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## CDM Executive Board

### RESPONSE TO REQUEST FOR REVIEW

Request for issuance "NorthWind Bangui Bay Project " (0453)

AENOR has performed the verification of "NorthWind Bangui Bay Project" No. 0453 located in Philippines, for the period 1<sup>st</sup> September 2006 – 25<sup>th</sup> August 2007. The request for issuance of CERs was made on 11/07/2008.

Three requests for review have been issued, which are identical to each other. The communication of this request for review was received on 07/08/2008.

We thank the CDM Executive Board and the Secretariat for giving us the opportunity to clarify about our considerations in the verification of NorthWind Bangui Bay project for the period mentioned.

Please find below AENOR response to the issues raised by the request for review.

#### Request for review:

**"The methodology requires measurement of electricity generation while the electricity generated in September 2006 in the spreadsheet was calculated. Further clarification is required on how the DOE verified the electricity generation data in September 2006 in accordance with the methodology and further information is required on the measured value of electricity generation in September 2006 to be crosschecked with the invoice value."**

As a previous step to the response, and in order to provide further information and clarification regarding the key issues in the verification of NorthWind Bangui Bay project for the period 1<sup>st</sup> September 2006 – 25<sup>th</sup> August 2007, AENOR has prepared a summary of these key issues:

- a) Companies involved in the activity of NorthWind Bangui Bay, due to the verification of project activity emissions reductions.
- b) Electricity generation measuring and control systems.
- c) Electricity generation data registry.
- d) Power bills issued.
- e) Electricity generation reports.

After this summary, the response to the issues raised by the request for review, divided in different answers to the two different questions identified by AENOR in the request of review, is provided

## Summary of key issues in the verification of NorthWind Bangui Bay project for the period 1<sup>st</sup> September 2006 – 25<sup>th</sup> August 2007.

### **a) Companies involved in the activity of NorthWind Bangui Bay, due to the verification of project activity emissions reductions**

a.1) North Wind Power Development Corporation (hereafter **NorthWind**). Project participant and owner of the North Wind Bangui Bay wind power plant.

NorthWind North Wind Bangui Bay Project is a 33 MW (Phase I 24.75 MW and Phase II 8.25 MW ) wind power plant consisting of 20 wind turbine towers (15 built at date of first periodic verification and the remaining 5 under construction at date of second periodic verification), a switchyard and a control station, located in the Ilocos Norte Region of Philippines. This power plant evacuates the electricity to the grid in the substation of Laoag, situated 60 km from the plant.

a.2) National Transmission Corporation (hereafter **TRANSCO**). Governmental company responsible of the transmission of energy. Responsible for the metering equipments and measurements in the interconnection substation of Laoag.

a.3) National Power Corporation (hereafter **NPC**). Responsible of the billing in the Region of Ilocos Norte up to December 2006

a.4) Ilocos Norte Electric Cooperative (hereafter **INEC**). Responsible for the local distribution of the electricity.

a.5) Wholesale Electricity Spot Market (hereafter **WESM**). Since November 26, 2006, NorthWind participated in the WESM. The WESM administrator is TRANSCO

### **b) Electricity generation measuring and control systems.**

b.1) NorthWind electricity measuring and control system.

NorthWind Bangui Bay plant has a computer software metering system (SCADA) to control the energy generated. This system measures data obtained instantaneously and logs the average every ten minutes in the data bank. SCADA data are not used for official documents but for reference or for internal purposes only.

There is also a totalizer equipment to measure the gross energy generated daily by the plant before the evacuating line, and this data is used to compare with the quantities delivered at the Laoag substation (see **Annex 2 “NorthWind daily generation data September 2006”**).

b.2) Interconnection (TRANSCO Laoag substation) measuring and control system.

At the interconnection substation of Laoag (separate 50 km. from NorthWind plant) there are three meters. An official meter used to the official billing, and a back-up meter. Those meters are maintained by TRANSCO and also used to make the TRANSCO Annual Summary of Power Generation (see **Annex 4. “TRANSCO annual summary of power generation from NorthWind plant”**).

There is a third meter owned by INEC and used as internal counter-check for its purposes.

## **c) Electricity generation data registry.**

c.1) At NorthWind plant there are two types of data registers, one coming from the software system logging each ten minutes, and another coming from the totalizer with the gross energy generated daily. (see Annex 2). Those registers represent the gross generation of the facility, and are used for its internal control.

c.2) The billing system practiced in the Philippines is monthly, and TRANSCO does not read the official billing meter on a daily basis. TRANSCO does the reading of the meters at the substation of Laoag the 25<sup>th</sup> of each month and makes an annual summary of power generation (see Annex 4)

c.3) NPC does the reading of the meters in the same way as TRANSCO does. Some times is possible to find different values for the same generation between the mentioned sources, as the measurements are taken at different hours the same day.

c.4) Since 26<sup>th</sup> November 2006, NorthWind's generation is registered in the basis of its hourly and daily delivery to the system and registered by the official meter situated at the interconnection substation of Laoag, due to its participation in WESM. TRANSCO performs these measurements.

## **d) Power bills issued**

d.1) Clarifications about the power bills issued in Philippines.

The billing system practiced in the Philippines is monthly, as TRANSCO and NPC do not read the official electricity metering systems on a daily basis. TRANSCO and NPC perform only one registration of the electricity delivered by electricity generators at the interconnection points, usually on 25<sup>th</sup> day of each month.

Then, the billing period comprises from the 26<sup>th</sup> of one month to the 25<sup>th</sup> of the following month.

This reading and registration system has applied to NorthWind Bangui Bay until 25<sup>th</sup> November 2006, as on 26<sup>th</sup> November 2006 NorthWind Bangui Bay started its participation in the wholesale electricity spot market -WESM-, and then the monthly power bill regarding the generation of NorthWind is based on a hourly/daily registration performed by TRANSCO

d.2) Power bills issued by NPC

Each month NPC issued a power bill to INEC, where it was detailed the generation of several zones of Ilocos Norte's region and it was included the total generation of NorthWind wind farm. The invoice for the billing period 26<sup>th</sup> August 2006 – 25<sup>th</sup> September 2006 appears at **Annex 3 “National Power Corporation Power Bill”**.

This invoice reflects the total energy evacuated to the grid by NorthWind at the Laoag interconnection substation (see Annex 3, second page, mentioned as *Gross Gen*). Due to an agreement between NorthWind and NPC, from the basis of the mentioned *Gross Gen*, a discount is performed as a financial contribution of NorthWind to the transmission line loss at INEC's Currimao substation (see Annex 3, second page, mentioned as *T/L loss share for Currimao*) That substation is placed far away from TRANSCO Laoag interconnection substation, and in the side of the distribution company (INEC).

The difference between the Gross Gen and the mentioned discount, makes what is stated in the NPC power bill as "Net Generation of NORTHWIND" (see Annex 3, second page, right side, mentioned as "Remarks: Net Generation of NORTHWIND").

It is remarkable that, as explained above, what appears at NPC power bill as **Gross Gen** is in fact the net generation of NorthWind measured at the official control system at Laoag interconnection substation (see point b) Electricity generation measuring and control systems, at this response), and what appears at NPC power bill as **Net Generation of NORTHWIND** is the generation considered to calculate the "Total Amount Due" expressed in PHP (Philippines Pesos)

This fact was verified by the verification team of AENOR during the on-side assessment, by means of a meeting hold on 23<sup>rd</sup> April 2008 at Laoags interconnection substation with responsible persons of TRANSCO and INEC.

As well, it is remarkable that this billing system is no longer used from December 2006 billing period (November 26<sup>th</sup> to December 25<sup>th</sup>), as on November 26<sup>th</sup> NorthWind started its participation in the WESM.

#### d.3) Power bills issued by NorthWind

Each month NorthWind issued a power bill to INEC, where the generation considered to calculate the remuneration is the quantity of kWh stated at NPC power bill as "Net Generation of NORTHWIND", as NorthWind shall consider the mentioned agreement with NPC.

This agreement is no longer effective from 26<sup>th</sup> November 2006, and the billing system since then is based in the daily generation delivered by NorthWind at the the Laoag interconnection substation, as both INEC and NorthWind participate in the WESM.

The invoice for the billing period 26<sup>th</sup> August 2006 – 25<sup>th</sup> September 2006 appears at **Annex 5 "NorthWind Power Bill"**.

#### e) Electricity generation reports.

e.1) **Annex 1 "Energy Generation and Estimated CERs Table for the 2nd crediting Period"**. This table is created with the data from the energy delivered to the grid measured at the Laoag substation and registered at the NPC bills (for September 2006 see Annex 3)

e.2) NorthWind daily gross generation registered at the totalizer in the power plant (see Annex 2)

e.3) TRANSCO annual summary of power generation from NorthWind plant registered at the interconnection substation (see Annex 4).

## **Response to the issues raised by the request for review**

Two different questions have been identified in the request for review:

- 1) “How the DOE verified the electricity generation data in September 2006 in accordance with the methodology”
- 2) “Further information is required on the measured value of electricity generation in September 2006 to be crosschecked with the invoice value”

## **Questions**

### **1) How the DOE verified the electricity generation data in September 2006 in accordance with the methodology**

The documentation provided by NorthWind at its Monitoring report contains the monthly electricity generation for the verification period 1<sup>st</sup> September 2006 – 25<sup>th</sup> August 2007. Those data are contained in the **Annex 1** of this response document, “**Energy Generation and Estimated CERs Table for the 2<sup>nd</sup> Crediting Period**”.

The sources of electricity generation, expressed in MWh, considered by NorthWind to elaborate this table are:

- For the billing months September 06, October 06 and November 06: **Gross Gen** stated at NPC power bills for those billing periods (see point d.2) Power bills issued by NPC of this response)
- For the billing months December 06 to August 07: hourly/daily generation delivered by NorthWind at the Laoag interconnection substation (as NorthWind participate in the WESM), expressed as total monthly amount due to the aggregation of hourly/daily data provided by TRANSCO

As September 2006 has an special characteristic (see point d.1) Clarifications about the power bills issued in Philippines.), the electricity generation expressed in the NorthWind “**Energy Generation and Estimated CERs Table for the 2<sup>nd</sup> Crediting Period**” for this month, is calculated from the net generation of NorthWind, directly measured at the official control system at Laoag interconnection substation by NPC.

The calculation from the directly measured electricity supplied to the grid by the project was done computing the proportionate quantity by dividing the monthly generation by 31 days (Aug 26-Sept 25) to get the average daily generation sold, then multiplying it by 25 days (Sept 01-25), resulting to 1.118,71 MWh. This electricity generation is used to do the calculation of the emission reduction of this month (September 2006).

AENOR checked and verified the calculated generation (2006 September 01-25), from the directly measured electricity supplied to the grid (2006 August 26<sup>th</sup> – 2006 September 25<sup>th</sup>). Criteria considered by the validation team of AENOR were:

- For the considered period (2006 September 01-25), there are not daily measures at the official metering system placed at Laoag interconnection substation. As mentioned in point b.2) of this response, TRANSCO and NPC only made one monthly generation registration before 26th November 2006.
- The available daily generation data for the considered period (2006 September 01-25) at NorthWind metering system shall not be used and verified as correct to elaborate the calculation, as those data represent the real gross generation of NorthWind Bangui Bay project and do not consider the transportation line loss between the facility and the Laoag interconnection substation.
- The compared data between monthly gross generation of NorthWind Bangui Bay project and generation measured by TRANSCO and NPC at the Laoag interconnection substation (referred to NorthWind) do not reflect a constant value that may be used as transportation line loss factor, in order to determinate the most accurate and/or conservative calculation method.
- Considering that only TRANSCO and NPC monthly registers (according to the billing system practiced in Philippines) reflects the directly measured electricity supplied to the grid by the project and that, due to different hours of reference, both measures differs, NPC measure for the period should be used, as is the minor of them.

The comparison among the three sources of data is provided in the next table:

	26 August -25 September	1st - 25th September
NorthWind gross generation (plant meter) (1)	1.424.482	1.325.357 (measured)
TRANSCO measurement (2)	1.388.870	1.120.056 (calculated)
NPC measurement (3)	1.387.206	1.118.715 (calculated)

All data in kWh

Source of data:

- (1) Annex 2, "NorthWind daily generation data September 2006".
- (2) Annex 4, "TRANSCO annual summary of power generation from NorthWind plant"
- (3) Annex 3, National Power Corporation "Power Bill September 2006"

## Conclusion

AENOR has verified the electricity generation data in September 2006 (1<sup>st</sup> September – 25<sup>th</sup> September), as an amount of 1.118,71 MWh. The data is obtained from the most conservative source (NPC) that registers the directly electricity supplied to the grid by the project activity at that billing period (26<sup>th</sup> August 2006 – 25<sup>th</sup> September 2006)

The method use to determinate the mentioned data is as well conservative, and has been considered in accordance with the methodology (ACM0002/Version 06)

## **2) Further information is required on the measured value of electricity generation in September 2006 to be crosschecked with the invoice value.**

According to the facts explained previously, AENOR checked the generation in September 2006 expressed by NorthWind in its monitoring report for the calculation of the emission reduction achieved in the verification period (see Annex 1), and the generation expressed in September 2006 at TRANSCO annual summary of power generation from NorthWind plant (see Annex 4), and crosschecked them with the quantity showed as Gross Generation in the NPC invoice of September, 2006, (NPC "Power Bill September 2006", see Annex 3), considering it as the most conservative information.

As there is not a valid reference of the daily generation in September 2006, and as well considering the special characteristics that represents the generation in September, 2006 (see point d.1), the NPC invoice used to make the crosscheck is the basis for the calculation of NorthWind plant generation from 1st to 26th September 2006, always using the most conservative approach.

### Conclusion

AENOR has verified the value of electricity generation in September 2006 by means of a crosscheck. Both the generation reported by NorthWind for that period and the generation measured by TRANSCO at the Laoag interconnection substation have been checked with the invoice issued by NPC

### Annexes

Annex 1: Energy Generation and Estimated CERs Table for the 2nd crediting Period. (.xls file)

Annex 2: NorthWind daily generation data September 2006 (.xls file)

Annex 3: National Power Corporation "Power Bill September 2006" (.pdf file)

Annex 4: TRANSCO annual summary of power generation from NorthWind plant (.pdf file)

Annex 5: NorthWind Power Bill September 2006 (.pdf file)