
**Assessment Opinion
on Postregistration Changes Request:
Correction and Permanent changes from
the registered monitoring plan or
monitoring methodology**

Samdal Wind Power Project (4661)

**Report No. CDM00422PRC
Version No. 01**

1 INTRODUCTION

Deloitte-TECO has been performing the first verification of “Samdal Wind Power Project (4661)” (the first monitoring period: 1 July 2011 – 30 June 2013) in the Republic of South Korea.

On-site visit was implemented on 5 and 6 September 2013, and Deloitte-TECO found some corrections and differences to the project information in the registered PDD, completed on 28 January 2011, version 5. The details of the corrections and permanent changes from the registered monitoring plan or monitoring methodology are described in the following sections.

Deloitte-TECO assessed the Post registration changes after the on-site assessment and prepared this assessment opinion for approval of Post registration changes of correction and permanent changes from the registered monitoring plan or monitoring methodology according to the “Clean Development Mechanism Validation and Verification Standard (CDM-VVS : ver.05 CDM-EB65-A04-STAN)” and relevant documents.

2 TYPES OF CHANGES

2.1 Correction

Some typos were identified in the registered PDD during the verification.

- i) There were two different combined margin of emissions factor (EF_y) values identified in the registered PDD, (0.6351 tCO₂/MWh at B.6.2 and 0.6102 tCO₂/MWh at other parts of the PDD).
- ii) There were two technical specifications of the wind power equipment identified, which were different from the ones in the registered PDD.

2.2 Permanent changes from the registered monitoring plan

The monitoring plan of the registered PDD was different from the actual implementation for the following points: i) EG consumption meter accuracy, ii) EG consumption meter calibration frequency, and iii) some incorrect descriptions of electricity meters.

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- i) Deloitte-TECO confirmed one EG consumption meter (Serial No. 9000062) with accuracy class of $\pm 0.5\%$. Accuracy of the EG consumption meter was inconsistent with that of the registered PDD, in which accuracy was demonstrated as $\pm 0.2\%$.
- ii) Deloitte-TECO identified that the PP cannot control the EG consumption meter calibration frequency, which was planned to implement for at least once in three years in the monitoring plan of the registered PDD.
- iii) Deloitte-TECO identified that the number of meters and location of meters were not clearly described in the registered PDD.

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3.1 Correction

- i) Two “Combined margin of emission factor ($EF_{\text{grid, CM, y}}$)” values in the registered PDD
There are two different “Combined margin of emission factor ($EF_{\text{grid, CM, y}}$)” values in the registered PDD, “0.6351 tCO₂/MWh” (at B.6.2) and “0.6102 tCO₂/MWh” (other parts of the PDD).

Deloitte-TECO confirmed that this project had two “Operating margin of emission factor” to decide “Combined margin of emission factor”, one is EF_{OM} for Main land of South Korea and another is EF_{OM} for Main land of South Korea and Jeju Island, because this project is located in Jeju Island.

The two EF_{OM} are different because no electricity is transferred between Jeju Island and Main land of South Korea. For the final version of Validation Report and PDD, the PP decided to use more conservative EF_{OM} value (lower value).

All EF values are calculated and demonstrated in the registered documents in the project information website*. During the validation period, PDD author because confused when using the two “Combined margin of emission factor” in the registered PDD.

Deloitte-TECO confirmed by reviewing relevant documents that “Combined margin of emission factor” of 0.6102 tCO₂/MWh is correct to calculate “Annual estimation of emission reductions” of 54,276 tCO₂/yr in the registered PDD.

Deloitte-TECO concluded that the correction does not affect the design of project activity.

- ii) Different technical specification of components

* <http://cdm.unfccc.int/Projects/DB/DNV-CUK1302063875.34/view>

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Deloitte-TECO confirmed all technical specifications of the wind power equipment during on-site assessment and identified the actual technical specification of some components are inconsistent with those of the registered PDD.

Table 1. The technical specification of components

| | The values in the registered PDD | Actual values verified during the on-site assessment |
|--------------------------|------------------------------------|--|
| Operational interval | 8.6 – 18.4 rpm | 9.9 – 18.4 rpm |
| Rated output (Generator) | 3,000kW | 3,060kW |
| Gear Box | Two Planetary/helical three stages | One Planetary/helical three stages |

Actual values were confirmed by installed wind power equipment at the Samdal wind power plant. Deloitte-TECO confirmed that all the equipment of the project was installed before 27 September 2009, and validation process was implemented almost one-and-a-half years later. There was no equipment change after the installation; thus, those values were still available during the validation process. Deloitte-TECO confirmed by reviewing documentary evidence (Appendix 1) and performing interviews with the PP that those component values were adjusted during the installation but those adjusted values did not affect the total capacity of wind turbine-generator unit, 33MW (3MW X 11 units). Regarding the Rated output of generator, it was confirmed by the PP that the manufacturer, VESTAS, provided 2% bigger capacity of generator to prevent the wind power unit from stopping or damaging in case the electricity is generated over 3,000kW under the higher wind velocity. It was also confirmed by the PP that there was no equipment price change for the adjustment.

Even though the rated output of Generator was increased, the total capacity of wind turbine-generator unit was not increase without increase of rated output of turbine. Thus this adjustment did not affect the project design, such as scale, additionality.

Deloitte-TECO concluded that the Post Registration change for corrections were conducted with a request for issuance without the need for prior approval by the board based on Appendix 1 of CDM PS.

3.2 Permanent changes from the registered monitoring plan

Deloitte-TECO identified that some facts the are different from the registered PDD and validated as followings:

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i) EG consumption meter accuracy

Deloitte-TECO confirmed by reviewing the relevant documents, such as PPA and KEPCO's internal client meter data, and performing the interview with the PP that the EG export meters are owned and controlled by the PP, while the EG consumption meter is owned and controlled by the power grid, KEPCO. The PP cannot choose the accuracy of EG consumption meter.

Deloitte-TECO confirmed the compliance of the meter accuracy against local/national standard of South Korea. According to "Power market operation regulations" (Appendix 2) of South Korea, if equipment capacity is from 500 kW to 10,000 kW, the electricity meter with higher accuracy than $\pm 1.0\%$ has to be used. According to PPA of EG consumption, the contracted consumption of electricity is 787 kW. Therefore, the EG consumption meter accuracy of $\pm 0.5\%$ still meets the requirement of the local/national standard.

Without the meter accuracy difference, there is no change of the monitoring system; therefore, the changed monitoring plan is still in compliance with the applied methodology and the level of the monitoring system was not reduced where compared with the registered monitoring plan.

ii) Calibration frequency of EG consumption meter

As mentioned above, the EG consumption meter is under the control of the power grid, KEPCO. During the on-site assessment, Deloitte-TECO confirmed that the EG consumption meter was internally calibrated. According to the KEPCO internal data for installed EG consumption meter (Serial no. 900062), the current meter was installed on 11 April 2011, which is before the starting date of the crediting period. The latest calibration of the meter was implemented on 27 September 2011, by a third party. Based on the monitoring plan of the registered PDD, it was stated, "the meters shall be calibrated when they are installed, and recalibrated every three years after the installation." Therefore, calibration frequency of consumption meter is kept for this monitoring period in accordance with the monitoring plan.

However, regarding the calibration frequency under the KEPCO's internal regulation, Deloitte-TECO additionally confirmed by reviewing the official notification from

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KEPCO (Appendix 3) and performing the interview with the PP that the internal regulation was changed to be effective from year 2013. The details are as follows:

Table 2 Revision point of internal calibration regulation of KEPCO

| Previous (to 2012) | | After revision (from 2013) | |
|--------------------|-----------------|----------------------------|--|
| More than 1,000 kW | Once/year | More than 1,000kW | - For industry and general: Once/year - For residential, education, and street light: Once/two years |
| 100 kW – 999 kW | Once/two years | | |
| Less than 100 kW | Once/four years | Less than 1,000 kW | - New meter operated from the previous year - Changed meter or changed accessories - Meter has difference of more than 30% electricity usage |

According to the above Table 2, the PP cannot guarantee to keep the calibration frequency of EG consumption meter at least once in three years from the next monitoring period per the registered PDD. Additionally, Deloitte-TECO confirmed that the valid period for the authorized certification is seven years based on the national regulation of “Measures Act.” (Appendix 4). In the “Measures Act” some meters, such as Edition Manual scales, are required to implement calibration inspections every two years. However, the electricity meter does not fall into this category. Therefore, the installed meters in Samdal Wind Power Project do not need to be calibrated every two years under the national regulation. Accordingly, Deloitte-TECO concluded that the calibration frequency of consumption meter change from once in three years to seven years is appropriate under the circumstances.

iii) Incorrect description of meters (Number of installed meters)

For the description of section B.7.1 of the registered PDD, it was described that “Main meter is installed at substation” at EG_{export,y} table and “the meter are bidirectional, which can record the import and export electricity generation” at EG_{consumption,y} Table. Deloitte-TECO confirmed that two EG export meters are installed to measure electricity supplied to the power grid, main meter and submeter. Those meters were already mentioned in the registered validation report and it was stated in the CDM monitoring manual that the submeter will be used to measure electricity value to supply to the power grid in case the main meter malfunctions. In the local/national standards, according to “Power market operation regulation”, Deloitte-TECO confirmed that in case of installing generator, which has more than 20MW capacity, the comparable measuring equipment has to be installed to serve as a backup meter in this project activity. In order to describe the PP’s monitoring system more clearly, submeter for EG

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export was added to the revised monitoring plan of the PDD. Regarding description of EG consumption, y, in the registered PDD that “ the meter are bidirectional, which can record the import and export electricity generation”, it may seem that one meter measures both import and export electricity generation. In order for a more clear description, the PP changed the sentence based on the actual implementation. Deloitte-TECO confirmed by conducting an on-site assessment that the revised descriptions are more clear to demonstrate the PP’s monitoring system to prevent confusion for the future monitoring period.

Deloitte-TECO confirmed that the EG consumption meter accuracy, calibration frequency, and some incorrect descriptions of the monitoring system did not affect the monitoring plan and monitoring results, thus concluded that the Post registration changes for permanent changes from the registered monitoring plan or monitoring methodology were conducted with a request for issuance.

Deloitte-TECO concluded that the correction and permanent changes from the registered monitoring plan did not affect the design of project activity, accuracy level of monitoring plan based on the applied methodology and local/national standards. Therefore, Deloitte-TECO concluded that the Post-Registration changes for corrections and permanent changes from the registered monitoring plan were properly conducted with the request of issuance without the need for prior approval by the board based on Appendix 1 of CDM PS.

26 December 2013



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Relevant Documents

Appendix 1: Notification of the result of the test before use

Appendix 2: Power market operation regulations

Appendix 3: Revision point of internal calibration regulation of KEPCO

Appendix 4: Measures Act