Monitoring Report

Title: Hebei Yuxian Kongzhongcaoyuan 49.5MW Wind Farm Project

CDM Registration Reference Number: 2088

Monitoring period: 23 Feb 2009-24 June 2009

Prepared by Hebei CDM Project Office

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1 Introduction

The purpose of this monitoring report for Hebei Yuxian Kongzhongcaoyuan 49.5MW wind farm project is to calculate the emission reductions achieved by the project activity in the period covered by this report, and to serve as the basis for the verification of these reductions and issuance of the CERs.

1.1 monitoring period

2009.02.23-2009.06.24

1.2 Document details

Version 01

2 Project description

2.1 Title

Hebei Yuxian Kongzhongcaoyuan 49.5MW Wind Farm Project

2.2 UNFCCC reference number

2088

2.3 Project participants

Hebei Construction Investment Yuzhou Wind Energy Co., Ltd.
Shell Trading International Limited.
CEZ a.s.

2.4 Project summary

Hebei Yuxian Kongzhongcaoyuan 49.5MW Wind Farm Project is located in the Xiagongcun Village of Yuxian County, Zhangjiakou City, Hebei Province in North China. The site location’s coordinates are East Longitude of 114°30′45″~114°32′25″ and North Latitude of 39°36′32″~39°33′58.6″. The project consists of 33 turbines with the unit capacity of 1500kW. The turbines were manufactured by Dongfang Steam Turbine Works. The project is expected to generate electricity approximately 111.61 GWh per year which is sold into North China Power Grid.

2.5 Category of Project activity

Sectoral scope 1: Energy industries
2.6 Eligible GHGs

1. Carbon dioxide

2.7 Project timeline

<table>
<thead>
<tr>
<th>Table 1 Project timeline</th>
</tr>
</thead>
<tbody>
<tr>
<td>CDM registration Date</td>
</tr>
<tr>
<td>CDM crediting period (Renewable)</td>
</tr>
<tr>
<td>Start of this monitoring period</td>
</tr>
<tr>
<td>End of this monitoring period</td>
</tr>
</tbody>
</table>

3 Methodology

3.1 Baseline Methodology

The approved baseline methodology applied in the proposed project activity is ACM0002 – “Consolidated methodology for grid-connected electricity generation from renewable sources (version 06)”.

Applying ACM0002, the emission reductions achieved by the project activity can be calculated by multiplying the net electricity supplied to the grid and the appropriate emission factor of the grid. The emission reductions $ER_y$ by the project activity during a given year $y$ is

$$ ER_y = BE_y = EG_y \times EF_y $$

Where:

- $BE_y$ is the baseline emissions.
- $EG_y$ is the net electricity supplied to the grid.
- $EF_y$ is the CO$_2$ emission factor of the grid.

The emission factor $EF_y$ of the grid is represented as a combination of the Operating Margin and the Build Margin, and was fixed for the duration of the crediting period in the PDD. The Operating Margin emission factor $EF_{OM,y}$ was calculated in the PDD as 1.1208 tCO$_2$/MWh. The Build margin emission factor $EF_{BM,y}$ was calculated as 0.9397 tCO$_2$/MWh. The weighted average of Operating and Build Margin factors is

$$ EF_y = W_{OM} \times EF_{OM,y} + W_{BM} \times EF_{BM,y} = 1.0755 \text{CO}_2/\text{MWh}. $$

This factor is fixed during the first 7 years crediting period.
3.2 Monitoring Methodology

The approved monitoring methodology applied in the proposed project activity is ACM0002 – “Consolidated methodology for grid-connected electricity generation from renewable sources (version 06)”. In keeping with the monitoring methodology, the following parameter needs to be monitored:

\[ \text{EG}_y \]: the net electricity supplied to the grid.

<table>
<thead>
<tr>
<th>ID</th>
<th>Data type</th>
<th>Data variable</th>
<th>Data unit</th>
<th>Recording frequency</th>
<th>Proportion of data to be monitored</th>
<th>How will the data be archived? (electronic/paper)</th>
<th>For how long is archived data to be kept?</th>
</tr>
</thead>
<tbody>
<tr>
<td>EG</td>
<td>Electricity</td>
<td>Electricity supplied to the grid</td>
<td>MWh</td>
<td>Continuous reporting is done monthly</td>
<td>100%</td>
<td>Electronic with paper back up</td>
<td>During the crediting period and two years after</td>
</tr>
</tbody>
</table>

4 Monitoring data

The power line supplying electric power to the grid can also deliver power from the grid to the wind farm in case of emergencies and when the wind farm does not produce enough power for auxiliary power use. The metering equipment runs in two directions and records two readings, i.e. electricity supplied to the grid \( \text{EG}_s \) and electricity consumed from the grid \( \text{EG}_c \). The simplified electrical grid connection diagram is shown in the following figure1:
The electricity supplied to North China Power Grid is continuously measured by the main meter installed at M1 in Figure 1. The readings at 24:00 of the main meters were read and recorded by the grid company on the 24th of each month. A reading (\(E_{G_{s,y}}\)) was recorded at 24:00 of February 22, 2009 for the first crediting period started from February 23, 2009. The electricity consumed from the grid in February was regarded as the \(E_{G_{c,y}}\) of the wind farm in the first calendar month of the crediting period. This is conservative.

The meter instruments at M2 in Figure 1 is the backup meter. The project owner recorded monthly the backup (M2) instruments. The main meter and the backup one are as like as two peas.

In case blackout in the main power line, power delivered to the project through the backup power line (\(E_{G_{\text{backupline,y}}}\)) is measured by instruments at M3 in figure 1.

Net electricity supplied to the grid by the project is calculated on a monthly basis as:

\[
E_{G_y} = E_{G_{s,y}} - E_{G_{c,y}} - E_{G_{\text{backupline,y}}}
\]

With:
- \(E_{G_{s,y}}\) is the electricity supplied to the Grid by the project.
- \(E_{G_{c,y}}\) is the electricity consumed from the grid by the project through the main power line.
- \(E_{G_{\text{backupline,y}}}\) is the electricity delivered to the project through the backup power line.
The monitored data are listed in the following table 2:

<table>
<thead>
<tr>
<th>Period</th>
<th>$EG_{s,y}$ (MWh)</th>
<th>$EG_{c,y}$ (MWh)</th>
<th>$EG_{backup,y}$ (MWh)</th>
<th>$EG_{y}$ (MWh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009.02.23-2009.02.24</td>
<td>287</td>
<td>15.523</td>
<td>0</td>
<td>271.477</td>
</tr>
<tr>
<td>2009.02.25-2009.03.24</td>
<td>8,539</td>
<td>14.23</td>
<td>0</td>
<td>8,524.77</td>
</tr>
<tr>
<td>2009.03.25-2009.04.24</td>
<td>7,544</td>
<td>10.349</td>
<td>0</td>
<td>7,533.651</td>
</tr>
<tr>
<td>2009.04.25-2009.05.24</td>
<td>7,589</td>
<td>7.762</td>
<td>11.568</td>
<td>7,569.67</td>
</tr>
<tr>
<td>2009.05.25-2009.06.24</td>
<td>8,697</td>
<td>11.642</td>
<td>24.993</td>
<td>8,660.365</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>32,656</strong></td>
<td><strong>59.506</strong></td>
<td><strong>36.561</strong></td>
<td><strong>32,559.933</strong></td>
</tr>
</tbody>
</table>

5 Quality Assurance and Quality Control Measures

5.1 Roles and responsibilities

The person with overall responsibility for monitoring activity is Mr Zhao Yongchao. The responsibility for electricity data management reporting and the accuracy of metering equipment in the whole stage is Mr. Cai Zhiyong. Mr. Bai Pengyu and Mr. Yu Lei are responsible for recording, management and storing electronic data. The sales receipt of electricity supplied by the grid is also be kept by them. The responsibility for the calibration and maintenance of the metering equipments is Mr. Cai Zhiyong, Mr. Yang Yongheng and Mr. Li Yugang.

5.2 Training

In this monitoring period, a comprehensive training course including operation of wind turbines, use of monitoring equipments, safety and other relative skill has been held to relative staffs by the project owner.

5.3 Calibrations

The initial calibrations of the metering equipments were done by Hebei Electric Power Research Institute on May 20, 2008 when they were just installed. The second calibrations for main meter and the backup meter were done by Hebei Electric Power Research Institute on May 13, 2009. The validity is one year. The accuracy of both meters is 0.2S and the error in each calibration report didn’t exceed 0.5% of full-scale rating as required in PDD. The copies of their qualification certificates have been sent to DOE.
5.4 QA/QC Procedure

<table>
<thead>
<tr>
<th>ID</th>
<th>QA/QC procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>$E_G$</td>
<td>The data will be directly used for calculation of emission reductions. Sales</td>
</tr>
<tr>
<td></td>
<td>records and other records are used to ensure the consistency.</td>
</tr>
<tr>
<td>$E_{G_{s,y}}$</td>
<td>$E_{G_{s,y}}$ is used in the calculation of $E_G$. In order to accurately monitor $E_G$, the following QA/QC are applied to $E_{G_{s,y}}$: Invoice and accounting vouchers are used to ensure the consistency.</td>
</tr>
<tr>
<td>$E_{G_{c,y}}$</td>
<td>$E_{G_{c,y}}$ is used in the calculation of $E_G$. In order to accurately monitor $E_G$, the following QA/QC are applied to $E_{G_{c,y}}$: Invoice and accounting vouchers are used to ensure the consistency.</td>
</tr>
<tr>
<td>$E_{G_{backupline,y}}$</td>
<td>$E_{G_{backupline,y}}$ is used in the calculation of $E_G$. In order to accurately monitor $E_G$, the following QA/QC are applied to $E_{G_{backupline,y}}$: Invoice and accounting vouchers are used to ensure the consistency.</td>
</tr>
</tbody>
</table>

5.5 Emergency Procedure
In this monitoring period, the wind farm ran smoothly and no emergency happened.

6 Emission reduction calculations

6.1 Project emissions
There is no auxiliary fuel consumed in the project. Therefore, the project activity does not have any GHG emissions.

$PE_y=0$

6.2 Baseline emissions

<table>
<thead>
<tr>
<th>Period</th>
<th>$E_G$(MWh)</th>
<th>$EF$(tCO$_2$e/MWh)</th>
<th>Baseline emission (tCO$_2$e)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009.02.23-2009.06.24</td>
<td>32,559.933</td>
<td>1.0755</td>
<td>35,018</td>
</tr>
</tbody>
</table>

6.3 Leakage
According to ACM0002 version 06, when the baseline scenario is grid power imports, no leakage needs to be considered. According to ACM0002 version 06, the main emission potentially giving rise to leakage in the context of electricity sector projects are emissions arising due to activities such as power plant construction, fuel handling, and land inundation. Project participants do not need to consider these
sources as leakage in applying the methodology. There is no diesel engine/boiler used during the monitoring period. Therefore, the leakage from the project is zero.

$L_y = 0$

### 6.4 Emission reduction calculation

#### Table 4 Emission reduction calculation

<table>
<thead>
<tr>
<th>Period</th>
<th>Baseline emissions (tCO$_2$e)</th>
<th>Project Emissions (tCO$_2$e)</th>
<th>Leakage (tCO$_2$e)</th>
<th>Emission Reductions (tCO$_2$e)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009.02.23-2009.06.24</td>
<td>35,018</td>
<td>0</td>
<td>0</td>
<td>35,018</td>
</tr>
</tbody>
</table>

The total emission reductions of the project for this monitoring period are 35,018 tCO$_2$e.