

Crow Lake Wind Emissions Reduction Project

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1 PROJECT DETAILS

1.1 Summary Description of Project

The Crow Lake Wind project site is located east of Chamberlain, South Dakota. The site contains 100 GE 1.5-megawatt turbines owned by PrairieWinds SD 1, Inc. (PWSD1) - a wholly-owned subsidiary of Basin Electric Power Cooperative (BEPC) - 7 turbines owned by South Dakota Wind Partners (SDWP), a South Dakota limited liability company, and one turbine owned by Mitchell Technical Institute (MTI). The output of all of the turbines at the Crow Lake Project site is ultimately purchased by BEPC pursuant to Purchase Power Agreements (PPAs) by and between each of the turbine owners listed above. The 108 turbines described above have an aggregate generating capacity of 162 megawatts (MW). The commercial operation date of this project is February 1, 2011.

In addition to purchasing the output of the turbines located on the Crow Lake project site, BEPC operates and controls the turbines pursuant to an Operation and Management Agreement with PWSD1. The wind turbines at the Crow Lake project site are interconnected to the Western Area Power Administration (WAPA) – Upper Great Plains East (UGPE) bulk transmission system (“Integrated System” or “IS”), which is located within the Midwest Reliability Organization (MRO) region. The turbines on the Crow Lake project site generate emissions reductions by delivering onto the bulk transmission system electricity generated by use of a renewable fuel source (wind).

This project was developed 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).

Crow Lake Wind is a stand-alone project, and it is not a grouped project.

1.3 Project Proponent

The project co-proponents are BEPC, SDWP, and MTI. BEPC’s wholly owned subsidiary PWSD1 owns 100 turbines (150 MW) of the Crow Lake site; SDWP owns 7 turbines (10.5 MWs); and MTI owns 1 turbine (1.5 MW).

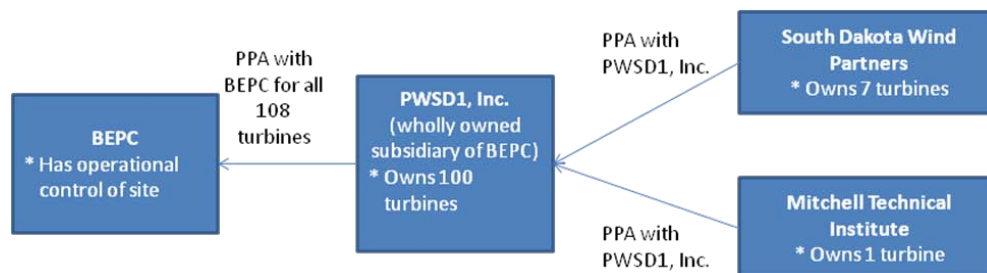
BEPC is a not-for-profit, wholesale electric generation and transmission cooperative based in North Dakota that provides electricity to 2.8 million customers across 135 rural distribution companies in 9 states (MT, MN, IA, SD, ND, CO, NM, NB, WY). Basin’s charter is to provide low cost, reliable electric power to its members. BEPC incorporated its wholly owned subsidiary PrairieWinds SD1 (PWSD1) to develop the Crow Lake Wind project. Although PWSD1 is the owner of more than 92% of the wind project, it has delegated operating control to its parent, BEPC, pursuant to an Operation & Management Agreement; hence, BEPC has operational

control over the site. BEPC is purchasing all of the power generated at the site from its subsidiary PWSD1 via an arms-length power purchase agreement (PPA). PWSD1 in turn is purchasing power from the turbines owned by the SDWP and MTI turbines via two separate PPAs.

SDWP is a limited liability company formed to provide an opportunity for investment by South Dakota residents in the growing wind industry. Four South Dakota organizations helped develop SDWP to provide the opportunity for their members to be a part of wind in South Dakota: East River Electric Coop, SD Corn Utilization Council, SD Farmers Union and SD Farm Bureau. SDWP has contracted with PWSD1 (which in turn has contracted with BEPC) to operate its turbines at the Crow Lake Wind project site.

MTI opened in 1968 in a system of post-high school vocational technical education in South Dakota that included four area institutes and the South Dakota Office of Adult, Vocational and Technical Education. Nearly 14,000 individuals have graduated from MTI since it opened. The central mission of the Institute is to provide job preparatory programs on a full- or part-time basis to all who can benefit. MTI's turbine is used as a teaching tool for students in its wind turbine technician program. As with South Dakota Wind Partners, MTI's turbine is operated by PWSD1 (which in turn has contracted with BEPC).

The graph below depicts the contractual relationships that are part of this project. Please note that BEPC (and not its wholly owned subsidiary PWSD1) is being listed as one of the three project co-proponents because BEPC has operational control over the projects pursuant to an operations and management agreement, and it owns the rights to all of the emissions reductions for the duration of the crediting period.



Contact information for BEPC is:

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Contact information for SDWP is:

Nick Sershen, Project Coordinator South Dakota Wind Partners Val-Add Service Corporation nick@val-addservice.com 605-271-0578

Contact information for MTI is:

Greg Von Wald, President Mitchell Technical Institute Greg.vonwald@mitchelltech.edu 605-995-3022

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 commercial operation date of the project is February 1, 2011.

1.6 Project Crediting Period

The project crediting period for the projects will commence February 1, 2011, and conclude January 31, 2021, for a total of 10 years.

1.7 Project Location

The Crow Lake Wind project is located across the span of Aurora, Jerauld and Brule counties, east of Chamberlain, South Dakota on a 36,000-acre plot of land at grid coordinates: Latitude: 43.8°N Longitude: -98.8°.



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

With a commercial operation date of February 1, 2011, Crow Lake Wind came online this year experienced normal operations for the period ending December 31st, 2011. The project generated 491,659 MWh in the period from February 1 – December 31, 2011.

2011 saw major flooding take place in the Upper Plains system. This resulted in significantly higher quantities of hydro resources being available to the region than normal. As a result, a number of other resources were curtailed, including the Crow Lake Wind project. Total curtailments between May – November 2011 were 35,531 MWh. This electricity was produced but was not delivered to the grid – hence, this generation is not included in the emissions reduction calculations below. Other than these curtailments, no other unscheduled outages or events took place and the project operated normally.

2.2 Deviations from the Monitoring Plan

As documented in the project description, the PWSD1 has a revenue grade meter installed at the Wessington Springs Interconnection point which measures the total amount of power delivered to the grid by the Crow Lake project. The JEMStar meter, Serial No. 10 21 13576, Model JS-09R6110-C3 was tested on 1/18/2011 and found to operating in a satisfactory manner. Since the tests for Crow Lake were conducted this year, the next testing phase is not expected until 2014.

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 for the number of 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 February 1 – December 31, 2011, the average difference between the MRETS value and the MV90 value is extremely small - 0.0005%.

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.

Since this variance is small, we do not propose a deviation from the monitoring plan, and rely on the values generated in the MRETS system to document the number of MWh the project produced.

2.3 Grouped Project

Crow Lake Wind is a stand-alone project, and it is not a grouped project.

3 DATA AND PARAMETERS

3.1 Data and Parameters Available at Validation

Data Unit / 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
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 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
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 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.
Frequency of monitoring/recording:	Data Recording: Continuous Data Aggregation: Hourly Data Monitoring: Monthly
Value applied:	Varies based on meter output
Monitoring equipment:	The project operator has installed a JemStar revenue grade meter (Serial No. 10 21 13576, Model JS-09R6110-C3) metering device. This meter was tested on 1/18/2011.
QA/QC procedures to be applied:	Per the interconnection agreement and WAPA Metering Guidelines. This meter was tested on 1/18/2011
Calculation method:	Meter readings
Any comment:	N/A

3.3 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. 10 21 13576, Model JS-09R6110-C3) generates the MV90 data; the meter is read by WAPA monthly.

- o Based on the Interconnection Agreement between PWSD1 and WAPA, and the WAPA Metering Guidelines, meter testing took place 1/18/2011.
- o Extraordinary Events: Other than the curtailments described in Section 2.1, no other unscheduled events 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 February 1, 2011 – December 31, 2011 are: 491,659 MWh. The Baseline Emissions are calculated by multiplying the MWh produced (EG facility,y) by the combined margin (EFgrid,CM,y), which is 0.8422 metric tons CO₂e / MWh.

Hence the Baseline Emissions are: 491,659 MWh * 0.8422 metric tons / MWh = 414,075 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, $ER_y = 414,075 - 0 = 414,075$ metric tons.

5 ADDITIONAL INFORMATION

None.