

PrairieWinds ND1 (PWND1) Emissions Reduction Project

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Project Title	PrairieWinds ND1 (PWND1) Emissions Reduction Project
Version	2
Date of Issue	20 March 2013
Project ID	740
Monitoring Period	01 January 2012 – 31 December 2012
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1 PROJECT DETAILS

1.1 Summary Description of Project

PrairieWinds ND 1, Inc. (PWND1) is a North Dakota corporation that owns a grid connected wind project located near Minot, North Dakota. The project began operations December 30, 2009, and at the time of its commissioning, was the largest project operated by an electric power cooperative in the United States. The project uses 77 1.5 megawatt turbines and delivers power into the Western Area Power Administration (WAPA's) Upper Great Plains East (UPGE) Integrated System, which is part of the Midwest Reliability Organization (MRO) region as established by the North American Electric Reliability Commission (NERC).

The project is 100% owned by PWND1, a wholly-owned subsidiary of Basin Electric Power Cooperative (BEPC or Basin). The project is operated by BEPC pursuant to a Construction, Operations and Management Agreement between BEPC and PWND1. The project generates emissions reductions by displacing grid connected electricity.

BEPC developed this project on a voluntary basis and it was not required to meet any state renewable portfolio requirements. In addition, the monetization of the green attributes from this project was part of the justification of the economics of the project to BEPC as they have more cost effective alternatives to obtain energy from grid connected resources, absent the value of the green attributes.

1.2 Sectoral Scope and Project Type

As a grid-connected renewable energy project, the project activity may be principally categorized under Sectoral Scope Number 1: Energy industries (renewable/non-renewable sources).

PWND1 is a stand-alone project, and is not a grouped project.

1.3 Project Proponent

The project proponent for this project is BEPC. BEPC is a not-for-profit, wholesale electric generation and transmission cooperative based in North Dakota that provides electricity to 2.8 million customers across 135 rural distribution companies in 9 states (MT, MN, IA, SD, ND, CO, NM, NB, WY). BEPC's charter is to provide low cost, reliable electric power to its members.

BEPC incorporated PWND1 as a wholly-owned subsidiary to develop this project. Although PWND1 is the owner of the wind project, it has delegated operating control to its parent, BEPC, pursuant to a Construction, Operations & Management Agreement. Therefore, we list BEPC as the project proponent as opposed to PWND1. Please note that two projects are part of the PWND1 subsidiary – this 115.5 MW wind project developed in December 2009 and a smaller 4.5 MW site near Minot, ND. The project under consideration for VCS validation is the 115.5 MW project only.

Contact information for BEPC is:

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1.4 Other Entities Involved in the Project

Element Markets LLC, is a renewable energy development and environmental credit marketing company based in Houston, Texas. Element Markets is the consultant and authorized representative for BEPC and is undertaking the verification and validation of the VCS project on behalf of BEPC.

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1.5 Project Start Date

The in-service date of the project is December 30, 2009.

1.6 Project Crediting Period

The project crediting period for the projects will commence January 1, 2011, and conclude December 31, 2020, for a total of 10 years. This verification covers the periods from January 1, 2012– December 31, 2012.

1.7 Project Location

PWND1 is located south of Minot, spanning 30,000 acres in Ward County at coordinates: Latitude: 47.9° Longitude: -101.3°.



Figure 1: Large-Scale Image of Project



Figure 2: Small-Scale Image of Project



1.8 Title and Reference of Methodology

Title: ACM0002 - Consolidated baseline methodology for grid-connected electricity generation from renewable sources

Reference:

<http://cdm.unfccc.int/filestorage/V/A/1/VA17EM2PNDJWBTFY34KGRLZO68S9UQ/Consolidated%20baseline%20methodology%20for%20grid-connected%20electricity%20generation%20from%20renewable%20sources.pdf?t=NXV8bHVwdzh6fDAPIdA2Htix3vUsiCteQTKR>

Version: Version 12.1.0

2 IMPLEMENTATION STATUS

2.1 Implementation Status of the Project Activity

PrairieWinds ND1 came online on December 30, 2009 and has experienced normal operations since then, until the period ending December 31st, 2012.

Western Area Power Administration occasionally requests facilities to derate or shutdown in order to check the over-supply of power into the grid. In order to comply with this request, the PrairieWinds facility had to change the output capacities a few times during the year 2012 which led to lower power generation during those months. Other than these curtailments, no other unscheduled outages or events took place and the project operated normally.

The JEMStar meter measures the amount of power generated on a continuous basis; data is aggregated hourly and is reported in a MV90 report with 8760 separate data points based on the kWh generated each hour. The Western Area Power Administration (WAPA) reads this meter on a monthly basis and reports the number of megawatt hours (MWh) generated to the Midwest Renewable Energy Tracking System (MRETS), which then issues Renewable Energy Credits (RECs) to the project's account. As noted in the project description, the project's registration in MRETS is being used for reporting purposes only – all certificates for which VCUs are being generated will be retired and screenshots are being provided to the verifiers to ensure no double counting can take place.

Per the project description, both the MV90 data and the corresponding MRETS generation records are being provided to corroborate the number of MWh generated. Please note that at times, there can be a small difference between the value reported in the MV90 report and the value in MRETS. For the period between January 1 – December 31, 2012, the average difference between the MRETS value and the MV90 value is extremely small - 0.0012%.

The small difference between the MV90 data and M-RETS occurs due to the way WAPA reads the meters for the projects. WAPA's standard procedure is to use the Stop meter reading and subtract the Start meter reading to come up with the monthly reading. This reading is then multiplied by the meter's multiplier to come up with monthly kWh. The Start and Stop times occur at midnight of the beginning of each month.

The MV90 hourly data is a reading for each hour multiplied by the meter multiplier. Therefore when summing up the hourly meter reads and comparing to a start and stop time meter read a variance will occur to sampling.

The project generated a total of 436,699.00 MWh in the period from January 1 – December 31, 2012. However, only a portion of the totals MWhs generated will be utilized for generating carbon credits, and only those RECs associated with that portion will be retired. The remaining RECs associated with the unutilized portion of MWhs will not be retired.

2.2 Project Description Deviations

As documented in the project description, the PWND1 has a revenue grade meter (JEMStar, Serial No. 2009093450, Model No. SEL 734) installed at the Nelson Tap Substation point. The meter test for PWND1 was conducted in late 2009 (12/22/09), and the meter has continued to operate within limits.

As per the WAPA guidelines, another meter test was due within 3 years, or before 12/22/2012, however, the meter was tested on 2/20/2013, which is 2 months after the suggested time period. The meter test schedule was delayed by 2 months due to shift in priorities and resources for completing other, more urgent, infrastructural development projects being carried out by the Basin Co-operative.

Further, the delay in meter test did not negatively affect the emission calculations as is shown by the results in the meter test completed on 2/20/2013. The results show that the meter is operating within the original set limits and has developed no deviations since the last test was conducted. Additionally, an attestation for 2012 is provided stating that no meter calibrations were conducted during CY2012.

2.3 Grouped Project

PWND1 is a stand-alone project, and is not a grouped project

3 DATA AND PARAMETERS

3.1 Data and Parameters Available at Validation

Data Unit / Parameter:	$EF_{\text{grid,CM,y}}$
Data unit:	Metric tons / MWhr
Description:	The CO ₂ emissions factor for the grid displaced due to the project activity, during the year y in metric tons CO ₂ /MWh, as calculated by the combined operating margin (CM), which is a weighted average of the Simple Operating Margin and Build Margin.

Source of data:	Calculated based on Tool for calculating emissions intensity of the grid; Sources include EIA 923/860 databases, EIA fuel emissions factors
Value applied:	0.8422
Purpose of Data	Used to calculate the metric tons displaced when 1 MWhr of renewable power is placed on the grid
Any comment:	The ex-ante option is chosen

Data Unit / Parameter:	$EF_{grid,OMsimple,y}$
Data unit:	Metric tons / MWh
Description:	Simple Operating Margin CO2 emissions factor in year y
Source of data:	Calculated based on Tool for calculating emissions intensity of the grid; Sources include EIA 923/860 databases, EIA fuel emissions factors
Value applied:	0.98542
Purpose of Data	Used to determine the simple operating margin. The combined intensity is a weighted average of the simple operating margin and the build margin
Any comment:	The ex-ante option is chosen

Data Unit / Parameter:	$EG_{m,y}$
Data unit:	MWh
Description:	Net quantity of electricity generated by power unit m in year y (m includes all power units except low cost must run power units)
Source of data:	EIA 923/860 databases
Value applied:	Varies by unit
Purpose of Data:	Used to calculate the simple operating margin
Any comment:	N/A

Data Unit / Parameter:	For simple operating margin - $EF_{EL,m,y}$
Data unit:	Metric tons / MWh
Description:	CO2 emissions factor of power unit m in year y (tCO2 / MWh)
Source of data:	EIA 923/860 databases

Value applied:	Varies by unit
Purpose of Data	Used to calculate the simple operating margin
Any comment:	N/A

Data Unit / Parameter:	$FC_{i,m,y}$ and $NCV_{i,y}$
Data unit:	MMBtus
Description:	Amount of fossil fuel type i consumed by power unit m in year y (mass or unit volume) and the Net Calorific Value (energy content) of fossil fuel type i in year y
Source of data:	EIA 923/860 databases and EIA Fuel Emissions Factors
Value applied:	Varies by unit
Purpose of Data	Used to calculate the simple operating margin
Any comment:	N/A

Data Unit / Parameter:	$EF_{CO_2,i,y}$
Data unit:	Kg CO ₂ e/MMBtu
Description:	CO ₂ emissions factor of fossil fuel type i in year y
Source of data:	EIA 923/860 databases and EIA Fuel Emissions Factors
Value applied:	Varies by fuel type
Purpose of Data	EIA fuel emissions factors are default values that have been used to prepare GHG inventories. These values are used to calculate the operating margins.
Any comment:	N/A

Data Unit / Parameter:	$EF_{grid,BM,y}$
Data unit:	Metric Tons / MWh
Description:	CO ₂ emissions factor of fossil fuel type i in year y
Source of data:	Calculated using Option A2 for simple OM, but including all units as defined in the methodology. EIA 923/860 databases and EIA Fuel Emissions Factors
Value applied:	0.4126
Purpose of Data	This factor is the build margin. The combined margin is a weighted average of the build and operating margin.
Any comment:	N/A

Data Unit / Parameter:	For Build Margin - $EF_{EL,m,y}$
Data unit:	Metric tons / MWh
Description:	CO2 emissions factor of power unit m in year y (tCO2 / MWh)
Source of data:	EIA 923/860 databases
Value applied:	Varies by unit
Purpose of Data	Used to calculate the build margin factor. Calculated using EIA 923 / EIA 860 databases and EIA Fuel emissions factors, based on Option A2 as described under the Simple OM.
Any comment:	This factor uses the power generation efficiency factor and the CO2 emissions factor of fossil fuel type I in year y.

Data Unit / Parameter:	For Build Margin - $n_{m,y}$
Data unit:	MMBtus / MWh
Description:	Average net energy conversion efficiency of power unit m in year y
Source of data:	Default table, Annex 1
Value applied:	Varies by unit
Purpose of Data	Used to calculate the build margin factor. This is required by the Tool for the option chosen.
Any comment:	N/A

3.2 Data and Parameters Monitored

Data Unit / Parameter:	$EG_{facility,y}$
Data unit:	MWh/yr
Description:	Quantity of net electricity generation supplied by the project plant/unit to the grid in year y (MWh/yr)
Source of data:	Project activity revenue meter at the site (JemStar Meter)
Description of measurement methods and procedures to be applied:	Revenue grade meters record power generated on a continuous basis.

	Production is then aggregated at an hourly interval so that an 8760 hourly production shape is available for each year. Data monitoring takes place on a monthly basis, when WAPA reads the meters and submits data to the Midwest Renewable Energy Tracking System (MRETS). This monthly data from MRETS is what will be used to calculate the emissions reductions.
Frequency of monitoring/recording:	Data Recording: Continuous Data Aggregation: Hourly Data Monitoring: Monthly
Value monitored:	$EG_{\text{facility},y} = 436,699.00 \text{ MWh}$ The portion of total MWhs utilized for generating carbon credits = 411,079.00 MWh
Monitoring equipment:	The project operator installed a JemStar revenue grade meter (Serial No. 2009093450, Model No. SEL 734). The meter was tested on 2/20/2013. An attestation for 2012 is provided stating that no meter calibrations were conducted during CY 2012.
QA/QC procedures to be applied:	Per the interconnection agreement and WAPA Metering Guidelines, this meter was tested on 2/20/2013. An attestation for 2012 is provided stating that no meter calibrations were conducted during CY 2012.
Calculation method:	Meter readings
Any comment:	N/A

Description of the Monitoring Plan

- Data Monitoring
 - o A JEMStar Revenue grade meters record power generated on a continuous basis.
 - o Production is then aggregated at an hourly interval so that an 8,760 hourly production shape is available for each year.
 - o Data monitoring takes place on a monthly basis when WAPA reads the meters and submits data to the Midwest Renewable Energy Tracking System (M-RETS).
 - o This monthly data from M-RETS is what will be used to calculate the emissions reductions.

- o Monitoring records will be retained for 12 years (two years past the project's crediting period of 10 years).
- Metering Devices:
 - o A JemStar revenue grade meter (Serial No. 2009093450, Model No. SEL 734) generates the MV90 data; the meter is read by WAPA.
 - o Based on the Interconnection Agreement between PWND1 and WAPA, WAPA is responsible for installing and calibrating the meter at the project site. Most meter calibrations take place every three to seven years. Since the project's online date is December 30, 2009, no calibration activities took place this year. Additionally, an attestation for 2012 is provided stating that no meter calibrations were conducted during CY 2012.
 - o As per the WAPA guidelines, another meter test was due within 3 years, or before 12/22/2012, however, the meter was tested on 2/20/2013, which is 2 months after the suggested time period. The meter test schedule was delayed by 2 months due to shift in priorities and resources for completing other, more urgent, infrastructural development projects being carried out by the Basin Co-operative.
 - o Further, the delay in meter test did not negatively affect the emission calculations as is shown by the results in the meter test completed on 2/20/2013. The results show that the meter is operating within the original set limits and has developed no deviations since the last test was conducted.
 - o Extraordinary Events: No extraordinary events or unscheduled maintenance took place.
- Retirement of RECs
 - o As stated in the project description, since this project is registered in MRETS, renewable energy credits are being created for each MWhr generated. These credits have been retired.
 - o In addition, Basin has provided an attestation that these credits are not being used in any other GHG program.

4 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

4.1 Baseline Emissions

The total MWh generated (as reported in MRETS) for the period between January 1, 2012 – December 31, 2012 are: 436,699.00 MWh. However, since only 411,079.00 MWh are used for generating carbon credits, we use this value for calculating baseline emission reductions.

The Baseline Emissions are calculated by multiplying the MWh utilized, by the combined margin (EF_{grid,CM,y}), which is 0.8422 metric tons CO_{2e} / MWh.

Hence the Baseline Emissions are:

411,079.00 MWh * 0.8422 metric tons / MWh = 346,210.73 metric tons.

4.2 Project Emissions

Per the methodology ACM0002, project emissions from this project are zero. Per the methodology, we do not consider project emissions because this is not a geothermal, solar thermal, or hydro project.

4.3 Leakage

Per ACM0002, no leakage is considered.

4.4 Summary of GHG Emission Reductions and Removals

$$ER_y = BE_y - PE_y.$$

Here, $ER_y = 346,210.73 - 0 = 346,210.73$ metric tons.

5 ADDITIONAL INFORMATION

None