Hilltop Power, LLC

Final Report

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Project Title: Hilltop Power LLC		
Contract Number: EP-26		Report Date: 2/26/09
Principal Investigator: Evan Johnson 952-542-9355		
Progress Summary: Milestone # 1 (Contracts & Agreements) (100 % complete) Milestone # 2 (Turbine Specifications and Order) (100 % complete) Milestone # 3A (Design Engineering) (100 % complete) Milestone # 3B (Foundation and Site Preparation) (100 % complete) Milestone # 4 (Construction) (100 % complete) Milestone # 5 (Commissioning Certificate) (100 % complete)		
Contract Contact: Evan Johnson ph 952-542-9355 email ejohnson@thermetic.com		
Congressional District: (Corporate office) District three (3)	Congressional District: (Project location) District one (1)	

Executive Summary

The original project proposal as submitted in February of 2004 called for a 1.5MW turbine with total project cost of 1.6 million. The cost of the turbine in 2004 was just over 1 million with delivery of six months. The length of time involved between proposal submittal and grant contract approval was approximately 2 years. In that two years many changes occurred in the market with tax credit approval, turbine pricing and availability. This called for us to modify just about every aspect of the original proposal in an effort to meet the original project objectives. Also, it required Hilltop Farm and its members to bare much more financial risk than originally proposed.

1. Because none of the major turbine suppliers would talk to single turbine projects we went with a new US manufacturer in DeWind.

2. Because the cost went up dramatically we had to be creative in the financing yet stay within the limits of the grant contact of maintaining 100% ownership within the LLC

What helped us move along the way was advice from experienced people such as Dave Norgaard of SW Wind Consultants, legal work from Kevin Walli, accounting information from Pat Louwagie and general contracting from Jay Gislason.

The details of the how the work done met the benefits and goals are detailed below:

Goals and Objectives: (As presented on original proposal)

Remove variables and follow plan:

- Utilize:
  1. Sound Technology
  2. Quality work approach
  3. Minnesota labor in every possible application
- Follow:
  1. Schedule as set in Appendix C (ref original proposal)
  2. Reporting as defined in Appendix C (ref original proposalL
  3. Deliveries and milestones as detailed in Appendix C (ref original proposal)
- Spread:
  1. Knowledge to Minnesota workers
  2. Experience to local professionals
- Provide:
  1. Clean and economical power
  2. Approx. $ 40,000 over 15 years to Prairie Island Indian Community.

Because of the time frame and huge changes in the wind production market and US economy this required us to stay light on our feet. The plan had to evolve to meet these changes. We basically had to work with each variable as it was dealt in order to achieve the goals and objectives.

Challenges

- **Delays**
  1. The length of time for official approval of the grant was almost one year.
  2. The length of time for the grant contract was an additional one-year.
  3. It took just over one year to locate a willing and acceptable turbine supplier.
  4. We also had challenges with DeWind and delays with tower suppliers. These delays caused additional challenges with weather and expenses in crane costs, lost production.
- **Turbine Availability**
  1. Less than one year after the project was submitted the federal tax credits for wind projects were re-activated. This made the availability of turbines nearly impossible for small projects with zero cooperation from vendors.
  2. October 2005 to January 2006 was spent trying to contact turbine suppliers all over the world with very poor cooperation.
- **Cost Increases**
  1. The cost of wind turbines doubled from beginning of 2004 to 2006.
  2. Because of increased costs, the financing had to be redesigned in several areas:

a. Using personal funds for expenses until Hilltop Land equity loan was on line.
b. Using equity from Hilltop Farm for operating capital in beginning phase. (per plan)
c. Obtaining Agstar loan on project. This became complicated because of the state of the economy over the last year and the tightening of credit. Because of this some of the (approx 100) loan requirements were:

    i. First interest in the wind project
    ii. Personal guarantee from Evan & Shea Johnson
    iii. Guarantee from Hilltop Farm

3. Set up "Hilltop Equity group" to add needed cash ($ 500,000) to the project and take advantage of Tax Credits. If Hilltop Equity Group was not allowed to use these credits this funding would not have been possible.

Technical Progress

- **Turbine Assembly: DeWind**

  Production of Hilltop Powers' DeWind D8.2 took place in the USA at the TECO Westinghouse facility in Round Rock, Texas. DeWind is leveraging TECO Westinghouse resources and experience in assembling large capital goods. The facility is fully ISO 9000 certified and allows DeWind to assemble turbines to exacting quality standards.

- **Design: DeWind D8.2 (60 Hz)**

  The DeWind D8.2 is a three-blade upwind turbine with pitch control and horizontal axis. Evolved from the D6 and D8 lines, it incorporates many lessons learned along with advanced new features. The turbine has a rated power of 2.0 MW. The outstanding features of the DeWind D8.2 are effective utilization of available wind, quiet operation, good grid compatibility and attractive design. The turbine operates with variable rotor speed and is thus capable of producing electric power efficiently at low wind speeds, and utilizing the energy of gusts without overloading the grid or turbine components. The directly connected synchronous generator with its inherent fault ride-through and other grid support capabilities, without reliance on power electronics, make it an attractive option for grid operators.

- **Power train: Voith Turbo Hydrodynamic gear box:**

  Voith sets standards in paper, energy, mobility and service markets. Founded on January 1, 1867, Voith has a current workforce of 37,000, sales of EUR 4 billion and over 270 locations worldwide. It is one of the largest family-owned enterprises in Europe.

  Today, one third of the world's paper production is carried out on machines made by Voith Paper. More than 30 percent of the electric energy generated worldwide from hydropower is produced with turbines and generators from Voith Siemens Hydro Power Generation. Voith Turbo drive components are found in industrial applications as well as

in road and rail vehicles and in ships in all countries of the world. Voith Industrial Services is one of the leading suppliers of technical services.

- **Turbine Blade Manufacturer: SINOI GmbH, Nordhausen, Germany**

  SINOI GmbH develops, manufactures, and supplies rotor blades and rotor blade molds for wind power plants. It offers pitch-adjustable rotor blades. The company also provides training and qualification programs for industrial employees in fiber-reinforced composites, as well as offers relevant apprenticeships and seminars. SINOI GmbH was formerly known as NOI Rotortechnik GmbH. The company was founded in 1999 and is based in Nordhausen, Germany. As of January 10, 2007, SINOI GmbH is a subsidiary of Lianyungang Zhongfu Lianzhong Composites Group Co., Ltd.

- **Tower: Katana Summit**

  KATANA Summit, LLC, a partnership of Sumitomo Corporation of Tokyo and KATANA Industries, Inc., of Ephrata, Washington, manufactured the tubular wind tower for Hilltop Power at the new Columbus, NE location. KATANA Industries operates a windmill tower manufacturing plant in Washington. Sumitomo Corporation, in existence for 400 years in Japan, operates a variety of ventures in several diverse industries including alternative energy, chemicals, construction, electronics, finance, media, metal products, mineral resources, real estate, and transportation.

Project Benefits

Minnesota labor was used in every possible application

Service	Company	Minnesota Workers
Road/Civil	Carstensen Contracting Pipestone, MN	10
Electrical	Olsen Electrical & Trenching Ihlen, MN	10
Mechanical Assembly	EMS (most employees live in Minnesota) Energy Maintenance Services South Dakota	15
Crane Crew	Truck Crane Service Eagan, MN	20
Electrical Engineering	CEG Farmington, MN	5
Foundation & Materials	SMI & Hydraulics Porter, MN	10
Concrete	Bornhoft Concrete Pipestone, MN	20

The above numbers are all estimates supplied by Jay Gilsason / President of DES (Diversified Energy) the General contractor on the project.

Trucking	Northern States Transportation Hutchinson, MN	10
	ATS St. Cloud, MN	10
Snow Plowing	Dave Hulstien Excavating Pipestone, MN	3
Consulting	S.W. Wind Consulting Pipestone, MN	2
Legal	Fryberger St. Paul/ Duluth	3
	Messerli & Kramer Minneapolis, MN	2
Accounting	Hoffman & Probst Marshall, MN	2
Financing	Agstar Mankato/ Glenco	4
Wind Study	Wind Logic St. Paul, MN	2

Help from professionals in their specific areas guided project. Contractors from each trade group abided by (OSHA) safety standards for their specific trade. There were no safety issues or injuries during the project. In all the Project supplied work for over 100 Minnesota workers of some degree.

Project Benefits

1. The obvious benefit of 2 MW of clean electrical power that is used on the local grid and doesn't have to be shipped on congested transfer lines out of the Pipestone area.
2. Given a launch customer for a new US manufacturer of Wind turbines. DeWind has also been selected for a project in Willmar Minnesota.
3. Spread knowledge and experience to Minnesota workers through the experience in this project.
4. Over $ 1,000,000 going to Minnesota workers.

5. Over 15 years approximately $40,000 from electrical sales to be donated to the Prairie Island Indian Community or some (to be named later if needed) Minnesota High School college scholarship program.

6. Demonstrated the concept of a cooperative using farmland equity for financing from Minneapolis area with the farm containing high wind resource in Western Minnesota.

Project Lessons Learned

1. Utilize the existing knowledge and experience in the wind industry by hiring experienced individuals.

2. Since the original proposal the economics of a single turbine project have become prohibitive unless grant money is involved. The soft costs, crane costs, and a lack of cooperation from most turbine vendors make these small projects nearly impossible.

3. The time lost during initial phases of the project (contracts, etc.) can have a significant effect on many different aspects of the project.

4. Major plan adjustments must sometimes be made to meet the original project goals and objectives.

Usefulness of Project Findings

These findings will be useful if the information is applied to future projects. If both sides (Xcel and future grant project managers) review the lessons learned, then adjustments can be made in the beginning phases that can help expedite and focus future projects.

Project funding (approx 33 % of total cost) was provided by customers of Xcel Energy through a grant from the Renewable Development Fund.

LEGAL NOTICE

Appendix:

A. Project Schedule

B. Project Costs

C. Project Photos

D. Generator Scada system

1. Turbine status (Real time Power vs. wind)
2. Power output tables (Per day)
3. Turbine availability values
4. Actual achieved power curve values

HILLTOP POWER LLC PROJECT SCHEDULE

	2004	2005												2006												2007												2008												2009	
		JAN	FEB	MAR	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	JAN	FEB	MAR	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	JAN	FEB	MAR	APRIL	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	JAN	FEB	MAR	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	JAN	FEB
Project Proposal Submitted	2/15																																																	
RDF FUNDING APPROVAL			2/3																																															
SITE EVALUATION																																																		
SITE DATA COLLECT						prelim	6/30							detailed	2/17																																					
CONNECT STUDY																																																		10/1				
CONTRACT AND AGREEMENTS																																																		
GRANT CONTRACT												11/10																																							
LLC SET UP				3/7																																															
LAND LEASE															3/9																																					
ADDITIONAL FINANCING (farm equity)																								11/14																												
ADDITIONAL FINANCING(project equity)																																																		10/8				
CONDITIONAL USE PERMIT																																																				
POWER PERCHASE AGMT.																																																				
INTERCONNECT AGREEMENT																																																			
MPUC APPROVAL OF PPA																																																			
DELIVERABLE #1																																																			
PROGRESS PAYMENT #1																																																			
TURBINE PURCHASE																																																			
DELIVERABLE #2																																																			
PROGRESS PAYMENT #2																																																			
SITE DESIGN & CONST. SPECS																																																		
CIVIL & ELECTRICAL DESIGN																																																		
CONSTRUCTION SPECS.																																																		
DELIVERABLE #3A																																																		
PROGRESS PAYMENT #3A																																																		
CONSTRUCTION																																																		
CONSTRUCTION CONTRACTS																																																		
INSURANCE PURCHASE																																																		
CIVIL																																																		
FOUNDATION WORK																																																		
DELIVERABLE #3B																																																		
PROGRESS PAYMENT #3B																																																		
INTERCONNECT / ELECTRICAL																																																		
TURBINE DELIVERY & INSTALL																																																		
DELIVERABLE 4																																																		
PROGRESS PAYMENT #4																																																		
ENERGY ON LINE/COMMISSIONING																																																		
DELIVERABLE #5																																																		
PROGRESS PAYMENT #5																																																		

HILLTOP POWER LLC PROJECTED AND FINAL PROJECT COSTS

2/25/2009	Additional Crane Costs Due to February Delay	Additional Crane Costs Due to February Delay	Additional Cost to Modify Turbine to Comply with New MN Requirements	Additional Crane Costs Due to 2nd Delay Until November 2008	ACTUAL COSTS or PAID TO DATE	YET TO PAY
Engineering	$30,000.00				$8,840.25	
Wind Study					$8,600.00	
Permitting/Fees	$1,100.00				$671.00	
Lease					$10,740.00	
Xcel Revenue Meter, CT's & PT's	$74,500.00				$88,172.60	
Phone					$2,360.06	
Legal and Accounting Fees	$11,000.00				$44,430.07	
Accounting					$2,116.00	
Mortgage Fees	$3,000.00				$15,317.58	
Insurance					$10,468.14	
Transportation Costs	$136,350.00				$111,222.75	
Construction Period Interest	$15,000.00				$25,011.24	
Development Fee	$50,000.00				$54,528.25	
Foundations	$135,870.00				$135,870.00	
Cranes, Rigging, Labor	$325,500.00	$282,328.00		$228,000.00	$835,828.00	
Transformers	$55,000.00		$75,000.00		$59,000.00	$100,000.00
Xcel Scada						$54,000.00
Access Roads	$57,600.00				$57,600.00	
FAA Lighting	$3,500.00				$3,500.00	
Electrical	$151,850.00				$151,850.00	
Contingency	$90,580.00				$0.00	
Turbine and Tower	$2,400,000.00	-$82,000.00		-$228,000.00	$1,610,000.00	$480,000.00
Totals	**$3,540,850.00**	**$200,328.00**	**$75,000.00**	**$0.00**	**$3,236,125.94**	**$634,000.00**

TOTAL PROJECT COST = $3,870,125.94

HILLTOP POWER LLC PROJECT PHOTOS

A late delivery of the tower delay assembly and erection of the tower into November. This resulted in several delays due to poor winter weather conditions that prevented the use of the large cranes.

Hilltop obtained a long-term lease for the project site. Which includes sufficient space for two additional turbines in the future. The site is within a mile from the point of interconnection with a 21.5 kV line.

The turbine used is a 2.0 MW DeWind D8.2 three-blade, upwind turbine with pitch control and horizontal axis. The turbine operates with variable rotor speed and is capable of producing electric power at low wind speeds. The cut in wind speed is 3 m/s with a nominal wind speed of 13.5 m/s.

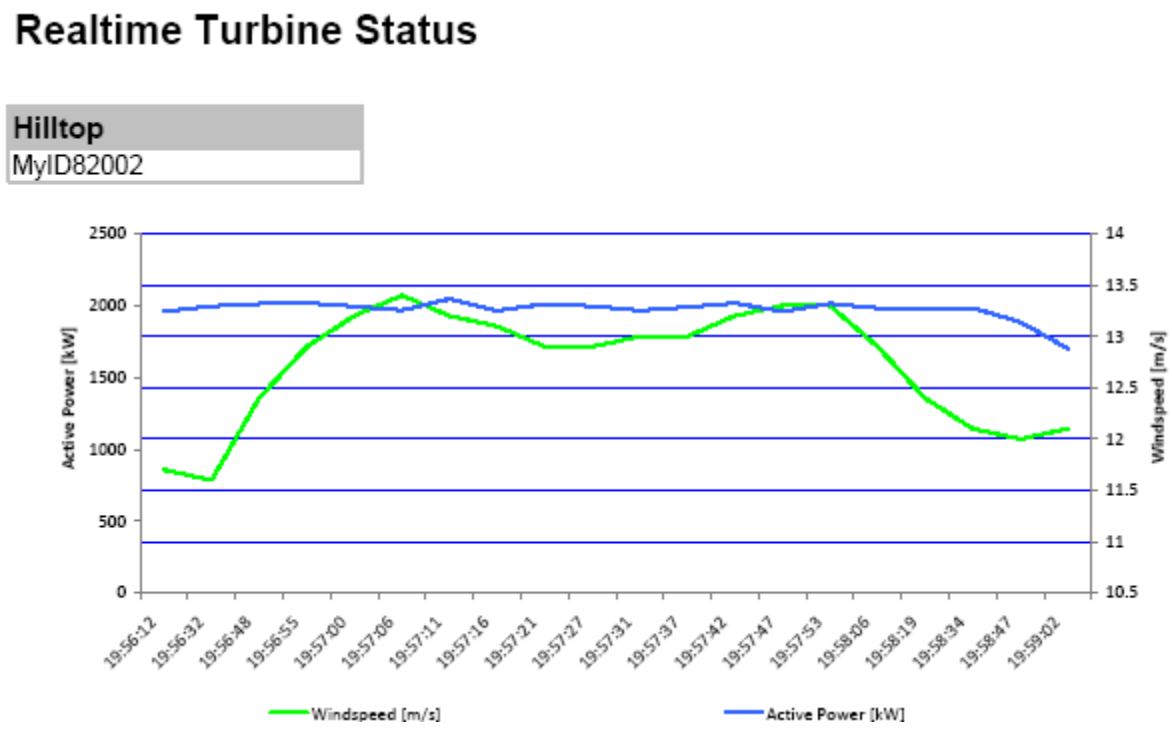
Because of bad weather and road salts the tower sections need to be cleaned with a high-pressure washer prior to installation to prevent corrosion. DSL service was installed to the site for monitoring and control. Second and third tower sections are assembled and the blades were mounted to the hub before weather and wind conditions prevented the crew from further construction activities.

On November 17, 2008 the wind conditions were too strong to assemble the turbine until 4:00 in the afternoon. After 4:00 p.m. the winds allowed resuming assembly and all major components were in place by midnight.

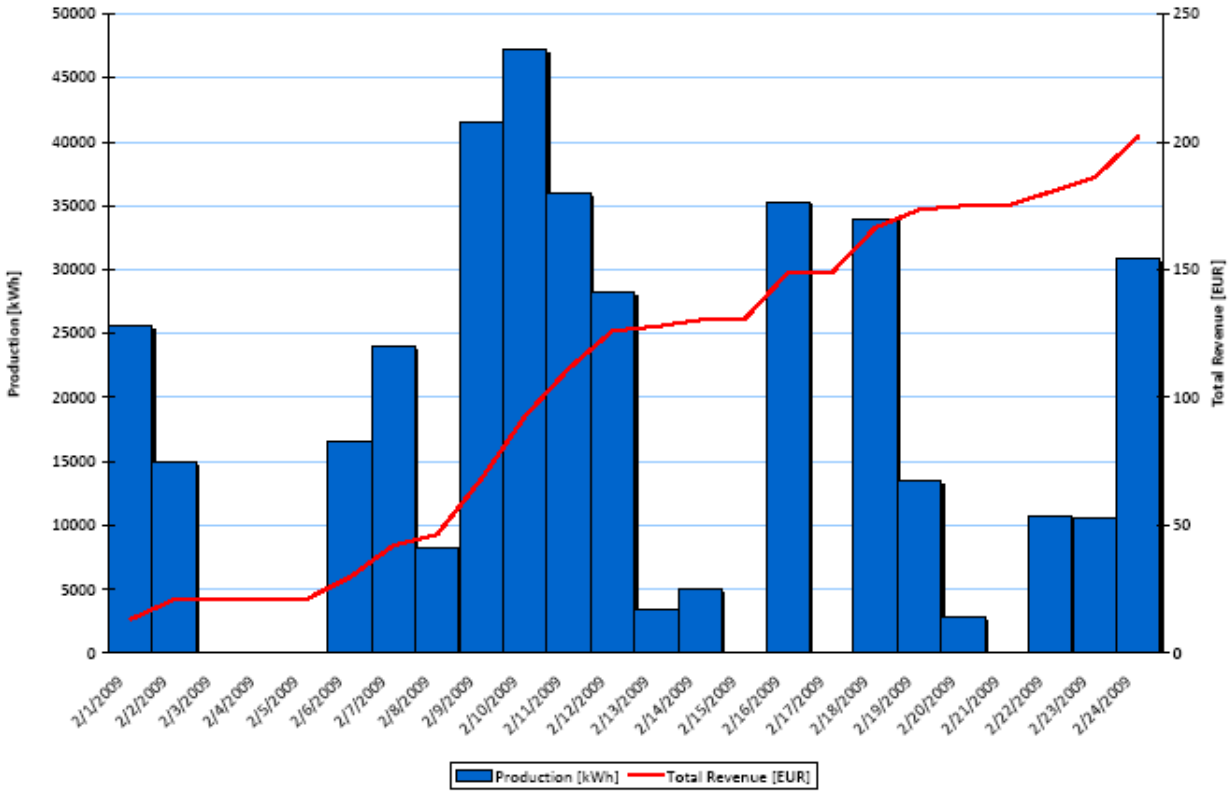
On February 20, 2009 Dewind issued the commissioning certificate. The turbine is commercially on line with Xcel Energy.

GENERATOR SCADA SYSTEM

Turbine Status (Real time Power vs. wind)



Power Output Tables (Per day)

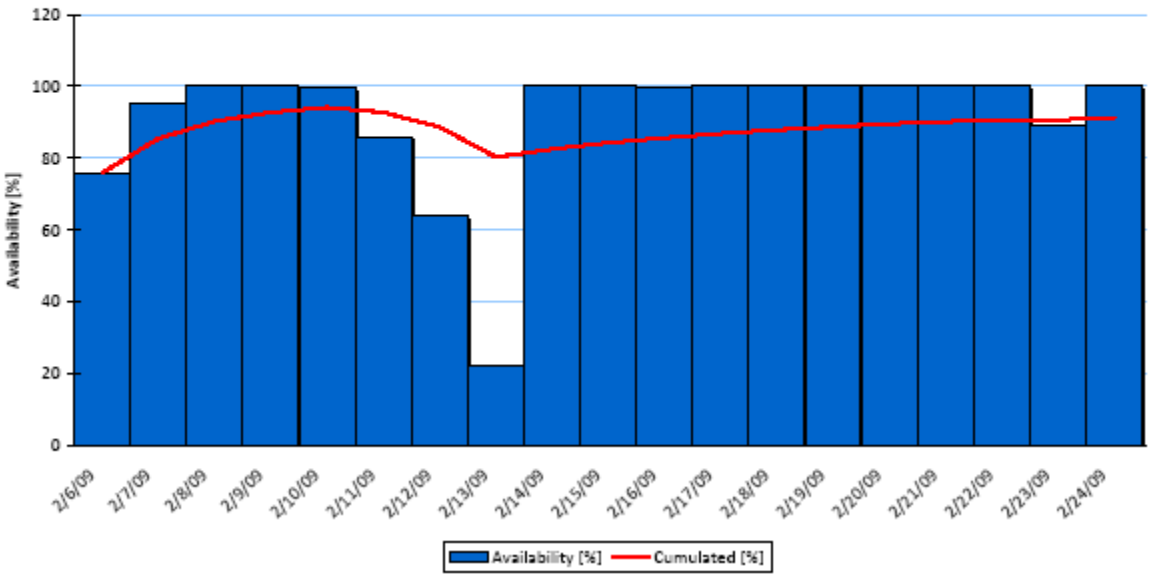


Turbine Availability Values

Availability

Hilltop	
MyID82002	
Start date	6/2/2009
End date	2/24/2009

Average availability 91.14%



Actual Achieved Power Curve Values

Performance Curve

Hilltop	
MyID82002	
Start date	2/9/2009
End date	2/18/2009