



**Verified Carbon
Standard**

PRAIRIEWINDS ND1 (PWND1) EMISSIONS REDUCTION PROJECT



Blue Delta Energy

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”), a wholly owned subsidiary of Basin Electric Power Cooperative (“BEPC”), was a North Dakota corporation that developed and owned a grid connected wind project located near Minot, North Dakota (the “Project”). The Project began operations December 30, 2009, and at the time of its commissioning, was the largest wind project developed, owned and operated by an electric power cooperative in the United States. Effective December 31, 2017, PWND1 was merged into BEPC with the result being the Project is now owned directly by BEPC.

The Project consists of 77 1.5 megawatt turbines and delivers power into the Midwest Reliability Organization (MRO) region as established by the North American Electric Reliability Commission (NERC). The project generates emissions reductions by displacing grid connected electricity.

BEPC/PWND1 developed the Project on a voluntary basis and was not and is still not required to meet any state or federal renewable portfolio requirements. In addition, the monetization of the green attributes from this project was part of the economic justification of the Project to BEPC as at the time when the decision was made to proceed, as there were more cost-effective alternatives to obtain energy from grid connected resources, absent the value of the green attributes.

The Project achieved total net GHG emission reductions of 124,186 tCO₂e in the Monitoring Period (January 1, 2021 – December 31, 2021).

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). The Project is a stand-alone project and is not a grouped project.

1.3 Project Proponent

Organization name	Basin Electric Power Cooperative
Contact person	Rebecca A. Kern
Title	Vice President – Resource Planning & Rates
Address	1717 East Interstate Avenue Bismarck, North Dakota 58503-0564
Telephone	(701) 557-5752
Email	bkern@bepc.com

Organization name	Basin Electric Power Cooperative
Contact person	Zane Zuther
Title	Utility Planning Analyst
Address	1717 East Interstate Avenue Bismarck, North Dakota 58503-0564
Telephone	(701) 557-5638
Email	zzzuther@bepc.com

1.4 Other Entities Involved in the Project

Organization name	Blue Delta Energy, LLC
Role in the Project	Consultant and authorized representative for BEPC
Contact person	Kenneth Nelson
Title	President
Address	458 Grand Avenue, Suite 201 New Haven, Connecticut 06513
Telephone	(475) 441-7939
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1.5 Project Start Date

The commercial operation date of the project is December 30, 2009.

1.6 Project Crediting Period

The Initial Crediting Period for the Project started on January 1, 2011, and concluded on December 31, 2020, for a total of 10 years. The Project has applied for a second crediting period in conjunction with this verification. The period covered by this verification is from January 1, 2021 – December 31, 2021.

1.7 Project Location

Prairiewinds ND1 is located south of Minot, spanning 30,000 acres in Ward County at coordinates Latitude: 47.9° Longitude: -101.39°





Figure 3 Image of Project

1.8 Title and Reference of Methodology

Title

ACM0002 – “Grid-connected electricity generation from renewable sources”

Reference

<http://cdm.unfccc.int/methodologies/DB/XP2LKUSA61DKUQC0PIWPGWDN8ED5PG>

Version

Version 20.0

Tools used

- TOOL07 – “Tool to calculate the emission factor for an electricity system” (Version 7.0)
- TOOL11 – “Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period” (Version 3.0.1).

1.9 Participation under other GHG Programs

The Project is not registered under any other GHG Programs or any Environmental Credit program other than those detailed in Section 1.10.2.

1.10 Other Forms of Credit

1.10.1 Emission Trading Programs and Other Binding Limits

The Project and its operations/activities are not currently covered under any Emission Trading Programs or subject to any other mechanism that includes GHG allowance trading.

1.10.2 Other Forms of Environmental Credit

The Project site is currently listed in M-RETS (the Midwest Renewable Energy Tracking System), a third-party registry created to record the generation of renewable energy MWhs and renewable energy credits (RECs). BEPC has a Qualified Reporting Entity (QRE) group that reports the number of MWhs generated each month to M-RETS, which in turn assigns unique serial numbers for each MWh. For the creation of VCUs, the MWhs for which VCUs are being claimed will be retired in M-RETS and the reason for doing this (VCU creation) will be documented in M-RETS. 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.

The RECs generated by the Project are eligible under the Center for Resource Solutions' Voluntary Green-e Energy program thru 2023. Over the course of the Initial Crediting Period, the Project's generation was:

- used to generate VCUs from 2009-2014
- sold as Voluntary Green-e RECs from January 1, 2015 - June 30, 2018,
- used to generate VCU's from July 1, 2018 thru December 31, 2019
- sold as Voluntary Green-e RECs from January 1, 2020 thru June 30, 2020
- used to generate VCU's from July 1, 2020 thru December 31, 2020

Importantly, VCUs were not generated during the periods that the environmental attributes were monetized through the sale of RECs.

As noted above, the Project's RECs generated for which VCUs are being claimed during this Monitoring Period (the first period under the second crediting period) were not used, claimed, or retired in any other program.

1.11 Sustainable Development Contributions

No SDG related activities were implemented during this Monitoring Period, nor does the project make any claims to have contributed to any SDG Goals over its lifetime.

2 SAFEGUARDS

2.1 No Net Harm

The largest potentially negative environmental impact is avian mortality, and BEPC is committed to operating the project to minimize the occurrence of such events. During previous monitoring periods BEPC temporarily shut down the project due to whooping cranes in the project area. BEPC has developed a formal program and conducts training for all project employees twice a year on the whooping cranes' spring and fall migrations as well as any contractors who are scheduled to be onsite during the migration period. The training program describes how to recognize a whooping crane, how to track them once spotted and how to protect them from the wind turbines. For the Monitoring Period covered in this report there were no avian issues reported.

BEPC is unaware of any potentially negative socio-economic impacts. In fact, the local community has been very involved in the project and has benefited from it both economically as well as in a number of social criteria. The project spent a great deal of money improving the local roads during the construction phase and also contributes to the local economy thru its payment of taxes to Ward County in which it operates as well as wind lease payments to the local landowners.

2.2 Local Stakeholder Consultation

There are three primary categories of local stakeholders: government, local landowners, and first responders. While there was extensive stakeholder engagement during the initial permitting phase of the project, for the most part at this point communications are limited to when issues arise. To that end BEPC maintains the following policies:

- Prairiewinds ND1, like all wind projects, is subject to certain local, state and federal oversight and has staff that is responsible for all ongoing reporting requirements as well as any ad hoc requests. Many of these reports are in the public domain (e.g. the Energy Information Association publishes annual generation data from the facility).
- During the permitting and construction phase there were regularly scheduled meetings with the public. Beginning with the Project's commencement of commercial operations there are no formally scheduled meetings, and issues are addressed as they arise. At this time BEPC is unaware of any pending land owner issues, though when BEPC is notified of a stakeholder concern they have procedures in place to direct the concern to the appropriate department, such as the Plant Operations, Right of Way or Legal team.
- Regarding first responders, BEPC holds annual emergency response meetings on the wind farm site, where the safety coordinator invites all local public

officials including the Sheriff's Department, Fire Department, ambulance services, emergency dispatch center, and emergency management coordinator.

Due to the substantial economic and social benefits it has generated for the community, the Project has and continues to enjoy tremendous local support. There have been to date no stakeholder requests for project modifications other than an inquiry from GE Renewable Energy regarding the potential to repower the facility.

2.3 AFOLU-Specific Safeguards

For non-AFOLU projects, this section is not required.

3 IMPLEMENTATION STATUS

3.1 Implementation Status of the Project Activity

Prairiewinds ND1 came online on December 30, 2009 and experienced normal operations from then through December 31, 2020 as part of the Initial Crediting Period.

Over the course of this Monitoring Period the Project has also experienced normal operations. The following events that impacted its electrical generation:

- WAPA Maintenance/Line Work– The Project was taken completely offline at WAPA's request on the following occasions:
 - 1/12/2021 (9:41 to 10:27 CST)
 - 2/24/2021 (4:36 to 6:01 CST)
 - 11/10/2021 (11:00 to 13:30)
- Substation upgrade and testing – The Project was taken completely offline for the local member cooperative to upgrade and test the Radar Hill substation:
 - 11/18/2021 (9:00 CDT) to 11/23/2021 (1200 CDT)
 - 12/22/2021 (10:00 CDT) to 12/22/2021 (1400 CDT)
- Wind turbine maintenance – The Project was partially derated to perform annual base bolt testing and tensioning on the following occasion:
 - 9/20/2021 (6:00 CDT to 1600 CDT) – derate to 88.5 MW's
 - 9/21/2021 (6:00 CDT to 1600 CDT) – derate to 88.5 MW's
 - 9/22/2021 (6:00 CDT to 1600 CDT) – derate to 96 MW's
 - 9/23/2021 (6:00 CDT to 1600 CDT) – derate to 88.5 MW's
 - 9/24/2021 (6:00 CDT to 1600 CDT) – derate to 88.5 MW's

Other than these curtailments, no other unscheduled outages or events took place and the Project operated normally.

A Schweitzer Engineering Laboratories SEL-734 revenue grade meter ((Schweitzer Engineering Laboratories Serial No. 2009093450, Model No. SEL 734) installed at the Nelson Tap Substation interconnection point to SPP measures the amount of power delivered to the grid by the Project on a continuous basis; data is aggregated hourly and is reported in a MV90 report with 8760 separate data points for the number of kWh generated each hour. Both WAPA and the Basin-QRE Group read this meter on a monthly basis, and the Basin-QRE Group reports the number of megawatt hours (MWhs) generated to the Midwest Renewable Energy Tracking System (M-RETS), which then issues Renewable Energy Credits (RECs) to the project's account. As noted in the project description, the project's registration in M-RETS 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 M-RETS generation records are being provided to corroborate the number of MWhs and RECs generated. For the Monitoring Period there were no significant discrepancies identified and the only variations for 2021 were due to the rounding of fractional MW's. The difference between the annual M-RETS value and the MV90 value is an extremely small 0.00006% due to rounding.

As documented in the Initial Project Description, per the Interconnect Agreement the Schweitzer Engineering Laboratories meter is to be tested at a minimum every three years. The most recent test was conducted on 9/17/2020 and found to be operating in a satisfactory manner.

3.2 Deviations

3.2.1 Methodology Deviations

No methodology deviations were applied during this Monitoring Period.
No methodology deviations were applied during previous reporting periods.

3.2.2 Project Description Deviations

Monitoring period of 1/1/2021 – 12/31/2021: We recognize no deviations from the Project Description filed as part of the application for the Project's Second Crediting Period.

3.3 Grouped Projects

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

4 DATA AND PARAMETERS

4.1 Data and Parameters Available at Validation

Data / Parameter	$EF_{grid,CM,y}$
Data unit	Metric tons / MWh
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 923/860/930 databases and EIA fuel emissions factors
Value applied	0.3730
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 = 0.4763 and Build Margin = 0.0630 For detailed calculations see Section 4 of the Updated Project Description for the Second Crediting Period.
Purpose of Data	Calculation of baseline emissions
Comments	The ex-ante option is chosen

Data / 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 923/860/930 databases and EIA fuel emissions factors
Value applied	0.4763
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 4 of the Updated Project Description for the Second Crediting Period
Purpose of Data	Calculation of baseline emissions
Comments	The ex-ante option is chosen

Data / 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 database
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
Comments	N/A

Data / 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 databases and EIA Fuel emissions factors
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
Comments	N/A

Data / 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
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
Comments	N/A

Data / 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 database 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
Comments	N/A

Data / 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	0.0630
Justification of choice of data or description of measurement methods and procedures applied	For detailed calculations see Section 4 of the Updated Project Description for the Second Crediting Period
Purpose of Data	Calculation of baseline emissions
Comments	N/A

Data / 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 4 of the Section 4 of the Updated Project Description for the Second Crediting Period
Purpose of Data	Calculation of baseline emissions
Comments	This factor uses the power generation efficiency factor and the CO2 emissions factor of fossil fuel type l in year y.

Data / Parameter	For Build Margin - $\eta_{m,y}$
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
Comments	N/A

4.2 Data and Parameters Monitored

Data / Parameter	EG _{facility,2021}
Data unit	MWhs
Description	Quantity of net electricity generation supplied by the project plant/unit to the grid in 2021 (MWhs)
Source of data	Project activity revenue meter at the site (SEL-734 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 interrogates the meter and submits the 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.
Frequency of monitoring/recording	Data Recording: Continuous Data Aggregation: Hourly Data Monitoring/Reporting: Monthly
Value monitored	EG _{facility,2021} = 332,941 MWh
Monitoring equipment	The Project operator has installed a Schweitzer Engineering Laboratories SEL-734 revenue grade meter (Serial No. 2009093450) metering device.
QA/QC procedures to be applied	Per the interconnection agreement and WAPA Metering Guidelines. This meter was last tested on 9/17/2020.
Purpose of the data	Calculation of baseline emissions
Calculation method	Meter readings
Comments	N/A

4.3 Monitoring Plan

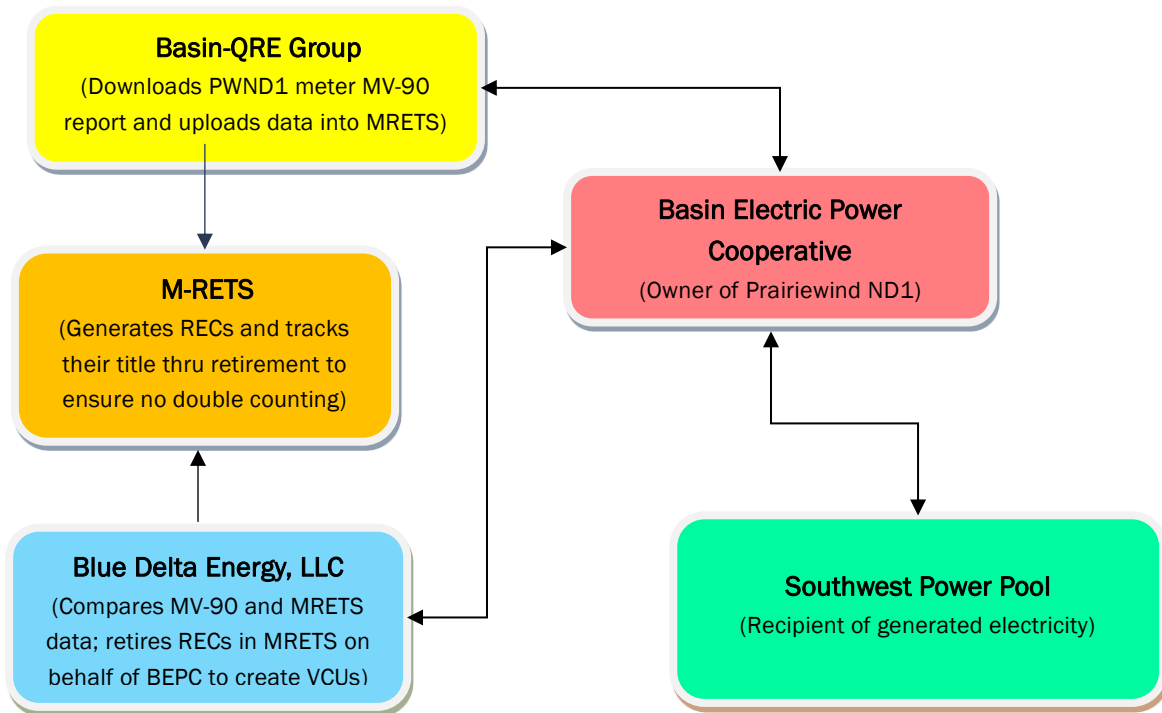


Figure 4 Relationship of parties involved in tracking the Project data

Parties Involved in tracking the Project Data:

Basin Electric Power Cooperative: owner and operator of the Project.

Southwest Power Pool (SPP): the recipient of all electricity generated by the project.

Basin-QRE Group: the internal entity at BEPC responsible for downloading the aggregated hourly data from the meter using MV-90 software and uploading the monthly electricity generation to the M-RETS Renewable Electricity registry.

M-RETS: an independent non-profit data registry responsible for creating RECs (including verifying the volume based on error checks) and tracking the providence of the RECs from creation thru their retirement as part of the creation of the VCUs.

Blue Delta Energy, LLC: the consultant and authorized representative for BEPC responsible for preparing the verification and validation documents for the Project on behalf of BEPC. Blue Delta personnel were involved with the original Project validation and have completed all but one of the previous Monitoring Reports for the Project.

For contact information of the parties involved in the project, see Sections 1.3 Project Proponent and 1.4 Other Entities Involved in the Project.

The following provides a summary of the data recording, collection, verification and processing procedures for the Project as well as the QA/QC and retention standards:

- A Schweitzer Engineering Laboratories SEL-734 revenue grade meter (Serial No. 2009093450) records power delivered to the SPP grid on a continuous basis.
- Data recording takes place on a monthly basis when the Basin-QRE group uses MV-90 software to interrogate the SEL meter and download an Excel report (the “MV-90 report”) which aggregates the generation on an hourly basis.
- The Basin QRE group then uploads this file into the M-RETS Renewable Electricity registry, which performs validation checks on the input data as a part of its REC creation process.
- The M-RETS RECs represent the Project’s electricity generation (EG_{facility,2021}) used to calculate the Project’s emissions reductions.
- Based on the Interconnection Agreement between PWSO1 and WAPA as well as the WAPA Metering Guidelines, meter calibrations are to take place every three years at a minimum, though BEPC normally conducts testing on a more frequent basis. The most recent meter test was conducted on 9/17/2020 by Central Electric (a BEPC member cooperative).
- BDE’s senior management reviews both the source level MV-90 reports and compares them to the annual quantity of RECs created in MRETS, and also reviews the meter test to see if there were any errors or non-conformities that need to be addressed by BEPC. (For this 2021 Crediting Period, the MRETS generation figure was less than 1 MWh lower as compared to the aggregated MV-90 report total, the difference being explained due to rounding).
- Once BDE is satisfied with its accuracy, the M-RETS data is included in this Monitoring Report, and the calculation of the emissions reductions are performed.
- BDE retires the RECs in M-RETS prior to the creation of the VCUs, and the M-RETS REC retirement report is provided to the Verifier.
- Monitoring records will be retained for 12 years.
- The final step of non-conformance resolution is to review and (if necessary) update the appropriate sections of the QA/QC procedures.

5 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

5.1 Baseline Emissions

The total MWhs generated (as reported in M-RETS) for the period January 1, 2021 thru December 31, 2021 is 332,941 MWhs

The Baseline Emissions are calculated by multiplying the MWhs utilized, by the combined margin ($EF_{grid,CM,y}$), which is 0.3730 metric tons CO₂e / MWh.

Hence the Baseline Emissions are:

$$332,941 \text{ MWhs} * 0.3730 \text{ metric tonnes} / \text{MWh} = 124,186 \text{ metric tons.}$$

5.2 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.

5.3 Leakage

Per the methodology ACM0002, no leakage is considered.

5.4 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)
2021	124,186	-	-	124,186
Total	124,186	-	-	124,186