

PRAIRIEWINDS ND1 (PWND1) EMISSIONS REDUCTION PROJECT



ELEMENT MARKETS

Document Prepared By

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1 PROJECT DETAILS

1.1 Summary Description of the Implementation Status of the Project

PrairieWinds ND 1, Inc. (PWND1) is a North Dakota corporation that owns a grid connected wind project located near Minot, North Dakota. Construction of the project started on August 14, 2009. The project began operations December 30, 2009 and has been in continuous operation to date. At the time of its commissioning, the project 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 and is not an USAID AFOLU project.

The project achieved total net GHG emission reductions of 351,919 tCO₂e in the period from January 1 – December 31, 2013.

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 (renewable/non-renewable sources). PWND1 is a stand-alone project, and is not a grouped project.

1.3 Project Proponent

Organization name	Basin Electric Power Cooperative (parent company of PrairieWinds ND 1, Inc.)
Contact person	Zane Zuther
Title	Planning Analyst
Address	1717 East Interstate Avenue Bismarck, North Dakota 58503-0564
Telephone	701-557-5638
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Organization name	Basin Electric Power Cooperative (parent company of PrairieWinds ND 1, Inc.)
Contact person	Jason Doerr
Title	Sr. Marketing Engineer, Marketing & Power Supply Planning Division
Address	1717 East Interstate Avenue Bismarck, North Dakota 58503-0564
Telephone	701-557-5388
Email	jdoerr@bepc.com

Organization name	Basin Electric Power Cooperative (parent company of PrairieWinds ND 1, Inc.)
Contact person	David Raatz
Title	Manager of Marketing and Power Supply
Address	1717 East Interstate Avenue Bismarck, North Dakota 58503-0564
Telephone	701-223-0441
Email	draatz@bepc.com

1.4 Other Entities Involved in the Project

Organization name	Element Markets, LLC
Role in the project	Consultant and authorized representative for BEPC
Contact person	Ken Nelson
Title	Senior Vice President
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Telephone	281-207-7208
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Organization name	Element Markets, LLC
Role in the project	Consultant and authorized representative for BEPC
Contact person	Mihaly Wekler
Title	Project Manager
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Telephone	281 886 0887
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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 started January 1, 2011, and will conclude on December 31, 2020 - a total of 10 years. This verification covers the periods from January 1, 2013– December 31, 2013.

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 Map of Project location



Figure 2 Small-Scale Map of Project



Figure 3 Images of Project

1.8 Title and Reference of Methodology

1.8.1 Title

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

1.8.2 Reference

<http://cdm.unfccc.int/filestorage/V/A/1/VA17EM2PNDJWBTFY34KGRLO68S9UQ/Consolidated%20baseline%20methodology%20for%20grid-connected%20electricity%20generation%20from%20renewable%20sources.pdf?t=NXV8bHVwdzh6fDAPldA2Htix3vUsCteQTKR>

1.8.3 Version

Version 12.1.0

1.8.4 Tools used

- Tool for the demonstration and assessment of additionality - version 5.2
- Tool to calculate the emission factor for an electricity system - version 2.2.0

1.9 Other Programs

PWND1 is currently listed in MRETS (the Midwest Renewable Energy Tracking System.) A third party, (WAPA) reports the number of MWHrs generated each month to MRETS, which will assign unique serial numbers for each MWHr. For the creation of VCUs, the MWHrs for which VCUs are being claimed will be retired in the system and the reason for doing this (VCU creation) will be documented in the system. The retirement of these credits and subsequent identification of the reason will ensure that those RECs will not be double sold, and that VCUs can be created with confidence.

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.

PWND1 project has neither applied for nor been denied acceptance under any other GHG program.

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 end of the current period - December 31st, 2013.

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 2013 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.

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, 2013, the difference between the annual MRETS value and the MV90 value is extremely small 0.001%.

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.

2.2 Deviations

2.2.1 Methodology Deviations

No methodology deviations were applied during this monitoring period.

No methodology deviations were applied during previous reporting periods

2.2.2 Project Description Deviations

No project description deviations were applied during this monitoring period.

2.2.3 Project description deviations applied during monitoring period of 1/1/2012 to 12/31/2012

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.

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 / Parameter	$EF_{grid,CM,y}$
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
Justification of choice of data or description of measurement methods and procedures applied	$w1 * \text{Simple OM} + w2 * \text{Build Margin}$, where $w1 = 0.75$, $w2 = 0.25$, Simple OM = 0.98542 and Build Margin = 0.4126. For detailed calculations see Section 3 of the Project Description .
Purpose of the data	Calculation of baseline emissions
Comments	The ex-ante option is chosen

Data Unit / Parameter:	$EF_{grid,OMsimple,y}$
Data unit:	Metric tons / MWh
Description:	Simple Operating Margin CO ₂ 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
Justification of choice of data or description of measurement methods and procedures applied	Calculated based in tool for calculating emissions intensity of the grid. For detailed calculations see Section 3 of the Project Description .
Purpose of Data	Calculation of baseline emissions
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
Justification of choice of data or description of measurement methods and procedures applied	N/A
Purpose of Data:	Calculation of baseline emissions
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
Justification of choice of data or description of measurement methods and procedures applied	Calculated using EIA 923 / EIA 860 databases and EIA Fuel emissions factors
Purpose of Data	Calculation of baseline emissions
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
Justification of choice of data or description of measurement methods and procedures applied	The EIA 923 database provides the product of these two factors and provides the MMBtus consumed for electricity generation for each plant in the grid.
Purpose of Data	Calculation of baseline emissions
Any comment:	N/A

Data Unit / Parameter:	$EF_{CO2,i,y}$
Data unit:	Kg CO2e/MMBtu
Description:	CO2 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
Justification of choice of data or description of measurement methods and procedures applied	EIA fuel emissions factors are default values that have been used to prepare GHG inventories.
Purpose of Data	Calculation of baseline emissions
Any comment:	N/A

Data Unit / Parameter:	$EF_{grid,BM,y}$
Data unit:	Metric Tons / MWh
Description:	CO2 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
Justification of choice of data or description of	For detailed calculations see Section 3 of the Project Description

measurement methods and procedures applied	
Purpose of Data	Calculation of baseline emissions
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
Justification of choice of data or description of measurement methods and procedures applied	Calculated using EIA 923 / EIA 860 databases and EIA Fuel emissions factors, based on Option A2 as described under the Simple OM found in Section 3 of the Project Description .
Purpose of Data	Calculation of baseline emissions
Any comment:	This factor uses the power generation efficiency factor and the CO2 emissions factor of fossil fuel type l 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
Justification of choice of data or description of measurement methods and procedures applied	This is required by the Tool for the option chosen.
Purpose of Data	Calculation of baseline emissions
Any comment:	N/A

3.2 Data and Parameters Monitored

Data / Parameter	EG _{facility,2013}
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 _{facility,2013} = 417,857 MWh
Monitoring equipment	The project operator installed a JemStar revenue grade meter (Serial No. 2009093450, Model No. SEL 734).
QA/QC procedures to be applied	Per the interconnection agreement and WAPA Metering Guidelines, this meter was tested on 2/20/2013.
Purpose of the data	Calculation of baseline emissions
Calculation method	Meter readings
Comments	N/A

3.3 Monitoring Plan

3.3.1 Relationship of the parties involved

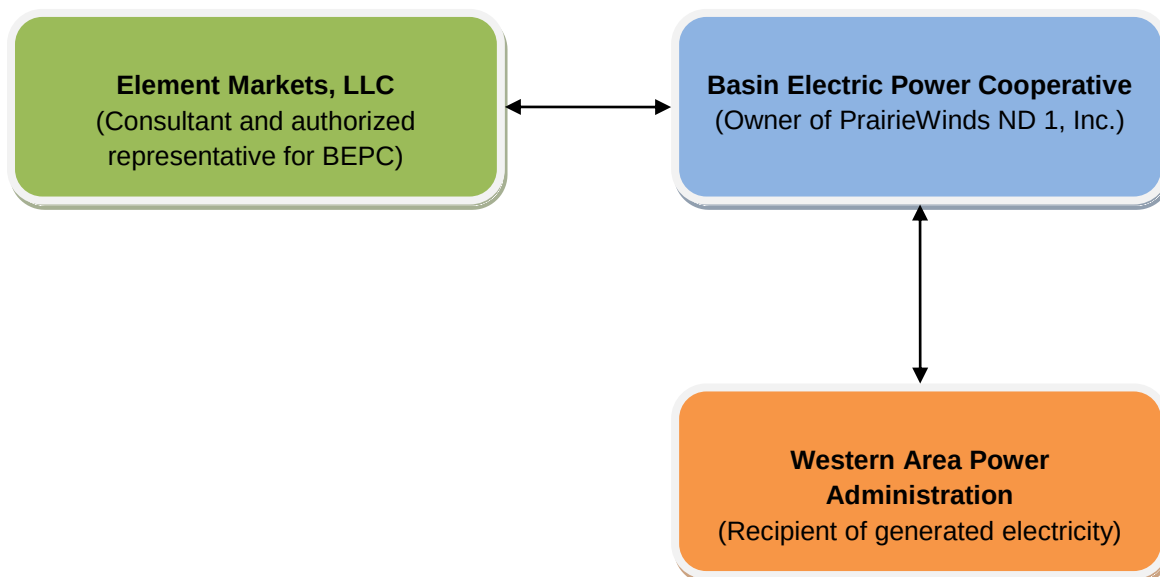


Figure 4 Relationship of parties involved in the project

Basin Electric Power Cooperative: Owner and operator of the project through its wholly owned subsidiary - PrairieWinds ND 1, Inc.

Western Area Power Administration: Recipient of all electricity generated by the project. As per the Interconnection Agreement between PWND1 and WAPA, WAPA is responsible for installing and calibrating the meter at the project site. WAPA is taking monthly readings and reporting electricity generation in MRETS.

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

For contact information of the parties involved in the project, see section 1.4 Other Entities Involved in the Project.

3.3.2 Data Monitoring

- A JEMStar Revenue grade meters record power generated on a continuous basis.
- Production is then aggregated at an hourly interval so that an 8,760 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 (M-RETS).

- This monthly data from M-RETS is what will be used to calculate the emissions reductions.
- Monitoring records will be retained for 12 years (two years past the project's crediting period of 10 years).

3.3.3 Metering Devices

- A JemStar revenue grade meter (Serial No. 2009093450, Model No. SEL 734) generates the MV90 data; the meter is read by WAPA.
- The most recent meter test was performed on 2/20/2013. Meter calibrations take place every three years. Accordingly, no additional calibration activities took place this year.

3.3.4 Extraordinary Events:

No extraordinary events or unscheduled maintenance took place.

3.3.5 Retirement of RECs:

- 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.
- In addition, Basin has provided an attestation that these credits are not being used in any other GHG program.

3.3.6 Internal audit and handling of non-conformities

- All data used for establishing and verifying GHG emission reductions and removals is collected and processed by Element Markets with the help of other project proponents.
- Data collection and processing is based on EM's internal QA/QC procedures which include preapproved data and documentation checklists as well as emission reduction calculation methodology.
- All verification data submittal is performed under the supervision of EM's senior management. Any errors or non-conformities discovered during internal audits or by third party verifiers are addressed in cooperation with the project proponents by EM's operations team.
- The final step of non-conformance resolution is review and (if needed) update of the appropriate sections of the QA/QC procedures.

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, 2013 – December 31, 2013 are: 417,857 MWh.

The Baseline Emissions are calculated by multiplying the MWh utilized, by the combined margin (EFgrid,CM,y), which is 0.8422 metric tons CO₂e / MWh.

Hence the Baseline Emissions are:

417,857 MWh * 0.8422 metric tons / MWh = 351,919 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 Net GHG Emission Reductions and Removals

Year	Baseline emissions or removals (tCO ₂ e)	Project emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Net GHG emission reductions or removals (tCO ₂ e)
2013	351,919	-	-	351,919
Total	351,919	-	-	351,919