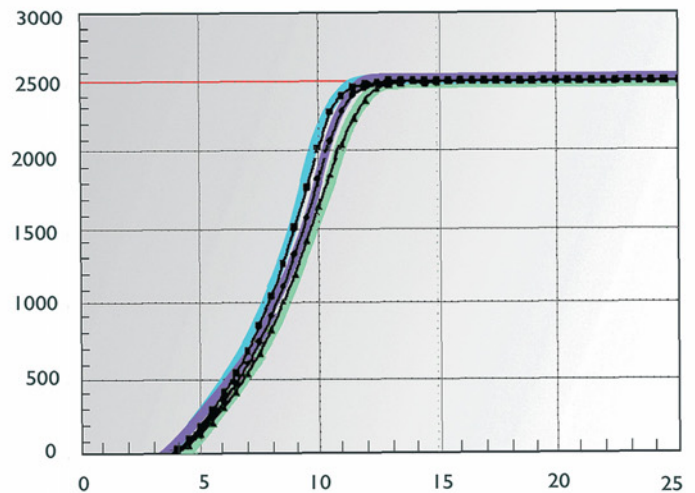
80m hub height, optional to height available
 Type Tubular
 Material Steel plate
 Sections 4 (80m hub height)

Lifting requirements

80m hub height same crane size as most
 1.5 MW turbines.



Power curve / kW



Hub height wind speed (m/s) ■ C99 (class III) ● C93 (class II) ▲ C89 (class I)

Cut-in wind velocity	Cut-out wind velocity	Cut-out wind gust
4 m/s - 10 min. avg.	25 m/s - 10 min. avg.	29 m/s - 5 sec. avg.



**The
Company**



Servicing the Global
Wind Market

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Contact Us

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Tel: 805-690-3275
Fax: 805-899-1115
Email: info@clipperwind.com

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Fax: 301-263-0042

Iowa
201 East 9th Street
Storm Lake, IA 50588
Tel: 712-732-8344
Fax: 712-732-8348

Colorado
1821 Blake Street
Denver, CO 80202
Tel: 303-295-7320
Fax: 303-295-7325

CLIPPER UK

9th Prince Consort House
27-29 Albert Embarkment
London SE1 7TJ
Tel: 44-20-78-20-1078
Fax: 44-207-340-0177

MEXICO

Mexico City
Clipper/Fuerza Eolica
Avenida Año de Juarez # 205
Colonia Granja San Antonio
Mexico D.F, Mexico 09070
Tel: 011-52-55-56-86-73-03
Fax: 011-52-55-56-86-70-06

Leon

Carretera Santa Rosa
Plan de Ayala, Km 2.5
Leon, Guanajuato 37490
Tel: 011-52-47-77-48-83-98

Production Tax Credit Letter

WindPower Investments LLC

5487 N. Milwaukee Avenue
Chicago, Illinois 60630-1249

773-792-1310

Fax: 773-792-8358

ONEILLCHICAGO@HOTMAIL.COM

April 20, 2006

VIA E-MAIL

Mr. Joseph Brignolo
Project Developer
Cherokee Nation Enterprises
P. O. Box 506
Lebanon, Ohio 45036
Brignolo@soncov.com

Re: **Proposal for the Assignment and Monetization of Section 45 Tax Credits**

Dear Joe:

WindPower Investments LLC is interested in working with your entity to allow you to realize revenues from the Section 45 Tax Credits which your plant earns for the production of electricity from a renewable source but may not be able to use. By forming a new entity that will involve both your company and an investor that can utilize federal tax credits, it will be possible to allow your project to realize revenues from the section 45 tax credits without forfeiting any of your present management control, income, benefits from depreciation or ability to use the project as collateral for other financing. WindPower Investments LLC will provide a private letter ruling from the IRS to ensure the transfer of tax credits and will supply the required legal and accounting services to draft the contracts, form the entities, transfer payments and prepare tax returns to allow the transfers of tax credits and payments to occur.

Section 45 of the Internal Revenue Code grants a party that produces and sells electricity generated from renewable sources – including wind turbine power – a tax credit. The credit was established at 1.5 cent for each kilowatt hour of electricity produced by the taxpayer at a qualified facility and is annually adjusted for inflation. Presently, the inflation-adjusted credit is 1.8 cents. The credit is paid for each kilowatt hour of power produced from the facility within ten years of the date the facility is placed in service. The tax credits are not transferable and can only be used by the project owner during the tax year in which the power is generated and sold.

Because of the limited “taxable” income many wind turbine projects generate, a taxpayer that has no other source of taxable income will often not be able to benefit from the tax credits. Further, individual investors in the project are further limited on the use of the tax credits if they are classified as “passive” participants in the project. As a passive participant, the tax credits will flow through to them as passive income tax credits and may only be used as a credit against the investor’s passive income tax liability.

Given these limitations on the use of the tax credits, many projects and investors do not realize any advantage from the incentive created under Section 45 of the Internal Revenue Code. However, by transferring the assets of the project to a limited liability company and assigning a member’s interest in the LLC to an investor that can use the tax credits, the original project owner can realize revenues from the tax credits. Under our plan, we will assist wind turbine project owners and developers in reorganizing their present ownership structure to allow for the transfer to a single purpose entity – WindPower LP – of a vast majority of the tax credits for which the project qualifies. WindPower Investments, LLC will prepare the contracts required to establish the required legal entities and to allow the desired transfer assets, funds and tax credits.

The entities will be structured such that the investor will own the project to the extent required for it to receive the tax credits but the day-to-day control of the project's operation will remain with the present project owner. The present project owner will receive payments from WindPower LP in exchange for the assignment of the project assets to the new entity. The acquisition of the vast majority of the new ownership entity will allow WindPower LP to receive the vast majority of the tax credits for which the project qualifies.

In exchange for the assignment of the project assets to the new entity, the original project owner will receive a combination of fixed and contingent payments based on the anticipated and actual tax credits earned by the project. Capital contributions made by the investor will be paid to the project owner as payments for the sublease of the project site and as fees for operating the project. The operating profit from the project will be assigned to the original project owner as management fees. While it is anticipated that most of the projects will realize an operating project, the investor will be responsible for covering any operating expenses in excess of cash flow through capital contributions to the new entity. However, the contingent note payments due to the original project owner will be reduced by any amount it pays as capital contributions.

Because WindPower LP and the tax credit investor will own a vast majority of the new entity that will be assigned the project assets, WindPower LP and the investor will receive the vast majority of the tax credits earned by the project. However, because the original project owner is contributing the project to the new entity while WindPower LP (and consequently the investor) is making only a minor initial capital contribution, the majority of the profits and losses for tax reporting purposes will be assigned to the original project owner.

The agreement for the formation of the new entity will include provisions that will result in the ownership of the project returning to the original project owner after the tax credits have expired. At that time, the original project will be returned to exactly the same position it had before entering into the agreements to assign the tax credits.

WindPower Investments, LLC will be responsible for identifying and qualifying the tax credit investors interested in participating in the project. We presently have investors interested. Once we have commitments to participate from suitable wind turbine project owners and operators, we expect to be able to initiate the program and begin realizing revenues in a relatively short period of time.


As previously mentioned, WindPower Investments LLC will be responsible for the drafting of contracts and formation of entities to accommodate the transfer of assets and funds and will continue to service the project by preparing invoices, sending payments, maintaining accounts and preparing tax returns. Further WindPower Investments LLC will apply for and receive a Private Letter Ruling from the IRS to support the fact that the proposed structure yields the desired results.

We are confident that our program will be of great benefit to any wind- turbine project that is not able to utilize its Section 45 Tax Credits. We would welcome your participation in this plan. We have prepared a detailed proposal for this idea and we would welcome the opportunity to send it to you and further discuss your participation. If you think you could benefit from this program or have any interest, please contact us. We will be glad to send you a copy of the proposal and answer any questions.

Sincerely,

David S. O'Neill

OG&E Wind Power Residential Sign-Up



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- Benefits of Wind Power •
- How Wind Turbines Work •
- OG&E Wind Farms •
- Useful Links •



Sign Up For Your Home (Oklahoma Residential Customers Only)

Due to overwhelming response to our wind power program, OG&E is currently sold out of wind power and has reached capacity on the waiting list. Therefore, we are not accepting wind power subscriptions at this time.

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Project Pre Execution Checklist and Assignment of Responsibilities

WTG Purchase Checklist

Project: Chilocco
Description: Wind Farm

Item	Responsible Person	Status	Comment
------	--------------------	--------	---------

Sales Agreement

WTG Sale LOI received from WTG Manufacturer	ATTY		
Warranty Sale LOI received from WTG Manufacturer	ATTY		
Final Turbine Supply Agreement with Exhibits Prepared	ATTY		
Final Warranty Agreement with Exhibits Prepared	ATTY		
Final Documentation for Customer TOC Prepared	ATTY		

Micro-Siting

- Signed Climatic Data Sheet from Independent Engineer
- Physical Site Micro-Siting Survey
- Micro-Siting WTG Layout Verified / Optimized
- Production Performance Analysis Reviewed
- Climatic Risk Analysis Assessment

Project Schedule

- Project Team Responsibility Matrix
- Project Milestone Schedule Prepared & Agreed to
- Detailed Project Schedule

Project & Service Staffing

- PMs Assigned by all contractors
- CMs Assigned by all contractors
- CMs on-site dates confirmed
- TA's Assigned by WTG Manufacturer
- TA's on-site dates confirmed
- Blade Repair Technicians Identified
- Blade Repair Technician Schedule confirmed
- Commissioning Staff Assigned
- Commissioning Staff Schedule confirmed
- Project Office Staffing Plan
- Site Safety Personnel Identified
- Service Office Staffing Plan

Training

- Plan & Schedule for CM Training
- Plan & Schedule for TA Training
- Plan & Schedule for Erection Personnel Training

Plan & Schedule for Commissioning Techs Training

Finance

- Pro-forma Complete
- Pro-forma approved by finance sources
- Accounting Review of pro-forma by Tax CPA
- Capital ERP Complete
- Capital Cash Flow Schedule
- O&M Cash Flow Schedule
- Payment Security Instruments in Place
- Work Performance Security Instruments in Place
- Currency Hedging Contracts in Place

Project Permitting

- All Project Permits Secured
 - Land use
 - Storm Water
 - Construction
 - DOT
 - Environmentally Sensitive Areas
 - Environmental Impact Assessment

Subcontract Preparation

- Design Engineering Contracts
 - Foundation PE Contract
 - Tower PE Contract
 - Site Civil Works Design Contract
 - Electrical BOP Design Contract
- Construction & Erection Contracts
 - Site Civil Works Construction Contract
 - Electrical BOP Construction Contract
 - SCADA Comm Network Installation Contract
 - Foundation Construction Contract
 - WTG Erection Contracts
- Transportation Contracts
 - Tower Inland Transport Contract
 - Nacelle/Blades Inland Transport Contract

- Subcontract Risk Assessment

Engineering & Design

- Civil Works & BOP Design
 - Site Civil Works Design
 - WTG Mfg review of Site Civil Works Design

Substation Design
Collection System Design
WTG review of Electrical BOP

Towers & Foundations

Tower Design
Tower Design Approved by PE
Foundation Design
Foundation Design Approved by PE

SCADA

SCADA Specification
SCADA H/Ware & S/Ware Design
SCADA Fiber Optic Network Design

Miscellaneous

MET Tower Specification
Engineering Spec for Project Purchases Issued

Tools

Tool Manifest Complete and Issued by WTG Mfg
Tool Availability Confirmed
Project Tool Security Plan in Place
Foundation Template Ring Availability Confirmed

SCM

Civil Works Purchases
Foundation Mtrls Source of Supply Identified
PO's for Foundation Mtrls Issued
Delivery Date Confirmed for Foundation Mtrls

Electrical BOP Purchases

Substation Source of Supply Identified
PO's for Primary Substation Items Issued
Delivery Date Confirmed for Substation Items

Tower Purchases

PO's for Towers Issued & confirmed
Tower Source of Supply Identified
Tower Shop Drawings Issued to Mfg
PO's for Tower Mtrls have been Issued
Tower QA Inspections Scheduled
Tower Ex-Factory Dates Confirmed

SCADA Purchases

PO for SCADA Issued
SCADA Delivery Date confirmed

PO for SCADA Communications Hardware Issued
SCADA Comm H/Ware Delivery Date Confirmed

Project Purchases

Project Purchases Identified
Project Purchases Source of Supply Identified
Project PO's Issued
Project Purchases Delivery Dates Confirmed

Project Spares Inventory

Project Spares Manifest Prepared and Issued
Project Spares PO's Issued
Project Spares Delivery Dates Confirmed

Service Spares Inventory

Service Spares Manifest Prepared and Issued
Service Spares PO's Issued
Service Spares Delivery Dates Confirmed

Transportation

Transportation Surveys Complete
Transportation Permits Secured
Ocean Transport Date of Arrival Confirmed
Port Inspections Scheduled
On-Site Delivery Dates Confirmed for Nacelles &
Blades
On-Site Delivery Dates Confirmed for Towers
Return Shipment Plan Prepared

Construction, Erection, & Commissioning

Erection Documents Transferred to Erector
Crane Eqpmt Reservations Made
Crane Mobilization Dates Confirmed
Erectors on Site Date Confirmed
Per Unit Erection Schedule Prepared
Per Unit Commissioning Schedule Prepared
Site Safety Plan in Place
Emergency Call Number List Prepared
Project Communication Plan Prepared

Documentation

Project Documentation Plan Complete
Online Project Profile Complete
All Project Documentation Properly Archived

Service Office

Service Office Location Identified

Special Concerns

Analysis of a 10-percent Renewable Portfolio Standard

Analysis Methodology

The projections and quantitative analysis for this paper were prepared using the Electricity Market Module (EMM) of the National Energy Modeling System (NEMS). NEMS is a computer-based, energy-economic model of the U.S. energy system for the mid-term forecast horizon, through 2025. NEMS projects production, imports, conversion, consumption, and prices of energy, subject to assumptions about macroeconomic and financial factors, world energy markets, resource availability and costs, behavioral and technological choice criteria, cost and performance characteristics of energy technologies, and demographics. Using econometric, heuristic, and linear programming techniques, NEMS consists of 13 sub modules that represent the demand (residential, commercial, industrial, and transportation sectors), supply (coal, renewables, oil and natural gas supply, natural gas transmission and distribution, and international oil), and conversion (refinery and electricity sectors) of energy, together with a macroeconomic module that links energy prices to economic activity. An integrating module controls the flow of information among the sub modules, from which it receives the supply, price, and quantity demanded for each fuel until convergence is achieved.

Domestic energy markets are modeled by representing the economic decision-making involved in the production, conversion, and consumption of energy products. For most sectors, NEMS includes explicit representation of energy technologies and their characteristics. In each sector of NEMS, economic agents—for example, representative households in the residential demand sector and producers in the industrial sector—are assumed to evaluate the cost and performance of various energy-consuming technologies when making their investment and utilization decisions. The costs of making capital and operating changes to comply with laws and regulations governing power plant and other emissions are included in the decision-making process.

The EMM simulates the capacity planning and retirement, operating, and pricing decisions that occur in U.S. electricity markets. It operates at a 13-region level based on the North American Electric Reliability Council (NERC) regions and sub regions. Based on the cost and performance of 27 different generating technologies, the costs of fuels, and constraints on emissions, the EMM chooses the most economical approach for meeting consumer demand for electricity. As new technologies penetrate the market in NEMS, their costs are assumed to decline to reflect the expected impact of technological learning. During each year of the analysis period, the EMM evaluates the need for new generating capacity to meet consumer needs reliably or to replace existing electric power plants that are no longer economical. The cost of building new capacity is weighed against the costs of continuing to operate existing plants and consumers' willingness to pay for reliable service.

The EMM includes the representation of programs aimed at increasing the amount of generation coming from renewable fuels – both State and federal programs. For example, 10 States currently have State renewable portfolio standards or targets. To represent these programs, estimates of the types of renewable capacity expected to be encouraged by these programs are made and entered into the model. All cases in

this analysis include estimates of new renewable energy capacity expected to be stimulated by State-level renewable programs. Over the 2002 to 2025 timeframe, these estimates include 3,488 megawatts of capacity resulting from State RPS programs, and 1,718 megawatts expected under other State renewable stimulus programs. Capacity built under State RPS programs reduces the incremental quantity needed to comply with a Federal RPS and lowers its costs. The costs of complying with the State RPS programs are not included in the costs attributed to the Federal RPS program in this analysis.

All cases in this analysis include the 10 percent investment tax credit for new geothermal and solar-electric power plants that was permanently extended in the Energy Policy Act of 1992. Treatment of the 1.8 cent per kilowatt-hour production tax credit for wind and biomass conforms to the requested analysis and is discussed later in this section.

A. Update to the Annual Energy Outlook 2003 Reference Case

NEMS has been updated to reflect changes in electric generating capacity since *AEO2003* was completed in November of 2002 and to incorporate revised expectations about near-term natural gas price trends. The following summarizes these key updates.

Generating Capacity. Within NEMS, only planned units that are reported as “under construction” are automatically included as being built during the forecast horizon. Additional renewable capacity expected from State-level mandates and programs are also included in the capacity projection. NEMS then forecasts the construction of additional unplanned capacity by type as needed to meet future demand.

For *AEO2003*, the information on planned generating units was based predominantly on 2001 data from the EIA-860 filings, “Annual Electric Generator Report,” which provides information from both utility and non-utility generators. The EIA-860 data was supplemented by a second data source, the NewGen database developed by Platts Database,⁵ which is updated on a monthly basis. The *AEO2003* contained data capacity plans from these sources as of July 2002. The NewGen database was used to update the EIA-860 information for more recent changes in plant operating status.

Based on new information available as of the end of March 2003, about 24 gigawatts of additional planned capacity are reported as being under construction, including 8.5 gigawatts in 2002, 14.3 gigawatts in 2003 and 1.2 gigawatts in 2004. About 16 gigawatts of the additions are gas-fired combined cycle, 4.6 gigawatts are gas-fired turbines, and 2 gigawatts are dual-fired combined cycle units. The remaining 1.4 gigawatts are composed of dual-fired turbines and internal combustion units, several renewable units, and a relatively small coal unit.

Natural Gas Prices. Each month, EIA publishes 2-year projections of price, demand and supply, and stocks for each of the main energy sources in the *Short-Term Energy Outlook* (STEO). These projections are revised in response to observed changes in weather conditions, stock levels, and market conditions. For *AEO2003*, the September 2002

STEO was the basis of the short-term outlook. Since then, the natural gas price forecasts have changed significantly. For example, the average natural gas wellhead price for 2003 was projected to be \$4.52 (nominal dollars) per thousand cubic feet in April 2003, about 40 percent higher than the projection for 2003 used in *AEO2003*. To better align with the more recent market information, the natural gas supply and price forecasts were aligned with the April 2003 STEO forecasts. In particular, adjustments were made to natural gas production, imports, supplemental supplies, storage, consumption of lease, plant, and pipeline fuel, and prices at the wellhead and the burner-tip. These adjustments mainly affect the short-term projections, but since decisions made in the later years partially depend on earlier market conditions, the longer-term projections are also affected.

B. Representing the RPS

To represent a national RPS, the EMM has the ability to require that generation from renewable facilities (including all generation from cogenerators) be equal to or greater than a specified share of total annual generation. When this is done, the most economical renewable options are constructed to meet the RPS requirement. The projected price of the renewable credits represents the incentive needed by the last increment of renewable capacity added to make it competitive with other options. The renewable credit price times the required generation in each year becomes part of the operating costs of non-qualifying facilities because sellers of power from these facilities must purchase renewable credits for them in order to comply with the required RPS share.

The proposed RPS allows new (incremental) hydroelectric capacity at existing facilities to qualify for renewable credits. While it is possible that incremental hydroelectric capacity could play a small role in meeting the RPS, EIA believes that it is not likely to have a large impact and, thus, it is not directly represented. The U.S Hydropower Resource Assessment found that upgrades at existing hydroelectric facilities could add 7.8 gigawatts to total hydroelectric capacity⁶. However, after adjusting this value to reflect environmental concerns, the report authors reduced estimated hydro potential to a maximum of 4.3 gigawatts of possible upgrades at existing sites. The report also included estimates of additional hydroelectric capacity at currently undeveloped sites, but since the proposed RPS does not provide renewable credits to new hydroelectric sites, their development will not be encouraged by the RPS. Assuming a 45 percent capacity factor for typical hydroelectric facilities, at most, 4.3 gigawatts of incremental hydroelectric facilities could provide 17 billion kilowatt-hours of additional generation, or approximately 3.7 percent of the increase in renewable generation needed to comply with this RPS. However, because cost estimates for these potential upgrades are not available, it is impossible to determine if they would be economical. If they were economical, their development would be expected to lower the costs of implementing the RPS slightly below what is reported in this paper.

To represent the specific requirements of the proposed RPS program, the annual qualified renewable share of sales called for in the proposed amendment was converted into total non-hydroelectric renewable shares. As shown in Table 1, the shares used in NEMS differ from the annual RPS shares called for in the request because the NEMS shares represent the total non-hydroelectric renewable generation share - including the generation from facilities that began operation before January 1, 2004 - required to comply with the RPS requirement (NEMS does not distinguish between generation coming from new or existing facilities so total non-hydroelectric renewable shares are used). Also, the share represented in NEMS is adjusted to account for the exclusion of utilities with sales fewer than 4,000,000 kilowatt-hours, and the exclusion of renewable generation from sales when applying the RPS share. For example, in 2008 the proposed RPS share is 2.5 percent, total electricity sales are projected to be 3,938 billion kilowatt-hours, sales from small utilities are assumed to be 711 billion kilowatt-hours, the generation from non-qualifying non-hydroelectric renewable generators (those

Table 1. Renewable Generation Share of Sales Required

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Year	Legislative Target	NEMS Equivalent Target
2003	0.0	0.0
2004	0.0	0.0
2005	0.0	0.0
2006	0.0	0.0
2007	0.0	0.0
2008	2.5	3.8
2009	2.5	3.8
2010	2.5	3.8
2011	2.5	3.8
2012	5.0	5.5
2013	5.0	5.5
2014	5.0	5.4
2015	5.0	5.4
2016	7.5	7.1
2017	7.5	7.1
2018	7.5	7.1
2019	7.5	7.1
2020	10.0	8.7
2021	10.0	8.7
2022	10.0	8.7
2023	10.0	8.7
2024	10.0	8.7
2025	10.0	8.8

coming on prior to January 1, 2004) are assumed to be 82 billion kilowatt-hours and the generation from hydroelectric facilities is projected to be 300 billion kilowatt-hours. Using this information, the amount of qualified renewables required is calculated as follows:

$0.025 \times (3,938 - 711 - 82 - 300) = 71$ billion kilowatt-hours of new non-hydroelectric renewable generation.

Converting this into the total non-hydroelectric share used in NEMS gives (adding required new generation with non-hydroelectric renewable generation existing before enactment of the program, then dividing by all generation): $(71 + 82) / 3,938 = 3.9$ percent.

As shown, through 2015 the adjusted shares used in NEMS exceed the shares called for in the proposal because the effect of including existing non-hydroelectric renewables in the NEMS values exceeds the adjustments for excluding small utility sales and total renewable generation from the base. After 2015, however, the exclusion of total renewable generation from the baseline when applying the RPS share causes this relationship to reverse.

The request from Sen. Bingaman indicates that the price of a renewable energy credit should be capped at 1.5 cents per kilowatt-hour. Furthermore, it specifies a penalty of the lesser of 1.5-cents per kilowatt-hour or twice the average credit value may be imposed on retail electricity suppliers who do not submit sufficient renewable credits to cover their sales. For analysis purposes, this maximum 1.5-cent per kilowatt-hour/200% noncompliance penalty is treated the same as the cap on the renewable credit price. If the marginal cost of new renewable capacity in a given year is too expensive even with a 1.5 cent per kilowatt-hour credit, the required level of qualifying renewables will not be achieved. In this case, the marginal renewable credit purchaser will pay the government for non-compliance rather than build new renewables. This cap is not indexed to inflation. In previous analyses of RPS programs with allowance price caps, EIA has assumed that the price cap was indexed to inflation (that is, in real dollars rather than nominal dollars)⁷. By treating the price cap as nominal for this analysis, the real ceiling on renewable energy credit prices gets lower over time, as shown in Table 2⁸.

The current PTC provides an inflation-indexed, 1.8 cent per kilowatt-hour (in 2003) tax credit for the first 10 years of generation from qualifying facilities. Qualifying facilities include wind and certain biomass processes (“closed-loop” facilities and facilities burning poultry waste) placed in service on or before December 31, 2003. The proposed program includes a provision to extend the eligibility date for facilities placed in service on or before December 31, 2006. In addition, the proposal expands the eligible renewable technologies to include open-loop biomass at both new and existing facilities as well as new geothermal, solar, small irrigation power, and municipal biosolid and sludge recycling facilities. For biomass generation at existing facilities, the proposed PTC provisions set the value and pay-out period at 1.0 cents per kilowatt-hour and 5 years, respectively.

NEMS does not model poultry waste, small irrigation power, or biosolid/sludge technologies. EIA believes that the total resource base for these technologies is quite small relative to other renewables and the electricity market as a whole. While eligibility for the PTC may cause significant growth in these

Table 2. Nominal and Real Value of Renewable Energy Credit Cap

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Year	Nominal Credit Cap (mills per kilowatt-hour)	Real Credit Cap (year 2003 mills per kilowatt-hour)
2003	15.00	15.00
2008	15.00	13.32
2009	15.00	13.05
2010	15.00	12.81
2011	15.00	12.57
2012	15.00	12.30
2013	15.00	12.00
2014	15.00	11.70
2015	15.00	11.40
2016	15.00	11.10
2017	15.00	10.80
2018	15.00	10.51
2019	15.00	10.21
2020	15.00	9.92
2021	15.00	9.64
2022	15.00	9.37
2023	15.00	9.10
2024	15.00	8.83
2025	15.00	8.56

sectors relative to their current sizes, such growth would not significantly impact the renewable energy or electricity markets.

The proposed program also modifies the PTC by removing the inflation index provision. This effectively reduces the value of the PTC to the project developer over the 10-year pay-out period, as the effective tax credit does not keep pace with inflation. This is modeled in NEMS by reducing the value of the PTC each year based on the forecast growth in the Gross Domestic Product index.

[Notes and Sources](#)