

**MONITORING REPORT FORM (CDM-MR\*)**  
**Version 01 - in effect as of: 28/09/2010**

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\* as contained within the document entitled "Guidelines for completing the monitoring report form (CDM-MR)" (EB 54 meeting report, annex 34).

## MONITORING REPORT

Version: 02

26/12/2011

Fujian Zhangpu Liuaio 45 MW Wind Power Project

Reference number: 1318

The fourth Monitoring period: 28/05/2010 to 27/05/2011 (both days inclusive)

### SECTION A. General description of the project activity

#### A.1. Brief description of the project activity:

>>

The Fujian Zhangpu Liuaio 45 MW Wind Power Project is located in Liuaio town, Zhangpu County, Fujian Province, P.R.C. It involves the installation of 36 turbines, each of which has a rated output of 1250kW, providing a total capacity of 45MW. The electricity generated from the project is fed into the East China Power Grid.

The project helps reduce GHG emissions generated from the high-growth, coal-dominated power generation. And also, it contributes to sustainability in the region by reducing pollution, creating employment opportunities, promoting the local tourism industry and improving the livelihoods of local people. At a larger scale, the project assists China in stimulating and accelerating the commercialization of grid-connected renewable energy technologies and markets in China.

The project started on 28/12/2006. The first set of wind turbine started operation on 25/06/2007. All the 36 turbines of the project have been put into operation since January 2008 and all the wind turbines work very well during this monitoring period.

The project was registered on 21/01/2008(PDD/Version 06, 12/11/2007), the estimated annual emission reduction in PDD is 84,130 tCO<sub>2</sub>e. Three monitoring periods have been successfully issued, the relevant details of previous monitoring periods are as follows:

| Activity                  | Period                 | Amount of CERs (tCO <sub>2</sub> e) | Date of Issuance |
|---------------------------|------------------------|-------------------------------------|------------------|
| The 1st monitoring period | 21/01/2008-27/05/2008  | 25962                               | 22/08/2008       |
| the 2nd monitoring period | 28/05/2008-27/05/2009  | 70019                               | 03/12/2009       |
| the 3rd monitoring period | 28/05/2009 -27/05/2010 | 65651                               | 20/01/2011       |

This is the 4<sup>th</sup> monitoring period, from 28/05/2010 to 27/05/2011(The 4<sup>th</sup> monitoring period is within the 1<sup>st</sup> crediting period). During the fourth monitoring period (28/05/2010 -27/05/2011), the project has generated the net electricity supply of 81,605.540MWh and achieved 71,812tCO<sub>2</sub>e emission reduction.

#### A.2. Project Participants

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| Name of Party involved (*)((host indicates a host Party) | Private and/or public entity(ies) project participants (*) (as applicable) | Kindly indicate if the Party involved wishes to be considered as project participant (Yes/No) |
|----------------------------------------------------------|----------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|
| People's Republic of China (host)                        | Datang Zhangzhou Wind Power Co., Ltd (project owner)                       | No                                                                                            |
| Netherlands                                              | RWE Supply & Trading Netherlands B.V.                                      | No                                                                                            |

|             |                                          |    |
|-------------|------------------------------------------|----|
| Switzerland | RWE Supply & Trading<br>Netherlands B.V. | No |
|-------------|------------------------------------------|----|

### A.3. Location of the project activity:

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The project site is located in the east of Liuaio peninsula, Zhangpu County in Fujian Province, P.R.C. It has the Taiwan Strait to the east, Gulei Peninsula in the southwest and Jiugang town in the north. The site is 48km from the Zhangpu county government in the northwest, 100km from Zhangzhou Municipality in the north. The exact geographical coordinates of the project are  $117^{\circ} 28' 20'' \sim 117^{\circ} 29' 43''$  E,  $23^{\circ} 34' 25'' \sim 24^{\circ} 0' 39''$  N. Figure 1 shows the location of the project.

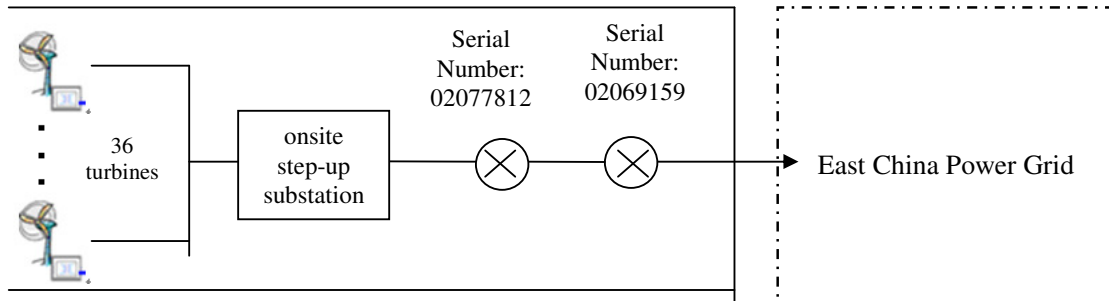


Figure 1: Location of the project

### A.4. Technical description of the project

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Turbines of model 64/1250 manufactured by Suzlon are used for the project. The height of the wheel hub is 65m. The turbines are arranged in a matrix shape with row spacing of 7D and column spacing of 5D. According to the turbine layout, each turbine was equipped with one transformer. The wind power generated is delivered to the 110kV step-up substation by 35kV transmission lines to the East China Power Grid.



### A.5. Title, reference and version of the baseline and monitoring methodology applied to the project activity:

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ACM0002: "Consolidated methodology for grid-connected electricity generation from renewable sources" (ACM0002/ Version 06, 18/05/2006).

**A.6. Registration date of the project activity:**

&gt;&gt;

The PDD version 06 dated 12/11/2007 registered on 21/01/2008

**A.7. Crediting period of the project activity and related information (start date and choice of crediting period):**

&gt;&gt;

As the project was registered on 21/01/2008, the first crediting period of the project is from 21/01/2008 to 20/01/2015(renewable). The starting date of the crediting period is 21/01/2008.

**A.8. Name of responsible person(s)/entity(ies):**

CDM Department of China National Water Resources & Electric Power Materials & Equipment Co., Ltd. (CWEME)

Contact Information:

Ms. Mengqing, E-mail: mengqing@cweme.com, TEL: +86 10 51967886.

**SECTION B. Implementation of the project activity****B.1. Implementation status of the project activity**

&gt;&gt;

The project started on 28/12/2006. The first set of wind turbine started operation on 25/06/2007. All the 36 turbines of the project have been put into operation since January 2008 and all the wind turbines work very well during this monitoring period.

During the monitoring period, the project is implemented in accordance with the validated and registered PDD, and no malfunction was occurred on the operation of equipments during this monitoring period. Meanwhile, there were no events or situations that occurred during the monitoring period, which may impact the applicability of the methodology.

**B.2. Revision of the monitoring plan**

&gt;&gt;

Not applicable

**B.3. Request for deviation applied to this monitoring period**

&gt;&gt;

Not applicable

**B.4. Notification or request of approval of changes**

&gt;&gt;

Not applicable.

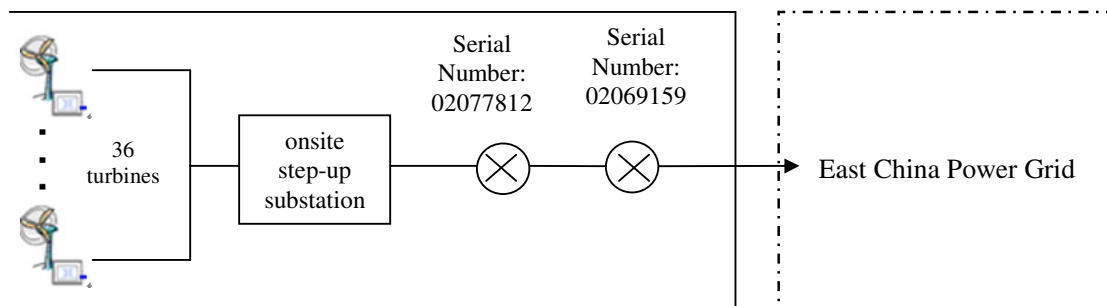
**SECTION C. Description of the monitoring system**

The approved monitoring methodology ACM0002 is used for developing the monitoring plan. Monitoring tasks must be implemented according to the monitoring plan in order to ensure that the real, measurable and long-term greenhouse gas (GHG) emission reduction for the project is monitored and reported.

### C.1. Description of the monitoring system

A pair of meters (one main meter and one backup meter) with accuracy of 0.2s have been installed at the wind farm to monitor the electricity exported to and imported from the grid.

Location of the metering equipment is shown in figure 2 below:



**Figure 2: Location of the metering equipment**

### C.2. Roles and Responsibility

The monitoring plan clearly states the roles and responsibilities of the three persons from the project owner who are involved in the monitoring of grid-connected electricity generation by the project.

### C.3. Data monitoring

The specific steps for monitoring the electricity delivered to the grid are listed below:

The data is monitored through metering equipment at the wind farm.

The exported and imported electricity measured by the main meter are aggregated at 00:00 on 28th day in every month by and are recorded by assigned persons from the grid company and the wind farm,

After the monthly aggregated electricity is confirmed by the wind farm and the grid company, sales receipts covering the exported and imported electricity in the corresponding periods are issued by the grid company accordingly. Periodical electricity sales receipts are used for cross-check.

The exported and imported electricity measured by the backup meter are aggregated at 00:00 on 28th day in every month (at 00:00 on the 26<sup>th</sup> day of February) and are recorded by assigned persons from the wind farm.

### C.4. Emergency procedures

Should any previous months reading of the main meter be inaccurate by more than the allowable error, or otherwise functioned improperly, the grid-connected electricity generated by the project shall be determined by:

First, by reading the backup meter, unless a test by either party reveals it is inaccurate;

If the backup system is not with acceptable limits of accuracy or is otherwise performing improperly the project owner and grid company shall jointly prepare an estimate of the correct reading;

If the project owner and the grid company fail to agree the estimate of the correct reading, then the matter will be referred for arbitration according to agreed procedures.

### C.5. Data management system

Physical document such as paper-based maps, diagrams and environmental assessments are collected in a central place, together with this monitoring plan. In order to facilitate auditors' reference of relevant literature relating to the project, the project material and monitoring results are indexed. All paper-based information is stored by the technology department of the project owner and all the material has a copy for backup. And all data including calibration records is kept until 2 years after the end of the total credit time of the CDM project.

## SECTION D. Data and parameters

| <b>D.1. Data and parameters determined at registration and not monitored during the monitoring period, including default values and factors</b> |                                                                                                     |
|-------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
| <b>Data / Parameter:</b>                                                                                                                        | $EF_y$                                                                                              |
| Data unit:                                                                                                                                      | tCO <sub>2</sub> e/MWh                                                                              |
| Description:                                                                                                                                    | Emission factor of the Grid                                                                         |
| Source of data used:                                                                                                                            | PDD                                                                                                 |
| Value(s) :                                                                                                                                      | 0.880                                                                                               |
| Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)                                                          | Used for Baseline emission calculation                                                              |
| Additional comment:                                                                                                                             | The value of $EF_y$ calculated ex-ante is used and isn't updated during the first crediting period. |

| D.2. Data and parameters monitored                                                                                     |                                                                                                                                                                                        |                          |                          |                       |
|------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|--------------------------|-----------------------|
|                                                                                                                        |                                                                                                                                                                                        |                          |                          |                       |
| Data / Parameter:                                                                                                      | EG <sub>y</sub>                                                                                                                                                                        |                          |                          |                       |
| Data unit:                                                                                                             | MWh                                                                                                                                                                                    |                          |                          |                       |
| Description:                                                                                                           | Net electricity delivered to grid in year y                                                                                                                                            |                          |                          |                       |
| Measured /Calculated /Default:                                                                                         | Measured                                                                                                                                                                               |                          |                          |                       |
| Source of data:                                                                                                        | Meter reading recording                                                                                                                                                                |                          |                          |                       |
| Value(s) of monitored parameter:                                                                                       | 81,605.540MWh                                                                                                                                                                          |                          |                          |                       |
| Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)                                 | Baseline emission calculation.                                                                                                                                                         |                          |                          |                       |
| Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity): |                                                                                                                                                                                        |                          |                          |                       |
|                                                                                                                        | Meter description                                                                                                                                                                      | Type                     | accuracy                 | Serial Number         |
|                                                                                                                        | M1 (backup meter)                                                                                                                                                                      | AINRTAL                  | 0.2s                     | 02077812              |
|                                                                                                                        | M2 (main meter)                                                                                                                                                                        | AINRTAL                  | 0.2s                     | 02069159              |
|                                                                                                                        |                                                                                                                                                                                        |                          |                          |                       |
|                                                                                                                        | Meter description                                                                                                                                                                      | Calibration Date         | Validity                 | Calibration Frequency |
|                                                                                                                        | M1 (backup meter)                                                                                                                                                                      | 11/11/2009<br>01/06/2010 | 10/11/2010<br>31/05/2011 | annually              |
| M2 (main meter)                                                                                                        | 11/11/2009<br>01/06/2010                                                                                                                                                               | 10/11/2010<br>31/05/2011 |                          |                       |
| Measuring/Reading/ Recording frequency:                                                                                | Continuously measured and monthly recorded                                                                                                                                             |                          |                          |                       |
| Calculation method (if applicable):                                                                                    | EG <sub>y</sub> =EG <sub>export</sub> -EG <sub>import</sub><br>EG <sub>export,y</sub> –Electricity exported to the grid<br>EG <sub>import,y</sub> – Electricity imported from the grid |                          |                          |                       |

|                           |                                                                                                                                                                                                                                                                                                                            |
|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| QA/QC procedures applied: | According to national standard such as <i>Technical administrative code of electric energy metering (DL/T448—2000)</i> , meters are calibrated annually by Fujian Provincial Electric Power Company Metrological Verification Center <sup>1</sup> . Data measured by meters is cross checked by electricity sales receipt. |
|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## SECTION E. Emission reductions calculation

### E.1. Baseline emissions calculation

>>

The baseline emission  $BE_y$  during the monitoring period results from:

$$BE_y = EG_y * EF_y$$

Where

$EG_y$  – Net electricity delivered to the grid in year y

$EF_y$  – Emission factor of the grid (calculated ex-ante and isn't updated during the first crediting period) in year y

$$EG_y = EG_{\text{export},y} - EG_{\text{import},y}$$

Where

$EG_{\text{export},y}$  – Electricity exported to the grid in year y

$EG_{\text{import},y}$  – Electricity imported from the grid in year y

<sup>1</sup> Fujian Provincial Electric Power Company Metrological Verification Center is authorized by Quality and Technology Supervision Bureau of Fujian Province during the period of 18/09/2009-17/09/2012 with Certificate No. (Min)Faji (2006)270021.

**Table 1. Electricity Exported to the Grid**

| Period                 | Electricity exported to the grid by meter reading |                             |               |                                              | Electricity exported to the grid from sales receipts(MWh) | Value of electricity exported to the grid used for the calculation of emission reductions(MWh) |
|------------------------|---------------------------------------------------|-----------------------------|---------------|----------------------------------------------|-----------------------------------------------------------|------------------------------------------------------------------------------------------------|
|                        | Meter reading at period start                     | Meter reading at period end | Magnification | Exported electricity from meter reading(MWh) |                                                           |                                                                                                |
|                        | A                                                 | B                           | C             | D=(B-A)*C                                    | E <sup>2</sup>                                            | F=Min (D, E) <sup>3</sup>                                                                      |
| 28/05/2010-27/06/2010  | 278.4922                                          | 290.9737                    | 440           | 5,491.860                                    | 5,491.291                                                 | 5,491.291                                                                                      |
| 28/06/2010-27/07/2010  | 290.9737                                          | 298.0690                    | 440           | 3,121.932                                    | 3,118.712                                                 | 3,118.712                                                                                      |
| 28/07/2010-27/08/2010  | 298.0690                                          | 304.9778                    | 440           | 3,039.872                                    | 3,035.047                                                 | 3,035.047                                                                                      |
| 28/08/2010-27/09/2010  | 304.9778                                          | 313.2743                    | 440           | 3,650.460                                    | 3,644.162                                                 | 3,644.162                                                                                      |
| 28/09/2010-27/10/2010  | 313.2743                                          | 335.1193                    | 440           | 9,611.800                                    | 9,596.290                                                 | 9,596.290                                                                                      |
| 28/10/2010-27/11/2010  | 335.1193                                          | 358.0129                    | 440           | 10,073.184                                   | 10,060.961                                                | 10,060.961                                                                                     |
| 28/11/2010-27/12/2010  | 358.0129                                          | 371.9324                    | 440           | 6,124.580                                    | 6,115.026                                                 | 6,115.026                                                                                      |
| 28/12/2010-27/01/2011  | 371.9324                                          | 397.2925                    | 440           | 11,158.444                                   | 11,149.342                                                | 11,149.342                                                                                     |
| 28/01/2011-25/02/2011* | 397.2925                                          | 416.8298                    | 440           | 8,596.412                                    | 8,580.515                                                 | 8,580.515                                                                                      |
| 26/02/2011-27/03/2011  | 416.8298                                          | 441.8312                    | 440           | 11,000.616                                   | 10,982.734                                                | 10,982.734                                                                                     |
| 28/03/2011-27/04/2011  | 441.8312                                          | 457.3756                    | 440           | 6,839.536                                    | 6,830.094                                                 | 6,830.094                                                                                      |
| 28/04/2011-27/05/2011  | 457.3756                                          | 464.9610                    | 440           | 3,337.576                                    | 3,330.750                                                 | 3,330.750                                                                                      |
| Total                  |                                                   |                             |               | 82,046.272                                   | 81,934.924                                                | 81,934.924                                                                                     |

\*The exported and imported electricity measured are aggregated and recorded at 00:00 on 25th day in February.

**Table 2. Electricity Imported from the Grid**

| Period                | Electricity imported from the grid by meter reading |                             |               |                                              | Electricity imported from the grid from sales receipts(MWh) | Value of electricity imported from the grid used for the calculation of emission reductions (MWh) |
|-----------------------|-----------------------------------------------------|-----------------------------|---------------|----------------------------------------------|-------------------------------------------------------------|---------------------------------------------------------------------------------------------------|
|                       | Meter reading at period start                       | Meter reading at period end | Magnification | Imported electricity from meter reading(MWh) |                                                             |                                                                                                   |
|                       | A                                                   | B                           | C             | D=(B-A)*C                                    | E                                                           | F=Max (D, E) <sup>4</sup>                                                                         |
| 28/05/2010-27/06/2010 | 1.5980                                              | 1.6566                      | 440           | 25.784                                       | 25.784                                                      | 25.784                                                                                            |

<sup>2</sup>.The exported electricity from the sales receipts is decided by the grid company according to PPA.

<sup>3</sup> For consideration of conservativeness, smaller value of exported electricity is used for the calculation of emission reductions.

<sup>4</sup> For consideration of conservativeness, bigger value of imported electricity is used for the calculation of emission reductions.



|                       |        |        |     |         |         |         |
|-----------------------|--------|--------|-----|---------|---------|---------|
| 28/06/2010-27/07/2010 | 1.6566 | 1.7942 | 440 | 60.544  | 60.544  | 60.544  |
| 28/07/2010-27/08/2010 | 1.7942 | 1.8910 | 440 | 42.592  | 42.592  | 42.592  |
| 28/08/2010-27/09/2010 | 1.8910 | 2.0300 | 440 | 61.160  | 61.160  | 61.160  |
| 28/09/2010-27/10/2010 | 2.0300 | 2.0601 | 440 | 13.244  | 13.244  | 13.244  |
| 28/10/2010-27/11/2010 | 2.0601 | 2.0702 | 440 | 4.444   | 4.444   | 4.444   |
| 28/11/2010-27/12/2010 | 2.0702 | 2.1167 | 440 | 20.460  | 20.460  | 20.460  |
| 28/12/2010-27/01/2011 | 2.1167 | 2.1263 | 440 | 4.224   | 4.224   | 4.224   |
| 28/01/2011-25/02/2011 | 2.1263 | 2.1460 | 440 | 8.668   | 8.668   | 8.668   |
| 26/02/2011-27/03/2011 | 2.1460 | 2.1946 | 440 | 21.384  | 21.384  | 21.384  |
| 28/03/2011-27/04/2011 | 2.1946 | 2.2636 | 440 | 30.360  | 30.360  | 30.360  |
| 28/04/2011-27/05/2011 | 2.2636 | 2.3466 | 440 | 36.520  | 36.520  | 36.520  |
| Total                 |        |        |     | 329.384 | 329.384 | 329.384 |

$$EG_y = EG_{\text{export},y} - EG_{\text{import},y} = 81,934.924 \text{ MWh} - 329.384 \text{ MWh} = 81,605.540 \text{ MWh}$$

$$BE_y = EG_y * EF_y = 81,605.540 \text{ MWh} \times 0.880 \text{ tCO}_2\text{e/MWh} = 71,812 \text{ tCO}_2\text{e}$$

## E.2. Project emissions calculation

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Being a wind power project, there are no project emissions according to the ACM0002 methodology. There was no fossil fuel consumption by the project for electricity generation during the monitoring period.

## E.3. Leakage calculation

>>

The leakage from the project is zero.

## E.4. Emission reductions calculation / table

>>

$$BE_y = 71,812 \text{ tCO}_2\text{e}$$

$$PE_y = 0$$

$$L_y = 0$$

$$ER_y = BE_y - PE_y - L_y = BE_y - 0 - 0 = BE_y = 71,812 \text{ tCO}_2\text{e}$$

Emission reduction generated in the monitoring period: **71,812 tCO<sub>2</sub>e**

## E.5. Comparison of actual emission reductions with estimates in the CDM-PDD

>>

| Item                                     | Values applied in ex-ante calculation of the registered CDM-PDD | Actual values reached during the monitoring period |
|------------------------------------------|-----------------------------------------------------------------|----------------------------------------------------|
| Emission reductions (tCO <sub>2</sub> e) | 84,130                                                          | 71,812                                             |

## E.6. Remarks on difference from estimated value

>>

In conclusion, from 28/05/2010 to 27/05/2011, just 1 year, the ERs accomplished is 71,812 tCO<sub>2</sub>e, which is 85% of the estimated annual ER in PDD. According to the registered PDD, the estimated annual ERs are 84,130 tCO<sub>2</sub>e. In comparison, the actual emission reductions in this monitoring period are lower than the estimates in the registered PDD due to the actual wind source variation compared with that in FSR.

### ----- History of the document

| Version                                                                                                          | Date                           | Nature of revision |
|------------------------------------------------------------------------------------------------------------------|--------------------------------|--------------------|
| 01                                                                                                               | EB 54, Annex 34<br>28 May 2010 | Initial adoption.  |
| <b>Decision Class:</b> Regulatory<br><b>Document Type:</b> Guideline, Form<br><b>Business Function:</b> Issuance |                                |                    |