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CDM Executive Board

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Date  
24.08.2010

## Request for Revision of Monitoring Plan

“El Canada Hydroelectric Project”

CDM Registration No: 0606

Dear Sir/Madam,

Please find below the validation opinion of TÜV NORD JI/CDM Certification Program to the revision of the monitoring plan for the above mentioned project no. 0606.

If you have any questions do not hesitate to contact us.

Yours sincerely,

TÜV NORD JI/CDM Certification Program



Rainer Winter

## Validation opinion as per requirement of EB49, Annex 28

Level of accuracy or completeness

☒ TÜV NORD herewith confirms that the proposed revision of the monitoring plan ensures that the level of accuracy or completeness in the monitoring and verification process is not reduced.

Additional comment:

### Current situation

“El Canada Hydroelectric Project” (hereafter referred to as project activity) was registered on 02 December, 2006 using the baseline and monitoring methodology “Consolidated methodology for grid-connected electricity generation from renewable sources” (ACM0002, ver. 6).

The project activity is a peaking run-of-the-river project which envisages construction and operation of hydro power generating plant of 43.0 MW capacity located on the Samalá River on the west coast of Guatemala, near the town of Santa María de Jesus.

There are two meters (main and back up meter) in El Canada substation which register the net energy exported by El Canada and Montecristo hydroelectric plants, every 15 minutes. Montecristo is another hydroelectric plant of the same owner located 2 km downstream from El Canada plant. Montecristo hydroelectric plant is connected to the grid through El Canada substation. Using the same transmission line allowed the plant owner to reduce environmental impacts as well as investment costs. Montecristo hydroelectric plant has an own substation with two meters (main and back up meter) which registers the net energy generated by Montecristo hydroelectric plant only.

There is one Project Manager who is responsible for both hydroelectric plants to collect, record, and monitor the electricity generation. The Project Manager verifies the measurements of both meters and collects the electricity data from the energy meters installed in El Canada substation and in Montecristo substation. All meters from both plants measure the net electricity generation. The electricity generation data is reported in a spreadsheet for measuring control and register. A CDM Coordinator receives the information from the Project Manager and calculates the net electricity produced and delivered to the grid by El Canada hydroelectric project through subtraction of the net electricity measured in Montecristo substation from the net electricity measured in the El Canada substation. Then the CDM Coordinator calculates the emission reductions and elaborates the Monitoring Report for every monitoring period.

After this, an invoice is issued to Comegsa (Commercial distributor). Besides, AMM (Wholesale Market Administrator) has an interface directly with the electricity meters and verifies the electricity generation and supply to the grid. AMM can issue a certificate of electricity measurement when demanded by GdO (Generadora de Occidente). Thus, this document is an important evidence of independent third party cross-checking of the measurement.

The project participant is required to revise the monitoring plan as per the CAR P1 raised in the course of the second periodic verification for the monitoring period 2007-07-01 to 2008-12-31.

*CAR P1: Determination of  $EG_y$  is not in line with the monitoring methodology applied (ACM0002, ver. 6) as the electricity supplied to the grid by the project is not directly measurement but calculated. The deviation shall be addressed to UNFCCC. Moreover the information provided in the monitoring report shall be corrected accordingly. Additional information is also required regarding the backup system of the meters installed at the plant site.*

In line with the paragraph 57 of the modalities and procedures for the CDM which allows project participants to revise monitoring plans to improve accuracy and completeness of information and also the requirements mentioned under paragraph 17 and 18 of Clean Development Mechanism Validation

and Verification Manual (VVM) (EB-51, Annex 3), the DOE is validating the detailed procedure for the monitoring parameters “Net Electricity supplied by the project to the grid (EG<sub>y</sub>)”, “Net electricity supplied to the grid by both EI Canada and Montecristo plants (E1)” and “Net electricity supplied to the grid by Montecristo Hydroelectric Plant (E2)” (section D.2.1.3 of the PDD) in the proposed revised monitoring plan and hence requesting revision of the monitoring plan.

The documents and evidences in relation to monitoring of the net electricity generated and delivered to the grid by the installed 43.0 MW hydro electric plant were verified by DOE during site visit for the Monitoring Period (2007-07-01 to 2008-12-31).

#### Revision of the monitoring plan

The parameters whose recording method and backup system are revised in the section ‘D’ of the registered PDD are as follows:

ID number (Please use numbers to ease cross-referencing to table D.3)	Data variable	Source of data	Data unit	Measured (m), calculated (c), estimated (e),	Recording Frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment
1	Net electricity supplied to the grid by both EI Canada and Montecristo Plants (E1)	GdO	MWh	(m)	monthly	100%	Electronic and paper. Data will be archived during the crediting period and 2 more years.	Official metering data sent monthly to the AMM *. Invoices to the final buyer COMEGSA have to match official metering data to AMM. There is one principal meter and back meter installed in the EI Canada substation. The back-up meter readings will be used in case of problems with the main meter and also to cross check with the principal meter readings. The meters are calibrated as per the requirements of the norm ANSI C12.20.
2	Net electricity supplied to the grid by Montecristo Hydroelectric Plant (E2)	GdO	MWh	(m)	monthly	100%	Electronic and paper. Data will be archived during the crediting period and 2 more years.	Official metering data sent monthly to the AMM *. Invoices to the final buyer COMEGSA have to match official metering data to AMM. There is one principal meter and back meter installed in the Montecristo substation. The back-up meter readings will be used in case of problems with the main meter and also for cross checking the principal meter readings. The meters are calibrated as per the requirements of the norm ANSI C12.20.

3	Net electricity supplied by the project to the grid (EGy)	GdO	MWh	(c)	Monthly	100%	Electronic and paper. Data will be archived during the crediting period and 2 more years.	The net electricity supplied by the project to the grid is calculated based on the difference between the meter readings of E1 and E2. Hence, $EGy = E1 - E2^*$ .
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\*El Canadá Hydroelectric plant is located 2 km upstream from Montecristo plant. The electricity produced by the Montecristo Hydroelectric plant is transformed from 13.8 kV to 69 kV in an own substation and then is delivered to the 69 kV busbar of El Canadá Substation, through a 69 kV line, whose length is of 2.8 km. The reason of the connection of Montecristo power plant to the grid, through El Canadá substation, was to reduce investment costs using the same line to export the electricity from El Canadá substation to the grid and to reduce the environmental impacts.

Each power plant has its own electricity meter to read the net electricity supplied to the grid, El Canadá Electricity Meter is located in the 69 kV busbar of El Canadá Substation and the Montecristo Electricity Meter is located in the 69 kV busbar of Montecristo Substation. The 69 kV busbar of El Canadá Substation was chosen as the sale busbar for both plants, but the net electricity supplied to the grid by each plant is commercialized separately and in different way in the electricity market.

The monthly net electricity supplied to the grid will be collected from the commercial energy meter installed in the El Canada Substation (installed on 19 November 2003), which measures the net electricity supplied by both El Canada Hydroelectric Project and Montecristo Hydroelectric Projects and in the Montecristo Substation in the 69 KV bus which measures net electricity supplied to the grid by the Montecristo Hydroelectric Project alone (installed on 14 May 2006 and started supplying to the grid from the same month through El Canada substation meter, evidence for the same submitted to DOE), therefore the net electricity supplied by the El Canadá Hydroelectric Project will be calculated by the difference.

Net electricity supplied by the project activity to the grid (EGy) = Meter reading at El Canada Hydro 69 kV substation – Meter reading at Montecristo 69 kV substation.

The generation data is reported in a spreadsheet for measuring control and register. The commercial meter data collection of the monitored month takes place during the first week of the following month.

<b>D.3. Quality control (QC) and quality assurance (QA) procedures are being undertaken for data monitored</b>		
<i>Data (Indicate table and ID number e.g. 3.-1.; 3.2.)</i>	<i>Uncertainty level of data (High/Medium/Low)</i>	<i>Explain QA/QC procedures planned for these data, or why such procedures are not necessary.</i>
D.3.1. Net Electricity supplied to the grid by El Canada and Montecristo Plants	Low	There is one principal and backup meter. The Serial number of the principal meter - PT-0511A048-0; For the back-up meters: Serial Number is 85 762 983. The meters are calibrated yearly to fulfill the requirements of the norm ANSI C12.20. Official metering data will be sent monthly to the AMM. Invoices to the final buyer COMEGSA will have to match the official metering data to AMM.
D.3.2. Net Electricity supplied to the grid by Montecristo Hydroelectric Plant	Low	There is one principal and backup meter. The Serial number of the principal meter - PT-0511A045-000; For the back-up meters: Serial Number is 85 762 982. The meters are calibrated yearly to fulfill the requirements of the norm ANSI C12.20. Official metering data will be sent monthly to the AMM. Invoices to the final buyer COMEGSA will have to match the official metering data to AMM.
D.3.3 Net Electricity supplied by the project to the grid (EGy)	Low	Calculated based on the readings of meters installed for parameters D3.1 and D3.2.

According to the NCC-14 clause 14.12 "Periodic Verifications" the principal and supporting meters need to be checked every year for the fulfillment of the requirement of the Administrador del Mercado Mayorista, AMM (Wholesale Market Administrator) or of the manufacturer. Generadora de Occidente, Ltda. Every as per the requirements of the norm ANSI C12.20. The meters are certified by a company that is approved by the AMM.

Also Generadora Montecristo, S.A. as same of Generadora de Occidente, Ltda. every year proceed to the calibration of the meters of energy, the principal meter and the support meter; in order to verify that the meters fulfill the requirements of the norm ANSI C12.20. The meters were certified by a company that is approved by the AMM.

#### Assessment of the revisions

**Net electricity supplied to the grid by both El Canada and Montecristo Plants (E1):** there is a main and back up meter located in El Canada substation which measures the net electricity generation of El Canada and Montecristo Plants. Both meters are calibrated as per the requirements of the norm ANSI C12.20. Calibration certificates were provided by the PP to the verification team. No discrepancies were identified. Furthermore invoices were also checked against the measures from the meters. No discrepancies were identified. The meters were installed at the El Canada substation on 2003/11/19 as confirmed by Administrador del Mercado Mayorista-AMM (Reference ME-169-2010).

**Net electricity supplied to the grid by Montecristo Hydroelectric Plant (E2):** there is a main and back up meter located in Montecristo substation which measures the net electricity generation of Montecristo Plant. Both meters are calibrated as per the requirements of the norm ANSI C12.20. Calibration certificates were provided by the PP to the verification team. No discrepancies were identified. Furthermore invoices were also checked against the measures from the meters. No discrepancies were identified. The meters in Montecristo plant were installed on 2006/05/14 (Confirmation by AMM, Reference ME-170-2010), which is the day when the Montecristo plant started to deliver electricity through the El Canda Substation. Properly evidence was checked (Certificate of Measurement, by AMM, Reference ME-139-2010).

**Net electricity supplied by the project to the grid (EGy):** the net electricity supplied by the project to the grid is calculated based on the joint net electricity generation of El Canada + Montecristo hydroelectric plants minus the net electricity generation of Montecristo hydroelectric plant. Both measures are performed by calibrated meters, no discrepancies were identified. Potential transmission losses between Montecristo substation and El Canada substation are not considered. Thus, the value for electricity generation of Montecristo hydroelectric plant is conservative.

There is a complete operational and management structure established for the project activity, such as data collection, recording and storage systems. Responsibilities are also described. As both hydropower plants are owned by the same company, availability of data is guaranteed. The validation team has assessed all arrangements to assure certainty in all measures.

A complete description for determining the baseline of anthropogenic emissions by sources of GHGs within the project boundary and how such data will be collected and archived are mentioned in the revised section D.2.1.3 and D.3 of the PDD, amongst others calibration requirements and frequency of measurements. Adequate quality control mechanisms like internal data control and cross check with invoices are implemented. Therefore it can be concluded that the level of accuracy and completeness in the monitoring and verification process is not reduced as a result of this revision. The proposed revision in the monitoring plan does not impact the estimation of emission reductions for the proposed activity.

<p>Accordance with approved monitoring methodology</p> <p><input checked="" type="checkbox"/> TÜV NORD herewith confirms that the proposed revision of the monitoring plan is in accordance with the approved monitoring methodology applicable to the project activity.</p> <p><i>Additional comment:</i></p> <p>The net electricity supplied to the grid by the project activity can not be measurement directly as there is only a joint meter available. A separation of the metering system is considered disproportional due to the high costs for the construction of a new power line. Nevertheless, as the net electricity supplied to the grid by the project activity is determined based on directly measured data and as the monitoring plan including the measurement method and procedure as well as the QA/QC procedures for both plants is considered adequate, the validation team came to the conclusion that the proposed revision meets the requirements stipulated in the approved monitoring methodology ACM0002, version 06. The conservativeness in the monitoring and verification process and of the ER calculation is maintained.</p>
<p>Previous verification findings</p> <p><input type="checkbox"/> TÜV NORD herewith confirms that the findings of previous verification reports, if any, have been taken into account.</p> <p><input checked="" type="checkbox"/> No findings from previous verification period had to be considered.</p> <p><i>Additional comment:</i></p> <p>The previous verification was conducted by another DOE. No related findings were addressed in the previous verification report. The need of revising the monitoring plan has been identified in the course of the second periodic verification for the monitoring period 2007-07-01 to 2008-12-31. A corresponding CAR has been raised (see above).</p>