



VALIDATION REPORT SAN CARLOS BIOPOWER INC.

VALIDATION OF THE SAN CARLOS 18 MW BIOPOWER POWER PLANT

REPORT No. PHILIPPINES-VD/003/2012

REVISION No.01

BUREAU VERITAS CERTIFICATION

62/71 Boulevard du Château
92571 Neuilly Sur Seine Cdx - France



VALIDATION REPORT

Date of first issue: 12/12/2012	Organizational unit: Bureau Veritas Certification Holding SAS
Client: San Carlos Biopower Inc.	Client ref.: Mr. Juan Xavier P. Zabaleta

Summary:

Bureau Veritas Certification has conducted the validation of San Carlos 18 MW Biopower Power Plant, owned by San Carlos Biopower, Inc., which is located in Barangay Palampas, San Carlos Ecozone, San Carlos City, Negros Occidental, Philippines, on the basis of UNFCCC criteria for the CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM rules and modalities and the subsequent decisions by the CDM Executive Board, as well as the host country criteria.

The validation scope is defined as an independent and objective review of the project design document, the project's baseline study, monitoring plan and other relevant documents, and consisted of the following three phases: i) desk review of the project design document and additional background documents; ii) follow-up interviews with project stakeholders; iii) resolution of outstanding issues and the issuance of the final validation report and opinion. The overall validation, from Contract Review to Validation Report & Opinion, was conducted using Bureau Veritas Certification internal procedures.

The first output of the validation process is a list of Clarification Requests, Corrective Actions Requests, and Forward Actions Requests (CLs, CARs and FARs), presented in Appendix A. Taking into account this output, the project proponent revised its project design document.

In summary, it is Bureau Veritas Certification's opinion that the project correctly applies the baseline and monitoring methodology ACM 0018, Version 02.0.0 and meets all relevant UNFCCC requirements for the CDM and the relevant host country criteria. Bureau Veritas Certification thus requests the registration of the project as a CDM project activity.

Report No.: Philippines-VD/003/2012	Subject Group: CDM
Project title: San Carlos 18 MW Biopower Power Plant	
Work carried out by: Mr. Ram Desai - Team Leader Mr. Adarne Crispo - Team Member Mr. Jason Russell Aguilar – Local Financial Specialist	
Internal Technical Review carried out by: Mr. Nguyen Hong Linh	
Date of this revision: 29/12/2012	Rev. No.: 01
Number of pages: 122	

Indexing terms

Work approved by:

Flavio Gomes

☒ No distribution without permission from the Client or responsible organizational unit

☐ Limited distribution

☐ Unrestricted distribution



Abbreviations

BVCH	Bureau Veritas Certification Holding SAS
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reductions
CL	Clarification Request
CO2	Carbon Dioxide
CO2e	Carbon Dioxide Equivalent
CTS	Current Tree Stands
DENR	Department of Environment and Natural Resources
DOE	Designated Operational Entity
DoE	Philippine Department of Energy
ECC	Environmental Clearance Certificate
ECP	Energy Crop Plantation
FAR	Forward Action Request
GHG	Green House Gas(es)
IEE	Initial Environmental Examination Report
MoV	Means of Verification
MP	Monitoring Plan
PDD	Project Design Document
PLF	Plant Load Factor
PP	Project Participant
PPA	Power Purchase Agreement.
SCBP	San Carlos Biopower Inc.
UNFCCC	United Nations Framework Convention on Climate Change
VVS	Validation and Verification Standard

Table of Contents	Page
1. INTRODUCTION	5
1.1. Objective	5
1.2. Scope	5
1.3. Validation Team	5
2. METHODOLOGY	6
2.1. Review of Documents	6
2.2. Follow-up Interviews	6
2.3. Resolution of Clarification, Corrective and Forward Action Requests	7
2.4. Internal Technical Review	8
3. VALIDATION CONCLUSIONS	8
3.1. Approval (43-44)	9
3.2. Authorization (49)	9
3.3. Sustainable Development (52)	9
3.4. Modalities of Communications (58,61)	9
3.5. Project Design Document (63)	10
3.6. Changes in the Project Activity (17)	10
3.7. Project Description (69)	20
3.8. Baseline and Monitoring Methodology	23
3.8.1. Applicability of the selected Methodology (77)	23
3.8.2. Project Boundary (86-87)	26
3.8.3. Baseline Identification (94-95)	28
3.8.4. Algorithms and/or Formulae used to determine Emission Reductions (99-100)	31
3.9. Additionality (104)	41
3.9.1. Prior consideration of the Clean Development Mechanism (112)	42
3.9.2. Identification of Alternatives (116)	43
3.9.3. Investment Analysis (123)	43
3.9.4. Barrier Analysis (127)	47
3.9.5. Common Practice Analysis (130)	48
3.10. Monitoring Plan (133)	50
3.11. Environmental Impacts (137)	54
3.12. Local Stakeholder Consultation (140)	54
4. COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS	56
5. VALIDATION OPINION	57
6. REFERENCES	58
7. CURRICULA VITAE OF THE DOE'S VALIDATION TEAM MEMBERS	63
APPENDIX A: SAN CARLOS 18 MW BIOPOWER POWER VALIDATION PROTOCOL	65



1. INTRODUCTION

San Carlos Biopower Inc. has commissioned Bureau Veritas Certification to validate its CDM project San Carlos 18 MW Biopower Power Plant (hereafter called “the Project”) at Barangay Palampas, San Carlos Ecozone, San Carlos City, Negros Occidental, Philippines.

This report summarizes the findings of the validation of the Project, performed on the basis of UNFCCC criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

1.1. Objective

The objective of a validation is to provide a thorough and independent third party assessment of the project design. In particular, the project's baseline, the monitoring plan, and the project's compliance with relevant UNFCCC and host country criteria are validated in order to confirm that the project design, as documented, is sound and reasonable, and meets the applicable CDM requirements and the identified criteria. Validation is a requirement for all CDM projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of certified emission reductions (CERs).

1.2. Scope

The validation scope is defined as an independent and objective review of the project design document, the project's baseline study and monitoring plan and other relevant documents. The information in these documents is reviewed against the requirements of paragraph 37 of the CDM M&Ps, the applicability conditions of the selected methodology and guidance issued by the Board.

The validation is not meant to provide any consulting towards the project participants. However, stated requests for clarifications and/or corrective actions may provide input for improvement of the project design.

1.3. Validation Team

The assessment team and internal technical reviewer team consist of the following personnel:

FUNCTION	NAME	TA 1.2	TA X.X	TASK PERFORMED*
Team Leader	Mr. Ram Desai	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> DR <input checked="" type="checkbox"/> SV <input checked="" type="checkbox"/> RI <input type="checkbox"/> TR
Team Member	Mr. Adarne Crispo	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> DR <input checked="" type="checkbox"/> SV <input checked="" type="checkbox"/> RI <input type="checkbox"/> TR
Financial Specialist	Jason Russell Aguilar	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> DR <input type="checkbox"/> SV <input type="checkbox"/> RI <input type="checkbox"/> TR
Internal Technical Reviewer (ITR)	Mr. Nyugen Hong Linh	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> DR <input type="checkbox"/> SV <input type="checkbox"/> RI <input checked="" type="checkbox"/> TR



*DR = Document Review; SV = Site Visit; RI = Report issuance; TR = Internal Technical Review

2. METHODOLOGY

The overall validation, from Contract Review to Verification Report & Opinion, was conducted using Bureau Veritas Certification internal procedures.

In order to ensure transparency, a validation protocol was customized for the project, according to the version 02.0 of the Clean Development Mechanism Validation and Verification Standard, issued by CDM Executive Board at its 65th meeting on 25/11/2010 (Ref/67/). The protocol shows, in a transparent manner, criteria (requirements), means of validation and the results from validating the identified criteria. The validation protocol serves the following purposes:

- It organizes, details and clarifies the requirements a CDM project is expected to meet;
- It ensures a transparent validation process where the validator will document how a particular requirement has been validated and the result of the validation.

The completed validation protocol is enclosed in Appendix A to this report.

2.1. Review of Documents

The Project Design Document (PDD) Version 2 (Ref/1/) submitted by San Carlos Biopower Inc. and additional background documents related to the project design and baseline were reviewed.

Furthermore, cross checks were made between information provided in the PDD (Ref/1/) and information from sources other than those used by the DOE's sectoral expertise.

To address Bureau Veritas Certification corrective action and clarification requests, San Carlos Biopower Inc. revised the PDD (Ref/1/) and resubmitted it on 10/12/2012.

The validation conclusions presented in this report relate to the project as described in the PDD Version 5 (Ref/2/).

2.2. Follow-up Interviews

On 17/08/2012, Bureau Veritas Certification performed a site visit and interviews with project stakeholders to confirm selected information and to resolve issues identified in the document review. Representatives of San Carlos Biopower Inc. were interviewed (see References). The main topics of the interviews are summarized in Table 1

**Table 1:** Interview topics

Interviewed organization	Interview topics
San Carlos Biopower Inc. (the Project Owner)	<ul style="list-style-type: none"> ➤ Project background information and CDM consideration. ➤ Project technology, operation and maintenance. ➤ Project approval and implementation status. ➤ Project management and monitoring plan. ➤ Stakeholder consultation process. ➤ Common practice in the area. ➤ Government policies related to the project activity.
Local Stakeholder	<ul style="list-style-type: none"> ➤ Project background in details ➤ Stakeholder comments ➤ Social and environmental impact of the project
Seedlinks Philippines, Inc. (the Consultant)	<ul style="list-style-type: none"> ➤ Applicability of selected methodology. ➤ Baseline determination. ➤ Emission reductions calculation. ➤ Emission reduction monitoring plan.

2.3. Resolution of Clarification, Corrective and Forward Action Requests

The objective of this phase of the validation is to resolve issues that require further elaboration, research or expansion prior to Bureau Veritas Certification's positive conclusion on the project design.

A Corrective Action Request (CAR) is raised, if one of the following situations occurs:

- (a) The project participants have made mistakes that will influence the ability of the project activity to achieve real, measurable, verifiable and additional emission reductions;
- (b) The applicable CDM requirements have not been met;
- (c) There is a risk that emission reductions cannot be monitored or calculated.

A Clarification Request (CL) is raised, if information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met.

A Forward Action Request (FAR) may also be raised during validation, to identify issues related to project implementation that require review during the first verification of the project activity.

To guarantee the transparency of the validation process, the issues raised, the responses provided by the project participants, the means of validation of such responses and references to any resulting changes in the PDD or supporting annexes are documented in the Validation Protocol in Appendix A.



2.4. Internal Technical Review

The validation report underwent an Internal Technical Review (ITR) before requesting registration of the project activity.

The ITR is an independent process performed to examine thoroughly that the process of validation has been carried out in conformance with the requirements of the validation scheme as well as internal Bureau Veritas Certification procedures.

The Team Leader provides a copy of the validation report to the reviewer, including any necessary validation documentation. The reviewer reviews the submitted documentation for conformance with the validation scheme. This will be a comprehensive review of all documentation generated during the validation process.

When performing an Internal Technical Review, the reviewer ensures that:

- The validation activity has been performed by the team by exercising utmost diligence and complete adherence to the CDM rules and requirements.
- The review encompasses all aspects related to the project which includes project design, baseline, additionality, monitoring plans and emission reduction calculations, internal quality assurance systems of the project participant as well as the project activity, review of the stakeholder comments and responses, closure of CARs and CLs during the validation exercise, review of sample documents.

The reviewer may raise Clarification Requests to the validation team and will discuss these matters with the Team Leader.

After the agreement of the responses to the Clarification Requests from the validation team as well as the PP(s), the finalized validation report is accepted for further processing such as uploading via the UNFCCC interface.

3. VALIDATION CONCLUSIONS

In the following sections, the conclusions of the validation are stated.

The findings from the desk review of the original project design documents and the findings from interviews during the follow up visit are described in the Validation Protocol in Appendix A.

The Clarification, Corrective and Forward Action Requests are stated, where applicable, in the following sections and are further documented in the Validation Protocol in Appendix A. The validation of the Project resulted in 12 CAR(s), 07 CL(s) and 00 FAR(s).

The CARs and CLs were closed out based on adequate responses from the Project Participant(s) which meet the applicable requirements. They have been reassessed before their formal acceptance and closure.

The number between brackets at the end of each section corresponds to the VVS paragraph.



3.1. Approval (43-44)

The letters of approval have been received and the following support documentation has been verified by Bureau Veritas Certification:

The DNA of the Philippines has issued a Letter of Approval (Ref/3/) on 05/06/2012 and its amendment certification on 11/06/2012 (Ref/4/) authorizing San Carlos Biopower Inc. as the Project Participant and confirms that the Project contributes to the Philippines' Sustainable development.

Bureau Veritas Certification received these letters of approval from the project participant and does not doubt the letters' authenticity. The letters of approval do not refer to a specific version of the validation report.

In accordance with para. 39 – 42/VVS, Bureau Veritas Certification considers that:

- (a) Each letter confirms the Party is a Party to the Kyoto Protocol;
- (b) Each letter confirms the participation is voluntary;
- (c) In the case of the host Party, the letter confirms that the proposed project activity contributes to the sustainable development of the country;
- (d) Each letter refers to the precise proposed project activity title in the PDD being submitted for registration.
- (e) The letter(s) of approval is unconditional with respect to the items above.
- (f) The letter(s) of approval has been issued by the respective Party's DNA and is valid for the proposed project activity under validation.

3.2. Authorization (49)

The participation for each project participant has been authorized by a Party of the Kyoto Protocol.

The validation team concludes this by referring to the information on UNFCCC website

<http://maindb.unfccc.int/public/country.pl?country=PH>

3.3. Sustainable Development (52)

The host Party's DNA has confirmed the contribution of the Project to the sustainable development of the host Party. Please refer to section 3.1 of this report.

3.4. Modalities of Communications (58,61)

The validation team has performed due diligence on the MoC statement and validated the corporate identity of all project participants and focal points included in the Modalities of



 VALIDATION REPORT

Communication (MoC) statement (Ref/5/), as well as the personal identities, including specimen signatures and employment status, of their authorized signatories.

Bureau Veritas Certification confirms that the MoC statement (Ref/5/) complies with all relevant forms and requirements.

3.5. Project Design Document (63)

Bureau Veritas Certification hereby confirms that the PDD complies with the latest forms of the guidance documents for completion of PDD.

3.6. Changes in the Project Activity (17)

During the site visit, no physical changes pertaining to the project design was observed as compared to details mentioned in the webhosted PDD (Ref/1/).

The major differences between the final version PDD (Ref/2/) and the webhosted PDD (Ref/1/) are listed in **Table 2** below:

Table 2: Changes between the final PDD and the webhosted PDD

Item	PDD version Version 2 (Webhosted)	PDD version 5 (Final)	Validation Opinion
Cover Page	PDD version 2 with completion date on 22/06/2012.	PDD version 5 with completion date on 28/12/2012	The validation team confirms the revision is appropriate.
	Estimated amount of annual average GHG emission reductions at 60,104 tons CO ₂ e.	Estimated amount of annual average GHG emission reductions at 64,088 tons CO ₂ e.	The validation team confirms the revision is appropriate.



A.1. Purpose and general description of project activity	The project will result to GHG emission reduction of an annual average of 60,104 tons CO ₂ and a total of 420,727 tons CO ₂ for the 7 years crediting period.	The project will result to GHG emission reduction of an annual average of 64,088 tons CO ₂ and a total of 448,614 tons CO ₂ for the 7 years crediting period.	
	Do not have.	References/footnotes for have been provided as sources of data/information.	This is in accordance to the issuance of CL 2 . Hence, the validation team confirms the revision is appropriate.
A.3 Technologies and/or measures	Do not have.	This Project assumes a 25-year plant operating life based on equipment lifetime. Description of the technical specifications of the boiler, steam turbine, and the generator.	This is in accordance to the issuance of CL 1 . Hence, the validation team confirms the revision is appropriate.
	The plant requires about 194,614 tons of biomass comprising sugar cane residue (leafy residues left on the ground post harvest), energy crop plantations (ECP), current tree stands, and other biomass.	The plant requires about 184,140 tons of biomass comprising sugar cane residue (leafy residues left on the ground post harvest), energy crop plantations (ECP), current tree stands, and other biomass.	The validation team confirms the revision is appropriate.
	Do not have.	Footnotes/references for sources of data	This is in accordance to the issuance of CL 2 . The validation team confirms the revision is



			appropriate.
B.1. Reference of methodology	Tool for the demonstration and assessment of additionality, version 06.0.0 has been referenced.	Tool for the demonstration and assessment of additionality, version 06.0.0 has been deleted.	This is in accordance to the issuance of CAR 12 . Hence, the validation team confirms the revision is appropriate.
	Do not have.	The following have been included: <ul style="list-style-type: none"> • Project and leakage emissions from road transportation of freight - Version 01.0.0; and • Tool to calculate project or leakage CO₂ emissions from fossil fuel combustion - Version 02. 	
	Tool to calculate the emission factor for an electricity system – Version 2.2.1	Tool to calculate the emission factor for an electricity system – Version 3.0.0	The validation team confirms the revision is appropriate.
B.2. Applicability of methodology	Applicability condition (1) does not have description of listing of suppliers of biomass.	Applicability condition (1) description with listing of suppliers of the sources of biomass to be sourced from existing sugarcane fields, dedicated energy crops and agricultural residues within 40-km radius.	This is in accordance to the issuance of CL 3 . Hence, the validation team confirms the revision is appropriate.
	Applicability condition (2) with description that the project will co-fire fossil fuel as a back-up and start-up fuel, but it will not exceed the 80% limit.	Applicability condition (2) with description as follow: <ul style="list-style-type: none"> • The amended Environmental Compliance Certificate (ECC) issued to San Carlos Biopower Inc. by the Department of Environment and Natural Resources (DENR), the project is 	This is in accordance to the issuance of CAR 1 . Hence, the validation team confirms the revision is appropriate.



		<p>allowed to utilize lignite up to 25% of the fuel mix. This translates to approximately 25% fossil fuel consumption on an energy basis, using the net calorific values (NCV) of lignite 9.99 GJ/ton. If lignite will constitute 25% of the fuel mix by mass, this translates to 25.50% of the total heat requirement. Therefore, the possible co-firing of lignite will not exceed the 80% of the total fuel fired on an energy basis.</p> <ul style="list-style-type: none"> Attachment of tables for Case 1 (energy basis) and Case 2 (mass basis). 	
	Applicability condition (4) with description that the biomass residues to be used by the project facility will not be stored for more than one year	Applicability condition (4) with description that the storage will be implemented on a "first in, first out (FIFO)" basis, where the older bales will be taken out first under strict schedule to ensure that no biomass residues will be stored for more than one year.	This is in accordance to the issuance of CL 4 . Hence, the validation team confirms the revision is appropriate.
B.3. Project Boundary	GHG emission of CH ₄ from Project Activity due to Wastewater from the treatment of biomass residues is included.	GHG emission of CH ₄ from Project Activity due to Wastewater from the treatment of biomass residues is excluded.	This is in accordance to the issuance of CAR 2 . Hence, the validation team confirms the revision is appropriate.
	Figure 3 on schematic Diagram of Project Boundary has not included the Grid and Power plants connected to	Figure 3 on schematic Diagram of Project Boundary has included the Luzon-Visayas Grid and Power plants connected to the grid in the	This is in accordance to the issuance of CAR 3 .



VALIDATION REPORT

	the grid in the project boundary.	project boundary.	Hence, the validation team confirms the revision is appropriate.
B.4. Establishment and description of baseline scenario	Step wise demonstration of baseline scenario and additionality in accordance with "Tool for the demonstration and assessment of additionality"	Step wise demonstration of baseline scenario and additionality in accordance with the approved methodology ACM0018-Version 02.0.0	This is in accordance to the issuance of CAR 4, CAR 5, CAR 6, CAR 7, and CAR 8. Hence, the validation team confirms the revision is appropriate.
	Do not have.	Summary and table of awarded biomass projects used in common practice analysis.	The validation team confirms the revision is appropriate.
B.5. Demonstration of additionality	<p>Details in Table 3 on Prior Consideration of CDM as follows:</p> <ul style="list-style-type: none"> • FSR on December 2009 • Do not have. • Do not have. • Equipment contract signing on July 2012. • Target Financial Closure on December 2012. • Expected operation of the CDM project on 	<p>Details in Table 3 on Prior Consideration of CDM as follows:</p> <ul style="list-style-type: none"> • FSR on February 2009 • Consultation with the Barangay Officials on 3 July 2009 • Consultation with the City Councilors on 23 July 2011 • EPC contractor Equipment contract Awarding/signing on 10 August 2012. • Deleted • Deleted 	The validation team confirms the revision is appropriate.



VALIDATION REPORT

	January 2012.		
B.6.1. Explanation of methodological choices	Do not have	Step wise determination of the baseline emissions as required by the approved methodology including justification for applicability and non-applicability.	This is in accordance to the issuance of CAR 9 . Hence, the validation team confirms the revision is appropriate.
B.6.2. Data and parameters fixed ex ante	Computation of the emission factor for electricity the Luzon-Visayas grid is used based on the latest 2010 net generation data from the Philippine Department of Energy. Applied value for $EF_{BL,EL,y}=0.466$	Computation of the emission factor for electricity the Luzon-Visayas grid is used based on the latest 2011 net generation data from the Philippine Department of Energy. Applied value for $EF_{BL,EL,y}=0.494$	This is in accordance to the issuance of CL 6 . Hence, the validation team confirms the revision is appropriate.
	<p>$BR_{n,p,y}$: Quantity of biomass residues of category n used in year y in power plant p</p> <ul style="list-style-type: none"> Biomass Residue category 2: CTS Thinnings/ harvest wastes at 49,974 tonnes (year 1) Biomass Residue category 3: Other agricultural residues (coconut husks and shells, corn cobs, rice straw) at 12,177 tonnes (year 1) 	<p>$BR_{n,p,y}$: Quantity of biomass residues of category n used in year y in power plant p</p> <ul style="list-style-type: none"> Biomass Residue category 2: CTS Thinnings/ harvest wastes at 56,550 tonnes (year 1) Biomass Residue category 3: Other agricultural residues (coconut husks and shells, corn cobs, rice straw) at 6,088 tonnes (year 1) 	The validation team confirms the revision is appropriate.
	<p>$BR_{n,p,y}$: Quantity of biomass residues of category n used in year y in power plant p</p> <ul style="list-style-type: none"> Woody residues/thinnings from Current Tree Stands (CTS) at 	<p>$BR_{n,p,y}$: Quantity of biomass residues of category n used in year y in power plant p</p> <ul style="list-style-type: none"> Woody residues/thinnings from Current Tree Stands (CTS) at 56,550 tonnes 	The validation team confirms the revision is appropriate.



VALIDATION REPORT

	<p>49,974 tonnes (year 1)</p> <ul style="list-style-type: none"> Other Biomass (Coconut, rice husk/straw, corn cobs/stalks or bamboo) at 12,177 tonnes (year 1) Total at 145,468 tonnes (year 1) 	<p>(year 1)</p> <ul style="list-style-type: none"> Other Biomass (Coconut, rice husk/straw, corn cobs/stalks or bamboo) at 6,088 tonnes (year 1) Total at 145,956 tonnes (year 1) 	
	<p>EG_{p,y}: Net quantity of electricity generated in power plant <i>p</i> in year <i>y</i></p> <ul style="list-style-type: none"> Value applied at 125,891.71 MWh/yr 	<p>EG_{p,y}: Net quantity of electricity generated in power plant <i>p</i> in year <i>y</i></p> <ul style="list-style-type: none"> Value applied at 127,011.24 MWh/yr 	The validation team confirms the revision is appropriate.
B.6.3. Ex ante calculation of emission reduction	<p>Baseline emissions:</p> <ul style="list-style-type: none"> BE_{EL,y} = 58,666 tons CO₂ per year BE₁ = 61,986 tons CO₂ for year 1 <p>Project emissions:</p> <ul style="list-style-type: none"> PE_{BR,y} = 713 tCO₂ for year 1 <p>Emission reduction :</p> <p>ER₁ = 59,647 tCO₂ for year 1</p>	<p>Baseline emissions:</p> <ul style="list-style-type: none"> BE_{EL,y} = 62,744 tons CO₂ per year BE₁ = 66,064 tons CO₂ for year 1 <p>Project emissions:</p> <ul style="list-style-type: none"> PE_{BR,y} = 674 tCO₂ for year 1 <p>Emission reduction :</p> <ul style="list-style-type: none"> ER₁ = 63,559 tCO₂ for year 1 	The validation team confirms the revision is appropriate.
B.6.4. Summary of ex ante estimates of emission reductions	<p>Crediting period from 2014 to 2020.</p> <p>Baseline emissions:</p> <ul style="list-style-type: none"> Annual average over the crediting period at 62,384 CO₂e with total at 436,690 t CO₂e <p>Project emissions:</p> <ul style="list-style-type: none"> Annual average over the crediting period at 2,280 CO₂e with total at 15,963 t CO₂e <p>Emission reduction:</p> <ul style="list-style-type: none"> Annual average over the crediting period at 60,104 CO₂e with total 	<p>Crediting period from 2012 to 2012.</p> <p>Baseline emissions:</p> <ul style="list-style-type: none"> Annual average over the crediting period at 66,462 CO₂e with total at 465,236 t CO₂e <p>Project emissions:</p> <ul style="list-style-type: none"> Annual average over the crediting period at 2,375 CO₂e with total at 16,622 t CO₂e <p>Emission reduction:</p> <ul style="list-style-type: none"> Annual average over the crediting period at 64,088 CO₂e with total at 448,614 t CO₂e 	The validation team confirms the revision is appropriate.



VALIDATION REPORT

	at 420,727 t CO ₂ e		
B.7.1. Data and parameters to be monitored	BR_{n,p,y} : Quantity of biomass residues of category <i>n</i> used in year <i>y</i> in power plant <i>p</i> <ul style="list-style-type: none"> Woody residues/thinnings from Current Tree Stands (CTS) at 49,974 tonnes (year 1) Other Biomass (Coconut, rice husk/straw, corn cobs/stalks or bamboo) at 12,177 tonnes (year 1) Total at 145,468 tonnes (year 1) 	BR_{n,p,y} : Quantity of biomass residues of category <i>n</i> used in year <i>y</i> in power plant <i>p</i> <ul style="list-style-type: none"> Woody residues/thinnings from Current Tree Stands (CTS) at 56,550 tonnes (year 1) Other Biomass (Coconut, rice husk/straw, corn cobs/stalks or bamboo) at 6,088 tonnes (year 1) Total at 145,956 tonnes (year 1)	The validation team confirms the revision is appropriate.
	BR_{n,B1/B3,y} : Quantity of Biomass Transported (Delivered Quantity) Amount of biomass residues category <i>n</i> used in the project plant(s) included in the project boundary in year <i>y</i> for which B1 or B3 has been identified as the most plausible baseline scenario <ul style="list-style-type: none"> Woody residues/thinning at 76,707 tonnes (Year 1) Other Biomass (Coconut, rice husk/straw, corn cobs/stalks or bamboo) at 19,226 tonnes (Year 1) Total at 1 186,433 tonnes (Year 1) 	BR_{n,B1/B3,y} : Quantity of Biomass Transported (Delivered Quantity) Amount of biomass residues category <i>n</i> used in the project plant(s) included in the project boundary in year <i>y</i> for which B1 or B3 has been identified as the most plausible baseline scenario <ul style="list-style-type: none"> Woody residues/thinning at 82,763 tonnes (Year 1) Other Biomass (Coconut, rice husk/straw, corn cobs/stalks or bamboo) at 9,613 tonnes (Year 1) Total at 182,876 tonnes (Year 1) 	The validation team confirms the revision is appropriate.
	BR_{TR,y} : Quantity of Biomass Transported (Delivered	BR_{TR,y} : Quantity of Biomass Transported (Delivered	The validation team confirms



VALIDATION REPORT

	<p>Quantity) Quantity of biomass residues that has been transported to the project site during the year y</p> <ul style="list-style-type: none"> Woody residues/thinning at 76,707 tonnes (Year 1) Other Biomass (Coconut, rice husk/straw, corn cobs/stalks or bamboo) at 19,226 tonnes (Year 1) Total at 1 186,433 tonnes (Year 1) 	<p>Quantity) Quantity of biomass residues that has been transported to the project site during the year y</p> <ul style="list-style-type: none"> Woody residues/thinning at 82,763 tonnes (Year 1) Other Biomass (Coconut, rice husk/straw, corn cobs/stalks or bamboo) at 9,613 tonnes (Year 1) Total at 182,876 tonnes (Year 1) 	the revision is appropriate.
	<p>EG_{PJ,aux,y}: Total auxiliary electricity consumption required for the operation of the power plants at the project site at 16,036 MWh</p>	<p>EG_{PJ,aux,y}: Total auxiliary electricity consumption required for the operation of the power plants at the project site at 14,900.76 MWh</p>	The validation team confirms the revision is appropriate.
	<p>NCV_{n,y}: Net Calorific Value of Biomass Residues</p> <ul style="list-style-type: none"> Cane Trash at 0.01030 TJ/tonnes on dry-basis Woody Energy Crop Plantations (ECP) at 0.01210 TJ/tonnes on dry-basis Grassy Energy Crop Plantations (ECP) at 0.01025 TJ/tonnes on dry-basis Woody residues/thinning at 0.01210 TJ/tonnes on dry-basis 	<p>NCV_{n,y}: Net Calorific Value of Biomass Residues</p> <ul style="list-style-type: none"> Cane Trash at 0.00973 TJ/tonnes on dry-basis Woody Energy Crop Plantations (ECP) at 0.01187 TJ/tonnes on dry-basis Grassy Energy Crop Plantations (ECP) at 0.01007 TJ/tonnes on dry-basis Woody residues/thinning at 0.01282 TJ/tonnes 	The validation team confirms the revision is appropriate.
	<p>AVD_y: Average round trip distance (from and to) between biomass fuel supply sites and the project site</p> <ul style="list-style-type: none"> Cane Trash at 60 km 	<p>AVD_y: Average round trip distance (from and to) between biomass fuel supply sites and the project site</p> <ul style="list-style-type: none"> Cane Trash at 80 km 	The validation team confirms the revision is appropriate.



	Do not have.	Consumption of Lignite as start-up/back-up fuel	This is in accordance to the issuance of CAR 10 . Hence, the validation team confirms the revision is appropriate.
B.7.3. Other elements of monitoring plan	Do not have.	Procedures for data uncertainty in case of meter failure or meter errors; and for apportioning the monitored data in case of mismatch in the dates of the billing cycle and the verification period.	The validation team confirms the revision is appropriate.
C.1.1. Start date of project activity	01/12/2012 – Tentative date of start of project activity as evidenced by the Notice To Proceed issued to the EPC Contractor	10/08/2012 - Awarding of EPC Contract Agreement for SCBP Power Plant between SCBP and Wuxi Huaguang Electric Power Engineering Co., Ltd (WUXI-HEPECL)	The validation team confirms the revision is appropriate.
Section F. Approval and authorization	LOA approval on 5 June 2012.	LOA was approved on 5 June 2012 and was amended on 11 June 2012 to reflect the rated capacity of 18 MW instead of 18.9 MW.	The validation team confirms the revision is appropriate.
Appendix 1: Contact information of project participants	Jose Maria P. Zabaleta, Jr.	Mr. Juan Xavier P. Zabaleta	The validation team confirms the revision is appropriate.
Appendix 4: Further background information on ex ante calculation of emission reductions	Grid emission factor calculations based on 2010 net electricity generation for Luzon-Visayas Grid	Grid emission factor calculations based on 2011 net electricity generation for Luzon-Visayas Grid	This is in accordance to the issuance of CL 6 . Hence, the validation team confirms the revision is appropriate.



Appendix 7: Assumptions	Do not have	Assumptions for financial analysis.	The validation team confirms the revision is appropriate.
Appendix 8	Do not have.	List of awarded Biomass Contract.	The validation team confirms the revision is appropriate.

3.7. Project Description (69)

The Project is an installation of new biomass power plant located in Barangay Palampas, San Carlos Ecozone, San Carlos City, Negros Occidental, Philippines which has geographical coordinates of North latitude: 10°30'36.0" and East longitude E 123°25'16.0". The Validation team has confirmed this GPS coordinates during the site visit where the project site is at least 5 minutes from San Carlos City by car. Proposed site is currently a sugarcane plantation.

The proposed biomass power plant will utilize primarily the cane field residues commonly left on the ground either to decay or be burnt, and grassy and woody biomass and from dedicated energy crop plantations to be established in the hills of San Carlos and neighboring municipalities within the 40-km radius from the plant. During the initial years of operation, the woody biomass would be sourced from existing private tree plantations for use along with other agriculture residues while the plantations.

The project activity will be composed of the following:

Power Plant:

The PP will provide a circulating fluidized bed which was selected primarily due to its flexibility in utilizing various types of biomass fuels considering variable moisture, high-alkali and high chlorine nature of the fuel. The fuel is primarily be agricultural residues, particularly cane field residues commonly known as cane trash, and others such as, but not limited to, coconut husks/shells, rice straw, tree plantation thinnings. Woody and grassy biomass are supplemental fuel that will be harvested from dedicated energy crop plantations which are to be established for this project. The power plant will consist of an advanced biomass-fired high-pressure boiler which consists of with the boiler proper, a forced air-fan draft system, an induced draft fan, air pre-heater, and steam, air and flue gas ducts. The operating conditions of the boiler are 70 to 75 tons of steam per hour at 98 bar (abs) and 540°C. The boiler will supply the steam requirements for the 18 MW condensing-steam turbine-generator set., some of which (approximately 2 MW) is required to energize all the electrical motors that drive the conveyors, fans, pump motors, dust collector, control system, etc. of the power-plant. The net power output of the plant is approximately 16 MW and stepped-up to 69 kV and phase-synchronized before being evacuated via an approximately 2 km transmission line and connected to the grid. A 3-phase electrical power with 18 MW gross power steam turbine and generator with ancillary equipment with approximately 2 MW is required to



VALIDATION REPORT

energize all the electrical motors that drive the conveyors, fans, pump motors, dust collector, control system, etc. of the power-plant. The PP has applied a 25-year plant operating life based on the Tool to determine the remaining lifetime of equipment – Version 01, EB 50 (Ref/77/) which was confirmed by the Validation team as acceptable. The plant is expected to be available for 7,884 hours per year (8,760 hours per year at 90% plant availability) with guaranteed boiler efficiency of 92%. The plant, which has a gross capacity of 18MW and 10.5% auxiliary load, is expected to generate 127,011.24 MWh/year. The plant technical specifications as described in the PDD Version 5 (Ref/2/) have been confirmed by the Validation team as acceptable from the EPC Contract Agreement. (Ref/6/).

Fuel Processing and Handling

The PP will provide a fuel processing and handling facility will covered and open storage facility while processing the various fuels. The fuels will be delivered to the facility on trucks ranging in capacity from 10 to 30 tons. A weigh scale and moisture analyzer will be installed at the plant site to measure the weight and moisture content of the various biomass fuel types as they are delivered. The fuel will be processed to a size specified by the boiler manufacturer, and the conveying and feeding system will be designed to provide fuel for 24-hour continuous operation of the Plant. The fuel consumption will be approximately 20 tons per hour (“tph”) at the maximum continuous rating (“MCR”) of the Plant. Two feeding conveyors to the boiler will each have belt weighers that will be connected directly to DCS with a totalizer. The fuel processing and handling facility requirements have been confirmed by the Validation team based on the Feasibility Study (Ref/58/), Integrated Cane & Residue Collection Feasibility Report, Bronzeoak Group, GENESYS Foundation, Booker Tate, Conducted in cooperation with Renewable Energy & Energy Efficiency Partnership (March 2005) (Ref/7/), and Cane Residue Collection Trials & Transport Study: Final Report, Bronzeoak Phils (RRodriguez), Talisay Bioenergy Inc., EC-ASEAN Fund, Global Opportunities Fund (March 2004) (Ref/8/).

Water Supply System:

The PP has a 20 year water supply contract (Ref/9/) with San Carlos Economic Zone's designated water supplier which owns and operates the deep-well aquifer located under one kilometer away from the facility and with a production capacity of approximately 300m³ per hour which adequate to supply the facility requirement of about 140 cubic m³ per hour of water. Water will be clarified, filtered, and de-aerated prior to use in the boiler.

Waste Treatment Facilities:

The PP will provide wastewater treatment plant based on the EPC Contract Agreement (Ref/6/) which can be categorized into industrial wastewater, sewerage from the office buildings and rainwater. Most of the industrial wastewater produced will be in the form of boiler blow-down, cooling water blow-down, and some from the water treatment. Oily waste from the transformer and turbine areas will be collected, skimmed, separated and disposed of in an acceptable way. The cleaned water will be used to supply service water to the Plant and the site. The excess cleaned wastewater from the facility will be discharged in conformity with the local environmental standards. The office sewerage will be pumped into an underground latrine and the rainwater will be drained away via a separate storm-water system.

**Supply of biomass fuel:**

The PP will establish a Fuel Supply Division (Ref/13/) which will be responsible for the annual fuel requirements of 184,140 tons of biomass comprising sugar cane residue (leafy residues left on the ground post harvest), energy crop plantations ECP consisting of grassy ECP and woody ECP, current tree stands, and other biomass. The entire biomass requirement of the plant can be sourced from the annually existing sugar cane residues and represents only 10% of the available resource within the 40-km radius. As cane trash is not a commodity in the area and there is no existing supply chain system, the project will build up its capability to manage the supply chain up to 60% of the fuel mix. The rest of the fuel will be other types of biomass which is composed of components of the coconut tree (fronds, husks and shells), rice (straw and husks), corn (stalks and cobs) as well as bamboo. A local type of bamboo can be grown as a 'dedicated plantation' for the CDM project. The current tree stands (CTS) from private tree plantation will supply the biomass fuel while the ECPs are being established over the initial years of operation of the facility. These sources will be limited to purpose-grown plantations' thinnings or harvest wastes and will not include primary or secondary natural growth forests. Such plantations abound throughout the island and are mostly of introduced plantations species. The Validation has confirmed the availability of the supply of biomass for the power plant operations from Feasibility Study (Ref/58/), Fuel Supply Study, Biomass Resources Inc (June 2012) (Ref/10/), Biomass Assessment Study, Biomass Resources Inc (June 2010) (Ref/11/), Philippine Biofuel Resources, Chris Norris (May 2003) (Ref/12/), and Fuel Supply Contract Agreements (Ref/15/).

Prior to the implementation of the project activity, the electricity is generated distributed to consumers via the Luzon-Visayas grid. The baseline scenario of the project activity is the same as the scenario existing prior to the start of implementation of the project activity.

The source of baseline emissions to be reduced is from the grid electricity generation that would be supplied by this CDM project activity, which would have been supplied by the Luzon-Visayas grid without this CDM project. The project will result to greenhouse gas emission reduction of an annual average **64,088** tons CO₂e and a total of **448,614** tons CO₂e for the 7 years crediting period.

The validation team confirms that the estimated PLF of 90% is sourced from EPC Contract Agreement Technical Specification (Ref/6/) which is complying with the Para. 3 (b) of "Guidelines for the Reporting and Validation of Plant Load Factors" version 01 (Ref/71/).

The validation did not reveal any information indicating that the Project can be seen as a diversion of official development assistance (ODA) funding towards the host country.

The processes undertaken by the validation team to validate the accuracy and completeness of the project description include conducting a physical site inspection, reviewing the Feasibility Study (Ref/58/), EPC Contract (Ref/6/), Integrated Cane & Residue Feasibility Report (Ref/7/), Cane Residue Collection Trials & Transport Study: Final Report (Ref/8/), Water Supply Contract Between San Carlos Land, Inc. and San Carlos Biopower Inc. (Ref/9/), Fuel Supply Study (Ref/10/), Biomass Assessment Study (Ref/11/), Philippine Biofuel Resources (Ref/12/), and SCBP organization (Ref/13/).

Bureau Veritas Certification hereby confirms that the project description in the final PDD (Ref/2/) is accurate and complete in all respects.



3.8. Baseline and Monitoring Methodology

3.8.1. Applicability of the selected Methodology (77)

The Project uses the approved consolidated baseline and monitoring methodology ACM 0018 "Consolidated methodology for electricity generation from biomass residues in power-only plants" (Ref/72/).

The applicability of the selected methodology is justified and assessed as follows:

- (1) **Applicability condition 1:** *This methodology is applicable to project activities that generate electricity in biomass residue (co-) fired power-only plants*
- The validation team has confirmed through physical site inspection and document reviews that this applicability condition is met by the project activity. The Project Activity is an installation and operation of a new greenfield 18 MW biomass power plant in San Carlos City, Negros Occidental, Philippines, to generate renewable energy for grid connection using biomass resources within a 40-km radius. The technology will be the combustion of biomass for the production of steam in a boiler to feed to a turbine for electricity generation wherein, the power plant will consist of an advanced biomass-fired high-pressure boiler, steam turbine and generator with ancillary equipment. Document reviews were confirmed through the Feasibility Study (Ref/58/), EPC Contract Agreement (Ref/6/). Furthermore, the power was confirmed by the validation as fire power-only plant based on the process diagram design drawings (Ref/16/) of the EPC Contract Agreement (Ref/6/).
- (2) **Applicability condition 2:** *The project activity may include the following activities or, where applicable, combinations of these activities:*
- *The installation of new biomass residues (co-)fired power-only plants at a site where currently no power generation occurs (greenfield power projects);*
 - As mentioned in Applicability condition 1, the project is an installation and operation of a new greenfield 18 MW biomass power plant in San Carlos City, Negros Occidental, Philippines, to generate renewable energy for grid connection using biomass resources within a 40-km radius. Hence, the applicability condition is applicable.
 - *The installation of new biomass residues (co-)fired power-only plants, which replace or are operated next to existing power-only plants fired with fossil fuels and/or biomass residues (power capacity expansion projects);*
 - As mentioned in Applicability condition 1, the project is an installation and operation of a new greenfield 18 MW biomass power plant in San Carlos City, Negros Occidental, Philippines, to generate renewable energy for grid connection using biomass resources within a 40-km radius. Hence, the applicability condition is not applicable.
 - *The improvement of energy efficiency of existing biomass residues (co-)fired power-only plants (energy efficiency improvement projects), which can also lead to a capacity expansion, e.g. by retrofitting the existing plant;*
 - As mentioned in Applicability condition 1, the project is an installation and operation of a new greenfield 18 MW biomass power plant in San Carlos City, Negros Occidental, Philippines, to generate renewable energy for grid connection using biomass resources within a 40-km radius. Hence, the applicability condition is not applicable.



- *The total or partial replacement of fossil fuels by biomass residues in an existing power only plant or in a new power-only plant that would have been built in the absence of the project (fuel switch projects), e.g. by increasing the share of biomass residues use as compared to the baseline, by retrofitting an existing plant to use biomass residues, etc*
 - As mentioned in Applicability condition 1, the project is an installation and operation of a new greenfield 18 MW biomass power plant in San Carlos City, Negros Occidental, Philippines, to generate renewable energy for grid connection using biomass resources within a 40-km radius. Hence, the applicability condition is not applicable.
- (3) ***Applicability condition 3:*** *The biomass residues used in the project activity may be produced on-site (e.g. if the project activity is based on the operation of a power plant located in an (agro-)industrial plant generating the biomass residues), or they can be obtained off-site from the nearby area, specific suppliers or purchased from a market.*
- The validation team has confirmed the applicability of the condition. The biomass residues to be used in the project activity are to be obtained from the off-site locations from existing sugarcane fields, dedicated energy crops and agricultural residues within 40-km radius as validated from Feasibility Study (Ref/58/) as well as from Fuel Supply Agreements from Biomass Resources Inc, Negocor, Nelson Lim, Belmayor Devt Corp, Jun Ballesteros, GHI MPC, Hacienda Euzkara, High Grains (Quezon), Hacienda Providencia, Brgy Punao, Hacienda San Vicente, Hacienda Socorro, Hacienda Vasconia, Hacienda Filomena, Hacienda Tranquilio, GENESYS Foundation, Manuel Puertillano, Anecito Amoy, Marciana Baculi, Benigno Palmares, Angelito Donan, and Reynaldo Dagoldogol. (Ref/15/)
- (4) ***Applicability condition 4:*** *No other biomass types than biomass residues, as defined above, are used in the project plant.*
- The validation team has confirmed the applicability of the condition from the Feasibility Study (Ref/58/), Fuel Supply Study by Biomass Resources Inc.(Ref/10) and Biomass Assessment Study by Biomass Resources Inc. (Ref/11/). The biomass residues to be used in the project activity are cane trash, CTS Thinnings/ harvest wastes, other agricultural residues (coconut husks and shells, corn cobs, rice straw), woody ECP, and grassy ECP which qualify to the definition of the biomass residues in the ACM0018 Version 02.0.0 (Ref/72/).
- (5) ***Applicability condition 5:*** *Fossil fuels may be co-fired in the project plant. However, the amount of fossil fuels cofired shall not exceed 80% of the total fuel fired on an energy basis.*
- The validation team has confirmed the applicability of the condition from the EPC Contract Agreement (Ref/6/) and Environmental Compliance Certificate (ECC) No. R6-0912-393-4220 issued to San Carlos Biopower Inc. by the Department of Environment and Natural Resources (DENR) (Ref/14/) which allowed the project to utilize lignite up to 25% of the fuel mix. This fuel mix



has also been confirmed by the validation team not to exceed 25.50% of the total heat requirement when using lignite as allowed by the technical specification of the EPC Contract Agreement SCBP Power Plant (Ref/6/). Hence, the possible co-firing of lignite will not exceed the 80% of the total fuel fired on an energy basis.

(6) **Applicability condition 6:** *For projects that use biomass residues from a production process (e.g. production of sugar or wood panel boards), the implementation of the project shall not result in an increase of the processing capacity of raw input (e.g. sugar, rice, logs, etc.) or in other substantial changes (e.g. product change) in this process.*

- Not applicable. The project does not use biomass residues from a production process (e.g. production of sugar or wood panel boards).

(7) **Applicability condition 7:** *The biomass residues used by the project facility should not be stored for more than one year.*

- The validation team has confirmed the applicability of the condition based on the storage requirement employing the “first in, first out (FIFO)” basis, where the older bales will be taken out first under strict schedule to ensure that no biomass residues will be stored for more than one year as described in the PDD (Ref/2/).

(8) **Applicability condition 8:** *Projects that chemically process the biomass residues prior to combustion (e.g. by means of esterification, fermentation and gasification) are not eligible under this methodology. The biomass residues can however be processed physically such as by means of drying, pelletization, shredding and briquetting.*

- Not applicable. The biomass residues will not be processed chemically prior to combustion.

(9) **Applicability condition 9:** *No power and heat plant operates at the project site during the crediting period.*

- Not applicable. No power and heat plant will operate at the project site during the crediting period.

(10) **Applicability condition 10:** *If any heat is generated for purposes other than power generation (e.g. heat which is produced in boilers or extracted from the header to feed thermal loads in the process) during the crediting period or was generated prior to the implementation of the project activity, by any on-site or off-site heat generation equipment connected to the project site, the following conditions should apply:*

- The implementation of the project activity does not influence directly or indirectly the operation of the heat generation equipment, i.e. the heat generation equipment would operate in the same manner in the absence of the project activity;*
- The heat generation equipment does not influence directly or indirectly the operation of the project plant (e.g. no fuels are diverted from the heat generation equipment to the project plant); and*



(c) *The amount of fuel used in the heat generation equipment can be monitored and clearly differentiated from any fuel used in the project activity.*

- Not applicable. No heat is generated for purposes other than power generation. Hence, the conditions for project activities where heat is generated for purposes other than power generation do not apply.

(11) *Applicability condition 11: In the case of fuel switch project activities, the use of biomass residues or the increase in the use of biomass residues as compared to the baseline scenario is technically not possible at the project site without a capital investment in:*

- *The retrofit or replacement of existing heat generators/boilers; or*
- *The installation of new heat generators/boilers; or*
- *A new dedicated biomass residues supply chain established for the purpose of the project (e.g. collecting and cleaning contaminated new sources of biomass residues that could otherwise not be used for energy purposes);*
- *Equipment for preparation and feeding of biomass residues.*
 - Not applicable. The project activity does not involve fuel switching.

(12) **Applicability condition 12:** *The methodology is only applicable if the most plausible baseline scenario, as identified per the .Procedure for the selection of the baseline scenario and demonstration of additionality. Section hereunder, is:*

- *For power generation: Scenarios P2 to P7, or a combination of any of those scenarios;*
- *For biomass use: Scenarios B1 to B8, or a combination of any of those scenarios. However, note that for scenarios B5 to B8, leakage emissions should be accounted for as per the procedures of the methodology.*

Bureau Veritas Certification hereby confirms that the selected baseline and monitoring methodology, tool and other methodology component is previously approved by the CDM Executive Board, and is applicable to the Project, which, complies with all the applicability conditions therein.

3.8.2. Project Boundary (86-87)

The validation team has validated the project boundary by:

(a) Assessing the relevant documents including the Feasibility Study (Ref/58/), EPC Contract Agreement for SCBP Power Plant (Ref/6/) including fuel supply facilities and handling, Fuel Supply Contracts for biomass suppliers (Ref/15/).

(b) On-site visit.

The spatial extent of the project boundary is clearly defined in line with Approved Methodology ACM 0018 Version 02.0.0 (Ref/72/) as follows:

- The project activity power-only plant;
- All power plants connected physically to the Luzon-Visayas Grid of the Philippines that the project plant is connected to;

VALIDATION REPORT

- The means of transportation of biomass residues to the project site; and
- The biomass residues storage and preparation prior to combustion.

The validation team has assessed the spatial extent of the project boundary through the description provided in the PDD Version 5 (Ref/2/) which was found acceptable. The project boundary includes the project power plant, all power plants connected physically to the Luzon-Visayas Grid of the Philippines, the means of transportation of biomass residues to the project site, and processing activities prior to combustion (i.e. storage and preparation). The project boundary delineation and identification of sources of GHG gases is done by PP appropriately and it is demonstrated in the PDD Version 5 (Ref/2/). The system boundaries and emissions are presented in the following Table 3:

Table 3: System boundaries and emissions

	GHG's Involved	Description
Baseline emissions	CO ₂	Electricity generation: The baseline emission factor for the project is determined ex-ante as a combined margin, consisting of the weighted average of the operating margin (OM) and Build Margin (BM) emission factors. The combined margin (CM) emission factor for the grid which is connected to the Project power plant is calculated as 0.494 tCO ₂ /MWh (Ref/20/).
	CH ₄	Uncontrolled burning or decay of surplus biomass residues from the baseline scenario B3.
Project Emissions	CO ₂	On-site fossil fuel consumption. Fossil fuel (coal) will only be used as backup in case that biomass is not available.
	CO ₂	On-site transportation using heavy trucks of biomass residues from collection site to power plant and back to collection.
	CO ₂	Combustion of biomass residues for electricity at the power plant.
Leakage Emissions	No Leakage	According to ACM 0018 Version 02.0.0 (Ref/72/), leakage emissions are not applicable since the biomass baseline is identified as B3 and hence excluded. Leakage emissions are only applied for categories of biomass residue whose baseline scenario has been identified as B5, B6, B7, or B8.

Validation team has confirmed the project boundary as mentioned in the PDD during site visit and it was verified from the Feasibility Study (Ref/58/), EPC Contract Agreement (Ref/6/), Project process diagram (Ref/16/), Integrated Cane & Residue Collection Feasibility Report (Ref/7/), Cane Residue Collection Trials & Transport Study: Final Report (Ref/8/), Fuel Supply Study (Ref/10/), and Biomass Assessment Study (Ref/11/) are included in the project boundary

- Boilers
- Generators



- On-site transportation of the biomass residues
- Fuel processing and handling facilities
- Fuel supply base

The identified boundary and selected sources and gases are justified for the project activity. The validation of the project activity did not reveal other greenhouse gas emissions occurring within the proposed CDM project activity boundary as a result of the implementation of the proposed project activity which are expected to contribute more than 1% of the overall expected average annual emission reduction, which are not addressed by ACM 0018 Version 02.0.0 (Ref/72/).

Based on the above assessment, the DOE hereby confirms that the identified boundary and the selected sources and gases are justified for the project activity.

3.8.3. Baseline Identification (94-95)

The procedure contained in the methodology to identify the most reasonable baseline scenario has been correctly applied.

The PP has applied the stepwise procedure in accordance with the approved consolidated methodology ACM 0018 Version 02.0.0 (Ref/72/) in the selection of the baseline scenario as explained below:

Step 1: Identification of alternative scenarios

Step 1a: Define alternative scenarios to the proposed CDM project activity

PP has identified the alternative scenarios for electric power and the use of biomass residues as follows:

The alternative scenarios for electric power included:

- P1: The proposed project activity not undertaken as a CDM project activity;
- P2: If applicable, the continuation of power generation in existing power-only plants fired with biomass residues, or fossil fuels, or a combination of both, at the project site. The existing power-only plants would operate at the same conditions (e.g. installed capacities, average load factors, or average energy efficiencies, fuel mixes, and equipment configuration) as those observed in the most recent three years prior to the project activity;
- P3: If applicable, the continuation of power generation in existing power-only plants fired with biomass residues, or fossil fuels, or a combination of both, at the project site. The existing power-only plants would operate with different conditions from those observed in the most recent three years prior to the project activity;
- P4: If applicable,¹ the retrofitting of existing power-only plants fired with biomass residues, or fossil fuels, or a combination of both, at the project site. The retrofitting may or may not include a change in fuel mix;
- P5: The generation of power in the grid;



VALIDATION REPORT

- P6: The installation of new power-only plants fired with biomass residues, or fossil fuels, or a combination of both, at the project site, using the same amount or less biomass residues than under scenario P1;
- P7: The installation of new power-only plants fired with biomass residues, or fossil fuels, or a combination of both, at the project site, using more biomass residues than under scenario P1;

The alternative scenarios for the use of biomass residues included:

- B1: The biomass residues are dumped or left to decay mainly under aerobic conditions. This applies, for example, to dumping and decay of biomass residues on fields;
- B2: The biomass residues are dumped or left to decay under clearly anaerobic conditions. This applies, for example, to landfills which are deeper than 5 meters. This does not apply to biomass residues that are stock-piled or left to decay on fields;
- B3: The biomass residues are burnt in an uncontrolled manner without utilizing it for energy purposes;
- B4: The biomass residues are used for electricity generation in power-only plant configuration at the project site in new and/or existing power plants;
- B5: The biomass residues are used for power and/or heat generation in other existing or new power plants at other sites;
- B6: The biomass residues are used for other energy purposes, such as the generation of bio-fuels;
- B7: The biomass residues are used for non-energy purposes, e.g. as fertilizer or as feedstock in processes (e.g. in the pulp and paper industry);
- B8: The primary source of the biomass residues and/or their fate in the absence of the project activity cannot be clearly identified.

Outcome of Step 1a: List of plausible alternative scenarios to the project activity

PP has selected the alternative scenarios B3, P1, and P5 to apply to the proposed project activity which were found acceptable. Alternative scenario B3 has been confirmed by the validation team based from the article by TC Mendoza, R Samson on the "Relative Bioenergy Potentials of Major Agricultural Crop Residues in the Philippines" Philippine Journal of Crop Science, 31(1): 11-28. April 2006 (Ref/17/). Alternative scenarios P1 and P5 have been confirmed during the site visit as well as from the list of recently built plants and their net generation capacities (Ref/22/), and (Ref/24/). Furthermore, the project is a new greenfield power plant, and hence, only scenarios P1 and P5 apply for electric power, as per the approved methodology ACM0018 Version 2.0.0 (Ref/72/)

The PP has demonstrated that B3 is the realistic and credible alternative scenario as explained in the PDD Version 5 (Ref/2/). The biomass residue (cane trash) production from sugarcane fields in Negros Island is about Six Million tons per annum which are annually burned in preparation for the following crop's season. At the project site district (Northeastern side of the island), at least 435,000 tons of cane trash is available per annum which is 200% more than what would be consumed by the power plant if it were to fire 100% biomass residue. Approved methodology ACM0018 Version 02.0.0 (Ref/72/) requires



VALIDATION REPORT

demonstration that the quantity of that type of biomass residues available in the region is at least 25% larger than the quantity of biomass residues of that type which is utilized in the region (e.g. for energy generation or as feedstock), including the project plant. This has been confirmed by the validation team from the Feasibility Study (Ref/58/); from the data publicly available at the Sugar Regulatory Administration of the Department of Agriculture http://www.sra.gov.ph/menu_statistics.html; Philippine Sugar Millers Association and the Philippine Sugar Industries, Inc., joint studies conducted by Bronzeoak Group and Booker Tate; and recent Biomass Assessment Study conducted by Biomass Resources, Inc. (Ref/7/). Widespread burning of cane trash after harvesting is rampant and can be observed during sugarcane harvesting season. Hence, the validation team confirmed that B3 is the plausible baseline scenario.

The following alternatives are not plausible scenarios:

- B1: The biomass residues are dumped or left to decay under mainly aerobic conditions. This applies, for example, to dumping and decay of biomass residues on fields
- B2: The biomass residues are dumped or left to decay under clearly anaerobic conditions. This applies, for example, to deep landfills with more than 5 meters. This does not apply to biomass residues that are stock-piled or left to decay on fields.
- B4: The biomass residues are sold to other consumers in the market and the predominant use of the biomass residues in the region/country is for energy purposes (heat and/or power generation)
- B5: The biomass residues are used as feedstock in a process (e.g. in the pulp and paper industry)
- B6: The biomass residues are used as fertilizer
- B7: The proposed project activity not undertaken as a CDM project activity (use of the biomass residues in the project plant)
- B8: Any other use of the biomass residues

Sub-step 1b: Consistency with mandatory applicable laws and regulations

The PP has applied the Philippine Policies Relevant to E+/E- Aspect of the CDM in accordance with Information note on the implementation of the E+/E- in the context of projects on the agenda of the fifty-third meeting of the CDM Executive Board – Version 01.1, EB 53, Annex 32 (Ref/70/) with respect to alternative scenarios for electric power for the following identified as realistic and credible alternatives to the project activity that are consistent with current laws and regulations:

- P1: The project carried out without the CDM;
- P5: The generation of power in existing and / or new grid-connected power plants. Without the project, the grid will continue to supply a more-GHG-intensive output.
- B3: The biomass residues are burnt in an uncontrolled manner without utilizing them for energy purposes.

The alternatives scenarios P1 and P5 has been confirmed by the validation team to comply with all applicable legislation and regulations for “Renewable Energy Act of 2008 (Republic Act 9513)” (Ref/18/) and the “Clean Air Act of 1999 (Republic Act 9749) (Ref/19/). Meanwhile, the alternative scenario B3 on the biomass residues which are burnt in an uncontrolled manner without utilizing them for energy purposes has been found



 VALIDATION REPORT

noncompliant with the Clean Air Act prohibits large-scale open burning (Sec. 20) (Ref/18/). However, the PP has justified sugarcane planters are not implementing it and would likely to continue as a common practice as confirmed by the validation team in the Article by TC Mendoza, R Samson on the “Relative Bioenergy Potentials of Major Agricultural Crop Residues in the Philippines” Philippine Journal of Crop Science, 31(1): 11-28. April 2006 (Ref/17).

Outcome of Step 1b: List of alternative scenarios to the project activity that are in compliance with mandatory legislation and regulations

Alternative scenarios P1, P5, and B3 are in compliance with mandatory legislation and regulations.

Bureau Veritas Certification hereby confirms that:

- (a) All the assumptions and data used by the project participants are listed in the PDD, including their references and sources;
- (b) All documentation used is relevant for establishing the baseline scenario and correctly quoted and interpreted in the PDD;
- (c) Assumptions and data used in the identification of the baseline scenario are justified appropriately, supported by evidence and can be deemed reasonable;
- (d) Relevant national and/or sectoral policies and circumstances are considered and listed in the PDD;
- (e) The approved baseline methodology has been correctly applied to identify the most plausible baseline scenario and the identified baseline scenario reasonably represents what would occur in the absence of the proposed project activity.

3.8.4. Algorithms and/or Formulae used to determine Emission Reductions (99-100)

The steps taken and the equations and parameters applied in the PDD to calculate project emissions, baseline emissions, leakage and emission reductions comply with the requirements of the selected methodology including applicable tool(s).

The steps taken to assess the requirement outlined in paragraph 99 – 100 of the VVS are described below:

The project applies the methodology ACM0018 Version 02.0.0 (Ref/72/) to demonstrate the emission reductions in the project relative to the baseline. In accordance with the proposed methodology, the following sections present the formulae that were used to estimate the baseline emissions, project emissions, leakage and emission reductions.

Baseline Emissions:

PP has applied the baseline emissions as calculated as follows:

$$BE_y = BE_{EL,y} + BE_{BR,y}$$

Where:

BE_y Baseline emissions in year y (tCO₂)

VALIDATION REPORT

$BE_{EL,y}$	<i>Baseline emissions due to generation of electricity in year y (tCO₂)</i>
$BE_{BR,y}$	<i>Baseline emissions due to uncontrolled burning or decay of biomass residues in year y (tCO₂)</i>

PP has determined baseline emissions through the following steps:

Step 1: Determination of $BE_{EL,y}$

Baseline emissions from electricity generation are calculated based on the net quantity of electricity generated at the project site under the project scenario ($EG_{PJ,y}$) and a baseline emission factor ($EF_{BL,EL,y}$) which expresses the weighted average CO₂ intensity of electricity generation in the baseline, as follows:

$$BE_{EL,y} = EG_{PJ,y} * EF_{BL,EL,y}$$

Where:

$BE_{EL,y}$	<i>Baseline emissions due to generation of electricity in year y (tCO₂)</i>
$EG_{PJ,y}$	<i>Net quantity of electricity generated in all power plants which are located at the project site and included in the project boundary in year y (MWh)</i>
$EF_{BL,EL,y}$	<i>Emission factor for electricity generation in the baseline in year y (tCO₂/MWh)</i>

The PP has assumed that transmission and distribution losses in the electricity grid are not influenced significantly by the project activity and are therefore not accounted for.

The PP has arrived with the calculation of the $BE_{EL,y}$ at 62,743.55 tCO₂ based on the $EG_{PJ,y}$ value at 127,011.24 MWh and $EF_{BL,EL,y}$ value at 0.494 tCO₂/MWh.

The validation team has confirmed the acceptance of the calculations and their results as validated from documents provided by the PP on Emission Reduction Calculation Model (ERCM) for Biomass residue Power Generation - San Carlos Biopower Plant <San Carlos CER – 7 Dec 2012.xl> (Ref/25/), and Luzon-Visayas Grid Emission Calculation <GEF Luzon-Visayas Ver 3.xl> (Ref/20/).

Step 1.1: Determination of $EG_{PJ,y}$

The PP has applied the following equation to calculate the net quantity of electricity generated in all power plants which are located at the project site and included in the project boundary ($EG_{PJ,y}$) as follows:

$$EG_{PJ,y} = EG_{PJ,gross,y} - EG_{PJ,aux,y}$$

Where:

$EG_{PJ,y}$	<i>Net quantity of electricity generated in all power plants which are located at the project site and included in the project boundary in year y (MWh)</i>
$EG_{PJ,gross,y}$	<i>Gross quantity of electricity generated in all power plants which are located at the project site and included in the project boundary in year y (MWh)</i>
$EG_{PJ,aux,y}$	<i>Total auxiliary electricity consumption required for the operation of the power</i>

plants at the project site (MWh)

The validation team has confirmed the application of the equation for the calculations of the $EG_{PJ,y}$ as in accordance with approved methodology ACM0018 Version 02.0.0 (Ref/72/).

The PP has arrived with the value of the $EG_{PJ,y}$ at 127,011.24 MWh which was computed from the gross capacity of the power at 18 MWh, auxiliary consumption at 10.5% of the gross capacity of the power plant, and the power load factor at 90%. The validation team has accepted the values and their calculation based on the Technical Specification of the EPC Contract (Ref/6/) and Emission Reduction Calculation Model (ERCM) for Biomass residue Power Generation - San Carlos Biopower Plant <San Carlos CER – 7 Dec 2012.xl> (Ref/25/).

Step 1.2: Determination of $EF_{BL,EL,y}$

The PP has applied the following equation to calculate $EF_{BL,EL,y}$

$$EF_{BL,EL,y} = \frac{EG_{BL,FF,y} \cdot EF_{BL,FF,y} + EG_{BL,grid,y} \cdot EF_{grid,CM,y} + EG_{BL,FF/grid,y} \cdot \text{MIN}(EF_{BL,FF,y}, EF_{grid,CM,y})}{EG_{BL,BR,y} + EG_{BL,FF,y} + EG_{BL,grid,y} + EG_{BL,FF/grid,y}}$$

Where:

$EF_{BL,EL,y}$ = Emission factor for electricity generation in the baseline in year y (tCO₂/MWh)

$EG_{BL,BR,y}$ = Amount of electricity that would be generated with biomass residues in Power only plants operated at the project site in the baseline in year y (MWh)

$EG_{BL,FF,y}$ = Minimum amount of electricity that would be generated with fossil fuels at the project site in the baseline in year y (MWh)

$EG_{BL,grid,y}$ = Minimum amount of electricity that would be generated by power plants in the electricity grid in the baseline in year y (MWh)

$EG_{BL,FF/grid,y}$ = Amount of electricity that could be generated in the baseline either by Power plants in the electricity grid or by power plants at the project site using fossil fuels in year y (MWh)

$EF_{grid,CM,y}$ = Combined margin CO₂ emission factor for grid-connected electricity generation in year y (tCO₂/MWh)

$EF_{BL,FF,y}$ = CO₂ emission factor for electricity generation with fossil fuels in power plant(s) at the project site in the baseline in year y (tCO₂/MWh)

The validation team has confirmed the application of the equation for the calculations of the $EF_{BL,EL,y}$ as in accordance with approved methodology ACM0018 Version 02.0.0 (Ref/72/).

Step 1.3: Determination of $EG_{BL,BR,y}$

The PP has provided 2 cases under Step 1.3 as follows:

Case 1: No power generation with biomass residues in the baseline.

Case 2: Power generation with biomass residues in the baseline.



The PP has applied case 1, since the identified baseline is B3 and not B4. Hence, the $EG_{BL,BR,y} = 0$ applied by the PP is accepted by the validation team which is in accordance with ACM0018 Version 02.0.0 (Ref/72/).

Step 1.4: Determination of $EG_{BL,FF,y}$

The PP has provided 4 cases under Step 1.4 on the use of fossil fuels in the baseline as follow:

- Case 1: No use of fossil fuels in the baseline.
- Case 2: No connection to the electricity grid.
- Case 3: Grid connection and historical use of fossil fuels.
- Case 4: Grid connection, no historical use of fossil fuels, and construction of a new power plant (co-)fired with fossil fuels in the baseline scenario.

The PP has applied case 1, since no fossil fuels would be used for electricity generation in the baseline scenario at the project site. Hence, $EG_{BL,FF,y} = 0$ as applied by the PP is accepted by the validation team which is in accordance with ACM0018 Version 02.0.0 (Ref/72/).

Step 1.5: Determination of $EG_{BL,grid,y}$

The PP has provided 5 cases under Step 1.5 for the minimum amount of electricity that would be generated by power plants in the electricity grid in the baseline as follows:

- Case 1: No connection to the electricity grid.
- Case 2: No electricity generation at the project site in the baseline.
- Case 3: Use of only biomass residues for electricity generation at the project site in the baseline.
- Case 4: Use of only fossil fuels for electricity generation at the project site in the baseline.
- Case 5: Use of fossil fuels and biomass residues for electricity generation at the project site in the baseline.

The PP has applied case 2, since no power plants would be operated at the project in the baseline. Hence, $EG_{BL,grid,y} = EG_{PJ,y}$ as applied by the PP is accepted by the validation team which is in accordance with ACM0018 Version 02.0.0 (Ref/72/).

Step 1.6: Determination of $EG_{BL,FF/grid,y}$

The PP has applied the equation 23 of the ACM0018 Version 02.0.0 (Ref/72/) for the determination of the $EG_{BL,FF/grid,y}$ as follows:

$$EG_{BL,FF/grid,y} = EG_{PJ,y} - EG_{BL,BR,y} - EG_{BL,FF,y} - EG_{BL,grid,y}$$

Where:

$EG_{BL,FF/grid,y}$ = Amount of electricity that could be generated in the baseline either by power plants in the electricity grid or by power plants at the project site using fossil fuels in year y (MWh)



VALIDATION REPORT

$EG_{PJ,y}$ = Electricity generated in power plants included in the project boundary in year y (MWh)

$EG_{BL,BR,y}$ = Amount of electricity that would be generated with biomass residues in power-only plants operated at the project site in the baseline in year y (MWh)

$EG_{BL,FF,y}$ = Minimum amount of electricity that would be generated with fossil fuels at the project site in the baseline in year y (MWh)

$EG_{BL,grid,y}$ = Minimum amount of electricity that would be generated by power plants in the electricity grid in the baseline in year y (MWh)

Based on the results from steps 1.3, 1.4 and 1.5, the PP has concluded as follows:

$$EG_{BL,FF/grid,y} = EG_{PJ,y} - 0 - 0 - EG_{PJ,y}$$

Hence,

$$EG_{BL,FF/grid,y} = 0$$

The validation team confirms that the acceptance of the determination of the $EG_{BL,FF/grid,y}$ is in accordance with ACM0018 Version 02.0.0 (Ref/72/).

Step 1.7: Determination of $EF_{BL,FF,y}$

The PP has considered $EF_{BL,FF,y}$ not applicable since fossil fuel power plants were not operated at the project site prior to the implementation of the project activity. Furthermore, the analysis of baseline scenario in section B.4 of the PDD Version 5 (Ref/2/) has described the project as a newly built power-only project and no power plants were operated at the project site prior to the implementation of the project in the baseline scenario. The justification made by the PP has been confirmed by the validation team based on ACM0018 Version 02.0.0 (Ref/72/).

Step 1.8: Determination of $EF_{grid,CM,y}$

The PP has determined the $EF_{grid,CM,y}$ as the combined margin CO₂ emission factor for grid connected power generation in the Luzon-Visayas Grid of the Philippines which has been found acceptable by the validation team based on Philippine grid interconnection relative to the project location at Barangay Palampas, San Carlos Ecozone, San Carlos City, Negros Occidental as validated from Power Sector Situationer 2007 by Philippine Department of Energy <http://www.doe.gov.ph/EP/Power%20Statistics.pdf> (Ref/21/). The $EF_{grid,CM,y}$ is calculated in accordance to the procedures prescribed in the latest "Tool to calculate the emission factor for an electricity system" Version 3.0.0 (Ref/73/) as required by Approved Consolidated Methodology ACM0002 Version 02.0.0 (Ref/72/). In accordance with the "Tool to calculate the emission factor for an electricity system", Version 3.0.0 (Ref/73/), the $EF_{grid,CM,y}$ is determined ex-ante as a combined margin consisting of the weighted average of the operating margin emission factor (EF_{OM}) and the build margin emission factor (EF_{BM}) as follows:

- **Operating Margin (OM):** For the calculation of the OM emission factor, PP has utilized the simple OM method ex-ante which is found justified since the low-cost must-run plants constitute less than 50% of the total grid generation on 5 year average of 26% from 2007 to 2011. Simple adjusted OM is not applicable, since the required data (i.e., the number of hours that the low-cost/must-run sources are on the margin) are not available. Likewise, the dispatch data analysis OM cannot be used,



since it is not applicable to historical data. The justification on the use of simple OM method has been validated from the data provided by Philippine Department of Energy (DoE) from the Net Generation (MWh) from 2005-2011 for Luzon and Visayas Grid Connected Power <PHIL Grid NetGen_05_11.CDM.pdf>, DOE, Philippines (Ref/22/) and from the PP GEF Excel Calculator (Ref/20/) which was provided to the validation team. $EF_{grid,OMsimple,y}$ has been calculated using the formula (1) of the “Tool to calculate the emission factor for an electricity system” (Ref/73/) for Option A. PP has used Option A2 for the calculation of the emission factor $EF_{EL,m,y}$ for each power unit using the formula (3) of the tool (Ref/73/) since only the data on net electricity generation and type of fuel are available which are confirmed by the Validation team as evidence from Net Generation (MWh) from 2005-2011 for Luzon and Visayas Grid Connected Power <PHIL Grid NetGen_05_11.CDM.pdf>, DOE, Philippines (Ref/22/). Data on fuel emission factors coal-fired (i.e. sub-bituminous), oil-based (i.e. residual fuel), and natural gas-based type power units are sourced from UNFCC using the lower 95% confidence values (Ref/23/). The selection on the types of fuels used by the power unit has been confirmed by the validation team from <Recently Built Power Plants for CDM2011.xl> DoE, Philippines (Ref/24/). Meanwhile, the values for average net energy conversion efficiency of power unit in a year ($\eta_{m,y}$) has been sourced from default efficiency factors for power in accordance with the Annex 1 of the tool (Ref/73/) and the power plants start of operations has been confirmed from <Recently Built Power Plants for CDM2011.xl> DoE, Philippines (Ref/24/). For the calculation of the OM emission factor, the vintage data for year 2009, 2010, and 2011 are used (ex-ante) by the PP wherein these data are confirmed by the Validation team as the latest available data during the time of the submission of the PDD. The OM emission factor has been calculated to be 0.563 tCO₂e/MWh (Ref/20/).

- Build Margin (BM):** PP has calculated the BM emission factor by using Option 1 ex-ante of the tool (Ref/73/) using the year 2011 which is found to be the most recent information available on units already built for the Luzon-Visayas Grid of the Philippines at the time of PDD submission to the DOE. This was confirmed by the validation team from the Philippine DoE through e-mail received dated 28/06/2012 and the review of the data attached from that e-mail which include the Net Generation (MWh) from 2005-2011 for Luzon and Visayas Grid Connected Power <PHIL Grid NetGen_05_11.CDM.pdf> (Ref/22/) and Recently Built Power Plants-2011 Net Generation in MWh <Recently Built Power Plants for CDM2011.xl> (Ref/24/). The Validation team has confirmed to be accurate the set of five power units identified by the PP to be based on Recently Built Power Plants-2011 Net Generation in MWh <Recently Built Power Plants for CDM2011.xl> (Ref/24/). Meanwhile, the electricity generation of the set of five power units ($AEG_{SET\ 5\ units}$) at 2,838,967 MWh has been confirmed by the validation team to be accurate based on the Net Generation (MWh) from 2005-2011 for Luzon and Visayas Grid Connected Power <PHIL Grid NetGen_05_11.CDM.pdf> (Ref/22/). PP has identified the sample group “m” which consists of the power plant capacity additions in the electricity system that comprise 20% of the system generation at 16,001,929 MWh. The sample group “m” is confirmed to be accurate by the Validation team to have started

to supply the Luzon-Visayas Grid of the Philippines in no than 10 years ago from the Recently Built Power Plants-2011 Net Generation in MWh <Recently Built Power Plants for CDM2011.xl> (Ref/24/). PP has calculated the BM emission factor using the formula (12) of the tool (Ref/73/) using the net quantity of electricity generated and delivered to the grid by power unit m in year ($EG_{m,y}$) using the aggregated net annual generation in MWh in the sample “m” which comprises 20% whose justification has been confirmed adequate by the validation team since, this is larger than the set of five power plant units. The BM emission factor calculation has resulted **0.393 tCO₂e/MWh** (Ref/20/) which is validated to be in accordance to the tool (Ref/73/).

- **Combined Margin (CM):** The PP has selected the default values for w_{OM} and w_{BM} as 0.5 and 0.5 respectively for the calculation of the CM emission factor ($EF_{grid,CM,y}$) using the formula (13) of the “Tool to calculate the emission factor for an electricity system” (Ref/73/). The CM emission factor is calculated to be at **0.494 tCO₂e/MWh** (Ref/20/) which is fixed ex-ante for the first crediting period. Both the selection of the default values and the calculations for the CM emission factor have been confirmed by the validation team as correct in accordance to the “Tool to calculate the emission factor for an electricity system” (Ref/73/) for the proposed Project Activity.

Step 2: Determination of baseline emissions due to uncontrolled burning of biomass residues (sugar cane trash only for this project), ($BE_{BR,y}$)

The PP has applied the equation 25 of ACM0018 Version 02.0.0 (Ref/72/) for the calculation of baseline emissions due to decay of biomass residues in year as follows:

$$BE_{BR,y} = BE_{BR,B1/B3,y} + BE_{BR,B2,y}$$

Where:

$BE_{BR,y}$ Baseline emissions due to decay of biomass residues in year y (tCO₂)

$BE_{BR,B1/B3,y}$ Baseline emissions due to aerobic decay of biomass residues in year y (tCO₂)

$BE_{BR,B2,y}$ Baseline emissions due to anaerobic decay of biomass residues in year y (tCO₂)

PP has ruled out $BE_{BR,B2,y}$ since the identified baseline scenario is B3. Therefore, $BE_{BR,y}$ is equal to $BE_{BR,B1/B3,y}$. Hence, the validation team has accepted this and found transparently presented in Emission Reduction Calculation Model (ERCM) for Biomass residue Power Generation - San Carlos Biopower Plant <San Carlos CER – 7 Dec 2012.xl> (Ref/25/).

Step 2.1: Determination of $BE_{BR,B1/B3,y}$

PP has applied the equation 26 of ACM0018 Version 02.0.0 (Ref/72/) for the determination of $BE_{BR,B1/B3,y}$ as follows:

$$BE_{BR,B1/B3,y} = GWP_{CH4} * \sum BR_{n,B1/B3,y} * NCV_{n,y} * EF_{BR,n,y}$$

Where:

$BE_{BR,B1/B3,y}$ Baseline emissions due to uncontrolled burning or anaerobic decay of



VALIDATION REPORT

GWP_{CH_4}	biomass residues in year y (tCO_2) Global Warming Potential of methane valid for the commitment period (tCO_2/tCH_4)
$BR_{n,B1/B3,y}$	Amount of biomass residues category n used in the project plant(s) included in the project boundary in year y for which B3 has been identified as the most plausible baseline scenario (tonnes on dry-basis)
$NCV_{n,y}$	Net calorific value of the biomass residues category n in year y (GJ/tonnes on dry-basis)
$EF_{BR,n,y}$	CH ₄ emission factor for uncontrolled burning of the biomass residues category n during the year y (tCH_4/GJ)
n	Categories of biomass residues

The PP has applied the values for $BR_{n,B1/B3,y}$ from year 1 to year 7 based on which were based on Fuel Supply Study, Biomass Resources Inc (June 2012) (Ref/10) which has been confirmed by the validation team. Meanwhile, the PP has applied values for GWP_{CH_4} at 21 tCO_2/tCH_4 , $NCV_{n,y}$ at 0.9730 kJ/kg (0.00973Tj/tones) on dry-basis (Ref/26/) and $EF_{BR,n,y}$ at 0.001971 tCH_4/GJ which were based on IPCC value for GWP for CH₄, Laboratory Analysis of Biomass (Ref/26/), and default value for CH₄ emission factor for uncontrolled burning of biomass from ACM0018 Version 02.0.0 (Ref/72/).

The validation team has confirmed the values and their calculations in the Emission Reduction Calculation Model (ERCM) for Biomass residue Power Generation - San Carlos Biopower Plant <San Carlos CER – 7 Dec 2012.xl> (Ref/25/) which were found acceptable and transparent.

Step 2.2: Determination of $BE_{BR,B2,y}$

The PP has applied $BE_{BR,B2,y} = 0$ due to there will be no emission from anaerobic decay of biomass as this is ruled out as baseline scenario which was confirmed by the validation team.

Project Emission (PE)

PP has applied the project emissions to be calculated in accordance with Equation 27 of the ACM0018 Version 02.0.0 (Ref/72/) as follows:

$$PE_y = PE_{FF,y} + PE_{EL,y} + PE_{TR,y} + PE_{BR,y} + PE_{ww,y}$$

Where:

PE_y	Project emissions during year y (tCO_2)
$PE_{FF,y}$	Emissions during the year y due to fossil fuel consumption (tCO_2)
$PE_{EL,y}$	Emissions during the year y due to electricity use off-site for the processing of biomass residues (tCO_2)
$PE_{TR,y}$	Emissions during the year y due to transport of the biomass residues to the project plant (tCO_2)
$PE_{BR,y}$	Emissions from the combustion of biomass residues during the year y (tCO_2)
$PE_{ww,y}$	Emissions from waste water generated from the treatment of biomass residues in year y (tCO_2)

- **Determination of $PE_{FF,y}$:** Fossil fuel will not be used in the project activity therefore $PE_{FF,y} = 0$. This parameter will be monitored.
- **Determination of $PE_{EL,y}$:** The PP has applied $PE_{EL,y} = 0$. This has been confirmed by the validation team as acceptable based on the EPC Contract Agreement (Ref/6/) where processing of biomass will take place on-site.
- **Determination of $PE_{TR,y}$:** The PP has applied the equation based on “Project and leakage emissions from road transportation of freight (EB63, Annex 10) Version 01.0.0” (Ref/74/) as follow:

$$\left. \begin{matrix} PE_{TR,m} \\ LE_{TR,m} \end{matrix} \right\} = \sum_f D_{f,m} \cdot FR_{f,m} \cdot EF_{CO_2,f} \cdot 10^{-6}$$

Where:

$PE_{TR,m}$	Project emissions from road transportation of freight Monitoring period m (t CO ₂)
$LE_{TR,m}$	Leakage emissions from road transportation of freight Monitoring period m (t CO ₂)
$D_{f,m}$	Return trip road distance between the origin and destination Of freight transportation activity f in monitoring period m (km)
$FR_{f,m}$	Total mass of freight transported in freight transportation activity f in Monitoring period m (t)
$EF_{CO_2,f}$	Default CO ₂ emission factor for freight transportation activity f (gCO ₂ / t km)
f	Freight transportation activities conducted in the project activity in monitoring period m

The emission factor applied for freight transportation activities is at 0.000129 tCO₂/tkm for heavy vehicles which have been confirmed by the validation team as in accordance with “Project and leakage emissions from road transportation of freight (EB63, Annex 10) Version 01.0.0” (Ref/74/). The assumption for $D_{f,m}$ is based on round trip distance from collection site to power and back to the collection site. The weights of biomass are derived from cane trash, woody ECP, grassy ECP, woody residues, and other biomass. The validation team has confirmed the source of data in the CER Calculator Excel Spreadsheet (Ref/25/) to be accurate and transparent based on Fuel Supply Study, Biomass Resources Inc (June 2012) (Ref/10/). The validation team has also confirmed equation applied for the Emission Reduction Calculation Model (ERCM) for Biomass residue Power Generation - San Carlos Biopower Plant <San Carlos CER – 7 Dec 2012.xl> (Ref/25/) for the $PE_{TR,y}$ to be in accordance with ACM0018 Version 02.0.0 (Ref/72/).

- **Determination of $PE_{BR,y}$:** The PP has applied the equation in accordance with ACM0018 Version 02.0.0 (Ref/72/) as follows:

$$PE_{BR,y} = GWP_{CH_4} * EF_{CH_4,BR} \sum BR_{PJ,n,y} * NCV_{n,y}$$

Where:

$PE_{BR,y}$	Emissions from the combustion of biomass residues during
-------------	--

VALIDATION REPORT

	<i>the year y (tCO₂)</i>
GWP_{CH_4}	<i>Global Warming Potential for methane valid for the relevant commitment period (tCO₂/tCH₄)</i>
$EF_{CH_4, BR}$	<i>CH₄ emission factor for the combustion of biomass residues in the project plant (tCH₄/GJ)</i>
$BR_{PJ, n, y}$	<i>Quantity of biomass residues of category n used in power plants which are located at the project site and included in the project boundary in year y (tonnes on dry-basis/yr)</i>
$NCV_{n, y}$	<i>Net calorific value of the biomass residues category n in year y (GJ/tonnes on dry-basis)</i>

The PP has applied the GWP_{CH_4} at 21 tCO₂/tCH₄ which has been found acceptable. The $EF_{CH_4, BR}$ applied is 0.04110 tCH₄/TJ which is confirmed by the validation team as default value in accordance with ACM0018 Version 02.0.0 (Ref/72/). The $BR_{PJ, n, y}$ applied has been confirmed by the validation team as based on Supply Plan for cane trash only (Ref/10/). The value of $NCV_{n, y}$ applied is based value provided by the EPC contractor (Ref/26/). The validation team has confirmed the values and calculation in the Emission Reduction Calculation Model (ERCM) for Biomass residue Power Generation - San Carlos Biopower Plant <San Carlos CER – 7 Dec 2012.xl> (Ref/25/) which were found acceptable and transparent.

- **Determination of $PE_{ww, y}$:** The PP has excluded the $PE_{ww, y}$ with justification that biomass residues will not require specific treatment before combustion. The validation team has confirmed this based on EPC Contract Agreement (Ref/6/) and Fuel Supply Study (Ref/10/) which were found acceptable.

Since $PE_{FF, y} = 0$, $PE_{EL, y} = 0$ and $PE_{ww, y} = 0$

Therefore, the project emission PE_y to be applied is as follow:

$$PE_y = PE_{TR, y} + PE_{BR, y}$$

Leakage Emission

The PP has the equation 20 of ACM0018, Version 02.0.0 (Ref/72/) as follows :

$$LE_y = EF_{CO_2, LE} \cdot \sum BR_{PJ, n, y} \cdot NCV_{n, y}$$

Where:

LE_y	<i>Leakage emissions in year y (tCO₂/yr)</i>
$EF_{CO_2, LE}$	<i>CO₂ emission factor of the most carbon intensive fossil fuel used in the country (tCO₂/GJ)</i>
$BR_{PJ, n, y}$	<i>Quantity of biomass residues of category n used in power plants which are located at the project site and included in the project boundary in year y (tonnes on dry-basis/yr)</i>
$NCV_{n, y}$	<i>Net calorific value of the biomass residues category n in year y (GJ/ton of dry matter)</i>
n	<i>Categories of biomass residues for which B5:, B6:, B7: or B8: has been identified as the baseline scenario</i>

VALIDATION REPORT

The PP has not included the leakage emission with justification that the biomass baseline is B3 which does not apply for the equation. Leakage emission is only applicable categories of biomass residue whose baseline scenario has been identified as B5, B6, B7, or B8. Hence, the validation team confirms the exclusion of the leakage emission in the calculations.

Emission Reductions:

PP has applied the emission reductions calculation follows:

$$ER_y = BE_y - PE_y - LE_y$$

Where:

ER_y = Emissions reductions during year y (tCO₂)

BE_y = Baseline emissions during year y (tCO₂)

PE_y = Project emissions during year y (tCO₂)

LE_y = Leakage emissions during year y (tCO₂)

Based on the calculations and results presented in the sections above the implementation of the project activity will result in an average ex-ante estimation of Average annual emission reduction conservatively calculated to be 64,088 tCO₂e per year for the selected crediting period.

Bureau Veritas Certification hereby confirms that:

- (a) All assumptions and data used by the project participants are listed in the PDD, including their references and sources;
- (b) All documentation used by project participants as the basis for assumptions and source of data is correctly quoted and interpreted in the PDD;
- (c) All values used in the PDD are considered reasonable in the context of the proposed project activity;
- (d) The baseline methodology and corresponding tool(s) have been applied correctly to calculate project emissions, baseline emissions, leakage and emission reductions;
- (e) All estimates of the baseline emissions can be replicated using the data and parameter values provided in the PDD.

3.9. Additionality (104)

As required by the selected methodology, the additionality of the Project has been demonstrated by applying the steps required by Section "Procedure for the selection of the baseline scenario and demonstration of additionality" of the approved methodology ACM0018 Version 02.0.0 (Ref/72/).

The steps taken and sources of information used, to cross-check the information contained in the PDD on this matter are described below:

VALIDATION REPORT

PP has presented step by step approached prescribed by the approved methodology ACM0018 Version 02.0.0 (Ref/72/) in the Section B.5 of the PDD Version 5 (Ref/2/). The validation team hereby confirms that out-comes of the each step are determined correctly and relevant evidences are provided to validation team for validation. Based on the evidences checked, validation team confirms that out-comes are credible and justified adequately. Details of validation are provided in following Sections 3.9.2, 3.9.3 and 3.9.5 of this Validation Report to confirm that the proposed large scale project is additional.

3.9.1.Prior consideration of the Clean Development Mechanism (112)

The timeline of the Project has been validated as in Table 4 below:

Table 4: Timeline of the Project

Date	Events	Reference
February 2009	Feasibility Study	(Ref/58/)
03/07/2009	Stakeholders Consultation with Barangay Officials	(Ref/46/), and (Ref/47/)
28/07/2009	Stakeholders Consultation with City Officials	(Ref/46/), and (Ref/47/)
17/03/2011	Contract signing with SEEDLinks Philippines, Inc. as CDM Consultant	(Ref/57/)
22/03/2011	CDM Prior Consideration Form submitted to the DNA	(Ref/43/)
22/07/2011	Stakeholders Consultation	(Ref/46/), and (Ref/47/)
23/07/2011	Consultation with the City Councilors	(Ref/46/), and (Ref/47/)
10/08/2012	EPC Contract Agreement for SCBP Power Plant	(Ref/6/)

From the table above, the validation team is able to verify that the project activity start date which is the awarding of the EPC Contract to the project activity on 10/08/2012 is appropriate and is the earliest of the dates at which either the implementation or construction or real action of the Project began. This is in accordance with the latest CDM glossary (Ref/76/).



The PDD has been published for global stakeholder consultation on 17/07/2012 before the project activity start date.

Bureau Veritas Certification hereby confirms that the proposed project activity complies with the requirements related to the prior consideration of the CDM.

3.9.2. Identification of Alternatives (116)

The plausible and credible alternatives to the Project were identified as per stepwise procedure in accordance with the Approved Consolidated Methodology ACM0018 Version 02.0.0 (Ref/72/). Refer to the above Section 3.8.3 of this Validation Report for the identification of the alternatives to the proposed project activity.

Bureau Veritas Certification considers the listed alternatives to be credible and complete.

3.9.3. Investment Analysis

Analysis method

As mentioned in the Section 3.9 of this report above, PP has demonstrated the additionality of the project using approved methodology ACM0018 Version 02.0.0 (Ref/72/) and opted Investment analysis approach to prove the additionality. Detailed validation steps as per the selected tool are mentioned below.

Since the project involves electricity generation and revenues come from the sale of electricity to the grid, PP has selected benchmark analysis approach to evaluate the financial viability of the project as there are no other alternative investments that will be available for the PP. Hence, a benchmark analysis is applied and considered to be appropriate.

Benchmark

The PP has selected the Equity IRR (EIRR) with the benchmark return on equity (ROE) which is found in accordance with the EB Guideline on Assessment of Investment Analysis, Version 05, EB 62 (Ref/75/). The PP has explained how benchmark ROE is obtained and provided transparent selection of the value at 20% which was confirmed by the validation team based on the Feasibility Study (Ref/58/), United Nations Environmental Programme: Private Financing of Renewable Energy – A Guide for Policy Makers (co-produced by UNEP Sustainable Energy Finance Initiative, Bloomberg Energy Finance and Chatham House) http://sefi.unep.org/fileadmin/media/sefi/docs/publications/Finance_guide_FINAL-.pdf (Ref/50/), Valuation Box from RCBC <http://www.rcbcsec.com/secured/admin/download/August%2024%202012%20Valuation.pdf>, (Ref/51/), <http://www.greenprospectsasia.com/content/maybank-meacp-stays-dollars-sense-and-profitability> (Ref/52/), Letter dated 31 August 2011 to San Carlos Biopower Inc from Thomas-Llloyd Capital LLC (Ref/53/), ERC Case No. 2011-138 RC Decision (Ref/55/), ERC Case No. 2011-006 RM http://www.erc.gov.ph/cgi-bin/issuances/files/Decision_ERCCaseNo.2011-006RM_NREB_pp81-90.pdf (Ref/54/), and ERC Case No. 2011-138RC http://www.erc.gov.ph/cgi-bin/issuances/files/Decision_ERCCaseNo.2011-138RC_SOCOTECO_SECpp41-75.pdf (Ref/55/).

VALIDATION REPORT

This approach of calculating Benchmark value is found acceptable and is in accordance with EB Guideline on Assessment of Investment Analysis, EB 62, Annex 05 (Ref/75/).

The validation team considers that the type of benchmark applied is suitable for the type of financial indicator presented; the risk premiums applied in determining the benchmark reflect the risks associated with the project activity; it is reasonable to assume that no investment would be made at a rate of return lower than the benchmark.

Data source

The input values are taken from the Project EIRR which was compiled by the PP. The validation team confirms that the values used in the PDD and associated annexes are fully consistent with the Project EIRR.

Input value

The validation team has reviewed the EIRR calculation sheet or Project Financial Model calculation sheet (Ref/27/), and Feasibility Study (Ref/58/) and cross-checked the major input values using local knowledge as well as sectoral and financial expertise and confirms that:

- **Total annual net electricity generation:**
As mentioned in the PDD Section A.1 the Project Activity will be the installation of new 18 MW biomass power plant. The validation team has cross-checked the installed capacity of the project from the EPC Contract Agreement (Ref/6/) provided by the PP. The calculation of the annual net electricity generation was found correct and hence accepted.
- **Power Load Factor:**
Power load factor (PLF) has been applied at 90%, based on EPC Contract Agreement (Ref/6/) technical specification. The PLF considered is in accordance with the requirements as specified by EB 48, Annex 11 (Ref/71/).
- **Total Investment Cost:**

The plant capital costs consisted of EPC contract at PHP 1,512,847,358.00 based on the EPC Contract Agreement for SCBP Power Plant dated 10 August 2012 between SCBP and Wuxi Huaguang Electric Power Engineering Co., Ltd (WUXI-HEPECL) (Ref/6/). The non-EPC contract costs was at PHP 251,915,429.00 which consisted of Factory Site Mobile Equipment, Tools, Spare Parts and Consumables, Additional Bldg, . Site Dev. & Civil Works, Fuel Processing Equipment., Owner's Engineer Costs, Bridge without Fence and Site Set-up. The values provided by the PP on the PDD Version 5 (Ref/2/) and Financial Model (Ref/27/) were confirmed transparent and accurate based on the SJR Industrial Construction Miscellaneous Civil and Structural Works proposal dated 11/08/2012 (Ref/29/), West Machinery Proposal No. M072311-1 for Farm Machinery dated 23/07/2011 (Ref/30/), Regreen Enterprises Pvt Ltd Proposal on Project Execution Management Services dated 26/08/2012 (Ref/31/), Rotogrind Quotation for Fuel Processing Equipment dated 20/08/2010 (Ref/32/). Conversion factor at PHP

VALIDATION REPORT

42.60 to USD 1.00 applied for cost quoted in USD to PHP was confirmed by the validation team as acceptable from <http://www.investing.com/currencies/usd-php-historical-data> (Ref/49/)

- **Period of financial assessment:**

PP has applied 20 years as the period of financial assessment. The equipment lifetime for this project is considered as 25 years, which has been cross-checked by Validation Team based on equipment life time in accordance with the “Tool to determine the remaining lifetime of equipment” Version 01, EB 50, Annex 15 (Ref/77/).

- **Revenues:**

The revenue component of the EIRR calculation has applied the sale of electricity to the Grid. PP has applied Electricity Tariff of PHP 6.63/KWh based on the Philippine Energy Regulatory Commission Resolution No. 10, Series of 2012 on Resolution Approving the Feed-in-Tariff http://www.erc.gov.ph/cgi-bin/issuances/files/ResolutionNo.10Seriesof2012_FIT.pdf (Ref/38/). The annual revenue in terms of electricity sales in the Financial Model (Ref/27/) has been validated which considered the plant availability factor at 90% in the calculation and found correctly applied and hence accepted.

- **Equity:**

The Cost of debt is not considered in the beginning thus the gross profit margin used in the calculation of the E-IRR is in the Project Financial Model calculation sheet (Ref/27/) is found accurate. Verification of the amount was conducted in the financial model under the cash flow sheet that such variable is not part of the Gross profit margin and the model (Ref/27/) shows such variable deduction was only treated once as presented in IRR sheet of the financial model (Free Cash).

- **Debt Repayment Tenure:**

The PP has applied the debt equity ratio for the the proposed project activity at 70%. This was confirmed by the validation team based on Preliminary terms and conditions from San Carlos Biopower, Inc. Debt Term Sheet from ThomasLloyd Capital LLC (Ref/56/) and Project Financial Model calculation sheet (Ref/27/). The debt repayment tenure considered in the investment analysis is 12.5 years which is based on the San Carlos Biopower, Inc. Debt Term Sheet from ThomasLloyd Capital LLC (Ref/56/). The indicative sheet was applicable and available at the time of investment decision and hence the same is accepted by the validation team.

- **Taxes:**

PP has applied the 10% Corporate income as tax with tax holidays for 7 years as per Philippines Renewable Energy Act of 2008 (Ref/18/). Other taxes that the PP applied included 1.50% real property taxes on net fixed assets as per Renewable Energy Law Section 15.C; and 1.5% of gross revenue for government share as per Renewable Energy Law Section 13. The Validation Team has confirmed the sources of data have been complete and obtained from current regulatory requirements.

**Indicator Calculation**

Based on the input values from the EIRR for the Project Activity that are valid and applicable at the time of investment decision, the EIRR for Project Activity without CDM revenues is at 17.17% which is lower than the 20% benchmark ROE. This shows that the Project is not financially attractive in the absence of CDM benefits.

The validation team has reviewed the Project Financial Model calculation spreadsheet (Ref/27/) and confirms that the calculation and presentation are consistent with the "Guidelines on the assessment of investment analysis" version 05, EB 62 (Ref/75/). The data sources as well as the analysis approaches are reliable and in accordance with local accounting regulations and/or international best practice.

The EIRR calculation was reviewed by the appointed financial expert and it is confirmed that the Project IRR calculation is correct.

Sensitivity Analysis

Variables including the initial investment cost, that constitute more than 20% of either total project costs or total project revenues were taken as uncertainty factors for sensitive analysis to determine under what conditions variations in the result would occur, and the likelihood of these conditions. PP has selected 5 parameters to perform the sensitivity analysis and the result of sensitivity analysis presented in the PDD is reproduced as below:

- **Electricity output:** The PP has applied an increase of 4.36% in order to reach the benchmark at 20%. However, this is not possible since the feed-in-tariff (FIT) for biomass projects is set at PHP 6.63/kWh for the next 20 years based on Philippine Energy Regulatory Commission – Resolution No. 10 Series of 2012 – Resolution Approving the Feed-In Tariff Rate http://www.erc.gov.ph/cgi-bin/issuances/files/ResolutionNo.10Seriesof2012_FIT.pdf (Ref/38/) which was issued on 27/06/2012. This resolution (Ref/38/) is applicable to projects that will come on-line 3 years from the FIT implementation wherein in the project activity will be implemented. Furthermore, the resolution (Ref/38/) will provide for the reduction of the FIT overtime on the basis of a 0.5% depression rate 2 years from the effectivity of the FIT rules. Hence, an increase of 4.36% in the FIT is not possible as tariff will be decreased.
- **Biomass fuel cost:** The 10% decrease in the biomass fuel will not raise the Project IRR to reach the 20% benchmark. The Project IRR has to be reduced at 15.25% in order to reach the 20% benchmark. Such scenario is not realistic based on the upward trend in Consumer Price Index from National Statistical Coordination Board from January 2004 to October 2012 http://www.nscb.gov.ph/secstat/d_price.asp (Ref/59/).
- **Annual Operating Hours:** The annual operating hours has to be increased by 5% to reach 20.41% IRR. However, this is not possible because since the maximum guaranteed hours of 8,200 hours will be exceeded (i.e. 5% increase of 7,884 hours load factor specification will result to 8,270 hours). , which is above the maximum guaranteed hours of 8,200 hours. An additional 5% (394 hours) on the projected 7884 hours of operation per annum, [assuming 438 hours of planned shutdown](#) for



VALIDATION REPORT

maintenance, means it will exceed the plant's maximum availability of 8,200 hours. This is not realistic.

- **O&M Costs (excluding fuel cost):** The 10% decrease in the O&M cost excluding fuel cost will not reach 20% benchmark.
- **Static Investment Cost:** The 10% decrease in the static investment cost is not likely since the EPC Contract/Agreement (Ref/6/) has been awarded with the EPC contractor was signed at a fixed cost where this comprised the 49% of the static cost. Hence, the reduction of 10% of the total static investment cost translates into a decrease by approximately 20% in all the non-EPC cost items before the benchmark return is reached which is not considered feasible.

The PP has justified the applied Variation of $\pm 10\%$ to the identified parameters and it is found appropriate confirmed by the validation team from the Project Financial Model calculation sheet (Ref/27/). Hence Validation team concludes that the applied variation for the sensitivity analysis is in accordance with local financial guideline as well as EB 62, Annex 05 (Ref/75/).

The validation team considers that the range of variations is reasonable in the project context. The analysis provided a cross-check on the suitability of the assumptions used in the development of the investment analysis. The conclusion that the project activity is unlikely to be the most financially/economically attractive is robust to reasonable variations in the critical assumptions.

Bureau Veritas Certification hereby confirms that the underlying assumptions regarding investment analysis are appropriate and the financial calculations are correct.

3.9.4.Barrier Analysis (127)

The PP has used the barrier analysis to demonstrate the additionality of the Project following the Step 2 required by the approved methodology ACM0018 Version 02.0.0 (Ref/72/). The identified barriers include:

- **Investment Barriers:** The PP has applied investment barriers to the identified alternative scenario P1. The Equity IRR of 17.17% was determined by the PP to be below the benchmark of 20% Equity IRR. With this barrier, P1 is eliminated as a baseline scenario. CDM alleviates this situation and will increase the Equity IRR to 19.26% which was still lower than the Equity IRR. Thus, the alternative scenario for electric power is that the equivalent electricity supply would be generated by the power grid (P5).
- **Technological Barriers:** The project is found to be the first-of-its kind in the Philippines in terms of scale (size) as a stand-alone biomass power generation plant and its multi-fuel boiler design as confirmed by the validation team from the list of the Renewable Energy Registration and Accreditation for Biomass Projects in the Philippines <http://www.doe.gov.ph/RE%20Regis&accred/Awarded%20Contracts.htm> (Ref/42/). Most of the biomass power generation plants are cogeneration and are small-scale. The boiler allows also firing of multiple biomass fuel including agricultural residues that are



by-nature high in alkali as confirmed by the validation team from technical specification of the power plant in the EPC Contract/Agreement (Ref/6/) and article by J Werther, et al on "Combustion of agricultural residues." *Progress in energy and combustion science* (Ref/60/). The boiler technology and equipment for efficient gathering and collection of biomass residues are available only abroad and would have to be imported into the Philippines as confirmed by the validation team from Section 21c, 22 and 23 of Philippine Renewable Energy Act of 2008 (Republic Act 9513) (Ref/18/).

The validation team confirms that issues that have a direct impact on the financial returns of the project activity are not considered barriers and have been assessed by investment analysis.

Based on the assessment above, the validation team concludes that the presented barriers are real and the barriers prevent the implementation of the project activity but not the implementation of at least one of the possible alternatives, in particular the identified baseline scenario.

Bureau Veritas Certification hereby confirms that the barrier analysis performed is credible.

3.9.5.Common Practice Analysis (130)

The PP has applied the common practice analysis in accordance with the Step 4 of the approved methodology ACM0018 Version 02.0.0 (Ref/72/).

Step 4 of the ACM0018 Version 02.0.0 (Ref/72/) states that "Similar activities are defined as activities (i.e. technologies or practices) that are of similar scale, take place in a comparable environment, *inter alia*, with respect to the regulatory framework and are undertaken in the relevant geographical area, as defined in Sub-step 1a above." The PP has provided a common analysis in the Section B.4 and Appendix 8 of the PDD version 5 (Ref/2/) on the awarded biomass projects including those that are already implemented and currently underway biomass projects based on latest data coming from the Philippine DoE's Renewable Energy Registration and Accreditation for Biomass Projects in the Philippines <http://www.doe.gov.ph/RE%20Regis&accred/Awarded%20Contracts.htm> (Ref/42/). The PP's common practice analysis on the currently installed biomass project has excluded those biomass projects that were already CDM registered projects which have been confirmed by the validation team from the UNFCCC website. As shown in Table 5, the PP has included 5 non-CDM registered already implemented biomass projects as follows:

Table 5: Non-CDM Registered Biomass Renewable Energy Operating Contract

No.	Name of Biomass Renewable Energy Operating Contract	Fuel	MW
1	7.2 MW Rice Hull Gasification (Isabela)	Rice hull	3.6
2	4 MW San Pedro Landfill Methane Recovery and Electricity Generation (Laguna)	Biogas	4



VALIDATION REPORT

3	15 MW CASA Bagasse-Fired Cogeneration Facility (Iloilo)	Bagasse	15
4	26 MW VMCI Bagasse-Fired Cogeneration Plant (Negros Occidental)	Bagasse	18
5	21 MW CSCI Bagasse-Fired Cogeneration Facility (Bukidnon)	Bagasse	21

Based on the above Table, the validation team has confirmed acceptable, the PP analysis that:

- 1) There is no power plant yet which utilizes cane trash as fuel, and
- 2) There is no power plant yet which employs a multifuel boiler.

The PP has also applied common practice analysis on 4 prospective multi-fuel biomass projects other than the project activity as listed in the latest data coming from the Philippine DoE's Renewable Energy Registration and Accreditation for Biomass Projects in the Philippines <http://www.doe.gov.ph/RE%20Regis&accred/Awarded%20Contracts.htm> (Ref/42/) which was confirmed by the validation team as acceptable as shown in Table 6 below.

Table 6: Prospective Multi-fuel Biomass Projects

No.	Prospective multifuel biomass projects	Location	Project Status	Fuel
1	17.5 MW Nueva Ecija Multi-Fuel Biomass Power Generation Facility (<i>Green Power Nueva Ecija Phils, Inc.</i>)	Nueva Ecija (island of Luzon)	No installed capacity yet	Rice straw and husks, corn straw and cobs, sugar cane tops and leaves, coconut wastes Note: The province of Nueva Ecija, however, is not known as a sugarcane producer.
2	12 MW Aklan Multi-Fuel Biomass Power Plant (<i>Asea One Power Corp.</i>)	Aklan (island of Panay)	No installed capacity yet	Mainly rice husks
3	30 MW Ajuy Multi-Fuel Biomass Power Generation Project (<i>Asea One Power Corp.</i>)	Iloilo (island of Panay)	No installed capacity yet	Rice stalks, rice husks and wood chips such as sibucao and madre de cacao, bagasse from muscovado and coconut husks.
4	30 MW Ajuy Multi-Fuel Biomass Power Generation Project (<i>Green Power Panay Phils, Inc.</i>)	Iloilo (island of Panay)	No installed capacity yet	Rice husks, rice straws, corn cobs, corn straws

Based on the Table above, the validation team has confirmed that the project activity is not a common practice in terms of geographical area (i.e. the project activity is the only biomass project located in the island of Negros), and the only project that will utilize cane trash as primary fuel based on Green Power Nueva Ecija Philippines Inc. web-site <http://www.green-power-nuevaecija.com> (Ref/61/), Number of Sugarcane Farms by Farm size for Crop Year 2009-2010 from Philippine Sugar Regulatory Agency http://www.sra.gov.ph/archive_stat/upd_Farms%20by%20farm%20size.pdf (Ref/62/), 12MW – Aklan Biomass Power Plant data from Philippine National Economic Development Agency (NEDA) http://www.neda-rcd6.ph/site/rpmc6/on_PowGen_Biomass-ASEA.pdf (Ref/63/), <http://www.alternative.com/biofuel/2008/12/19/asea-one-power-corp-announces-biomass-energy-plants/> (Ref/64/), and ECC for Green Power Panay Phils, Inc. <http://202.57.47.221/internal/Secured/Uploads/ECC/0ddd3bb7-9716-417b-9bf9-73843d10091b.pdf> (Ref/65/).

Furthermore, the PP has applied that it is not a common practice in the Philippines to collect cane trash for fuel utilization because it is characterized as (1) low-density biomass making it not feasible to haul from long distance due to transport cost; and (2) the high-alkali nature of the material prevents the existing boilers of the sugar mills to utilize it as fuel because it will cause slagging and fouling. The validation team has confirmed this acceptable based on Werther, J., et al. "Combustion of agricultural residues." *Progress in energy and combustion science* 26.1 (2000): 1-27 (Ref/60/), and Jenkins, B. M., L. L. Baxter, and T. R. Miles. "Combustion properties of biomass." *Fuel Processing Technology* 54.1 (1998): 17-46. Available at <http://www.et.byu.edu/~tom/classes/733/ReadingMaterial/Jenkins-Baxter.pdf> (Ref/66/).

Bureau Veritas Certification hereby confirms that the proposed CDM project activity is not common practice.

In conclusion, as demonstrated in accordance with approved methodology ACM0018, Version 02.0.0, the proposed CDM project activity is additional.

3.10. Monitoring Plan (133)

The Project uses the approved consolidated monitoring methodology ACM0018 Version 02.0.0 (Ref/72/).

Applicability of this methodology is justified in PDD as the project activity involves installation of an 18MW biomass power plant to the Luzon-Visayas Grid of the Philippines. Biomass energy is considered as the renewable energy and hence the methodology selected by PP is justified. Referring to the discussions on the applicability of the methodology in Section 3.8.1 above, the validation team considers that the selected monitoring methodology is applicable to the Project.

Data and Parameters Monitored

Table 7: Data and Parameters Monitored

Data Parameter	Unit	Description	Applicability
Biomass residues	Type (i.e. bagasse, rice husks, empty fruit	Explain and document transparently in the CDM-PDD, using a table similar to	Yes



VALIDATION REPORT

categories and quantities used in the project activity	bunches, etc.); • Source (e.g. produced on-site, obtained from an identified biomass residues producer, obtained from a biomass residues market, etc.); • Fate in the absence of the project activity (Scenario B); • Use in the project scenario (Scenario P); • Quantity (tonnes on dry-basis)	<p>Table 2, which quantities of which biomass residues categories are used in which installation(s) under the project activity and what is their baseline scenario.</p> <p>The last column of Table 2 corresponds to the quantity of each category of biomass residues (tonnes on dry-basis). These quantities should be updated every year of the crediting period as part of the monitoring plan so as to reflect the actual use of biomass residues in the project scenario. These updated values should be used for emissions reductions calculations.</p> <p>Along the crediting period, new categories of biomass residues (i.e. new types, new sources, with different fate) can be used in the project activity. In this case, a new line should be added to the table. If those new categories are of the type B1:, B2: or B3:, the baseline scenario for those types of biomass residues should be assessed using the procedures outlined in the guidance provided in the procedure for the selection of the baseline scenario and demonstration of additionality</p>	
$BR_{PJ,n,y}$	tonnes on dry-basis	Quantity of biomass residues of category n used in power plants which are located at the project site and included in the project boundary in year y	Yes
$BR_{n,B1/B3,y}$	tonnes on dry-basis	Amount of biomass residues category n used in the project plant(s) included in the project boundary in year y for which B1 or B3 has been identified as the most plausible baseline scenario	Yes
For biomass residues categories for which scenarios B1:, B2: or B3: is deemed a plausible baseline alternative, project participants shall demonstrate	Tones	<ul style="list-style-type: none"> Quantity of available biomass residues of type n in the region Quantity of biomass residues of type n that are utilized (e.g. for energy generation or as feedstock) in the defined geographical region Availability of a surplus of biomass residues type n (which cannot be sold or utilized) at the ultimate supplier to the project and a representative sample of other suppliers in the defined geographical region 	Yes



VALIDATION REPORT

that this is a realistic and credible alternative scenario			
$BR_{TR,y}$	tonnes on dry-basis	Quantity of biomass residues that would be fired in biomass-residue-only heat generators (of power-only plants) in the baseline in year y	Yes
$EG_{PJ,gross,y}$	MWh	Gross quantity of electricity generated in all power plants which are located at the project site and included in the project boundary in year y	Yes
$EG_{PJ,aux,y}$	MWh	Total auxiliary electricity consumption required for the operation of the power plants at the project site	Yes
$NCV_{n,y}$	GJ/tonnes on dry-basis	Net calorific value of biomass residues of category n in year y	Yes
$EF_{BR,n,y}$	tCH ₄ /GJ	CH ₄ emission factor for uncontrolled burning of the biomass residues category n during the year y	Yes
AVD_y	Km	Average round trip distance (from and to) between biomass fuel supply sites and the project site	Yes
$EF_{km,y}$	tCO ₂ /km	Average CO ₂ emission factor for the trucks during the year y	Yes
TL_y	Tonnes	Average load of the trucks used for transportation of biomass	Yes
$EF_{FF,i,y}$	tCO ₂ /GJ	CO ₂ emission factor for fossil fuel type i in year y	Yes
$NCV_{i,y}$	GJ/mass or volume unit	Net calorific value of the fossil fuel type i in year y	Yes
$EF_{CH_4,BF}$	tCH ₄ /GJ	CH ₄ emission factor for the combustion of biomass residues in the project plant	Yes
Consumption of Lignite as start-up/back-up fuel	Tons	Tons of lignite consumed as start-up/back-up fuel	Yes

The validation team considers that the description of the monitoring plan described in Section B.7.1 of the PDD Version 5 (Ref/2/) contains all necessary parameters, that they are described and that the means of monitoring described in the plan complies with the requirements of the methodology including applicable tool(s).

Implementation of the Monitoring Plan

Operational management for the Project activity is comprehensively detailed in the Section 7.1 of the PDD and this includes description of the responsibility, training, procedure reference, equipment details; calibration frequency maintenance needs are clearly

VALIDATION REPORT

mentioned. Archiving of the records was indicated and Validation team is of opinion that the retrievability of the CDM project activity records is pro-actively considered satisfactorily.

The validation team considers that the means of implementation of the monitoring plan, including the data management and quality assurance and quality control procedures, are sufficient to ensure that the emission reductions achieved by/resulting from the proposed project activity can be reported ex post and verified.

Bureau Veritas Certification hereby confirms that the monitoring plan complies with the requirements of the methodology including applicable tool(s), the monitoring arrangements described in the monitoring plan are feasible within the project design and the project participants are able to implement the described monitoring plan.

Sampling plan

According to the “Standard for Sampling and Surveys for CDM Project Activates and Programme of Activities” Version 03.0 (Ref/78/), a sampling plan has been elaborated in the PDD.

The parameters in the project activity for which sampling will be conducted include the following:

- Availability of biomass residues;
- $BR_{TR,y}$ (Quantity of biomass residues transported to the project site during the year y);
- $NCV_{n,y}$ (Net calorific value of biomass residues of category n in year y);
- AVD_y (Average round trip distance (from and to) between biomass fuel supply sites and the project site);
- TL_y (Average load of the trucks used for transportation of biomass); and
- $EF_{CH_4,BR}$ (CH_4 emission factor for the combustion of biomass residues in the project plant).

The sampling for each parameters mentioned above have included objectives and reliability requirements, target population, sampling method, sample size and sampling Frame. The procedure and location of the sampling for each parameter has been explained in Section B.7.1 of the PDD.

The validation team has validated the sampling plan and confirms that it will provide parameter value estimates in an unbiased and reliable manner based on:

- (a) The proposed sample size and sampling method are adequate to achieve the 95/100 confidence/precision requirements;
- (b) The proposed sampling plan will ensure that samples are randomly selected and are representative of the population.

Bureau Veritas Certification hereby confirms that the monitoring plan complies with the requirements of the methodology including applicable tool(s), the monitoring arrangements described in the monitoring plan are feasible within the project design and the project participants are able to implement the described monitoring plan.



3.11. Environmental Impacts (137)

The validation team has confirmed that an initial environmental examination (IEE) report was prepared as required for application and approval by the Philippine Department of Environment and Natural Resources (DENR). The project was categorized by the DENR as a Non-Critical Project in a Critical Area and an Environmental Clearance Certificate (ECC) No. R6-0912-393-4220 was issued (Ref/14/). The environmental impact results from the Project have been identified and analyzed in the PDD.

By means of checking IEE report (Ref/44/) and the approved ECC (Ref/14/), the validation team is able to ensure that the environmental impacts occur during both construction and operation period. All above impacts would be within an acceptable limit by carrying out corresponding mitigation measures as per statement of the IEE.

Bureau Veritas Certification hereby confirms that the project participants have undertaken an analysis of environmental impacts and an environmental impact assessment in accordance with procedures as required by the host Party.

3.12. Local Stakeholder Consultation (140)

The PP has completed a local stakeholder consultation process and that due steps were taken to engage stakeholders and solicit comments for the proposed project activity. PP has invited relevant stakeholders for local stakeholders' consultation, through invitation letters (Ref/45/) and announcement postings at the highly visible areas in the City Hall, Barangay Hall, Public Market and other public places which were given in advance for the scheduled public consultation meetings with the Barangay residents and officials on 03/07/2009 and 22/07/2011, and City Officials on 28/07/2009. The Validation Team has verified all the letters sent and respective "confirmation of receipts" with evidence provided by the PP. Participants from following groups attended the public consultation:

- Local residents from the host community of the proposed project, i.e. Barangay Palampas, San Carlos City, Negros Occidental.
- Local government officials of the host communities (barangays), and host city (i.e. San Carlos City, Negros Occidental)
- Representatives from local government agencies
- Representatives from the local media, academe, non-government organizations.

The Validation Team has confirmed the Attendance Sheets (Ref/46/) as well as video recordings (Ref/47/) of the participants and their representations which were found to be an appropriate selection of the stakeholders relative to the project construction and implementation and their locations through these areas.

The Validation Team has checked the details contained in Section E in the PDD version 2 (Ref/1/) and confirmed that the project entity received 11 comments on the project activity. All the comments received were responded adequately by the PP.

During the on-site validation visit, the Validation Team interviewed representatives of these stakeholders and found that they are aware of the project activity, environmental and socio economic impacts due to the project activity.



Bureau Veritas Certification hereby confirms that comments that are relevant for the proposed project activity have been invited from local stakeholders, the summary of the comments received as provided in the PDD is complete, the project participants have taken due account of all comments received and have described this process in the PDD.



4. COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS

The PDD (Ref/1/) using methodology “Consolidated methodology for electricity generation from biomass residues in power-only plants” ACM0018 Version 02.0.0 (Ref/72/) was webhosted on the UNFCCC for global stakeholders comments as per CDM requirements. The project was webhosted from 17/07/2012 to 15/08/2012. No comments were received during this period.



5. VALIDATION OPINION

Bureau Veritas Certification has performed a validation of the San Carlos 18 MW Biopower Power Plant, which is located in Palampas, San Carlos Ecozone, San Carlos City, Negros Occidental, Philippines. The validation was performed on the basis of UNFCCC criteria for the CDM, and host country criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

The validation consisted of the following three phases: i) desk review of the project design document and additional background documents; ii) follow-up interviews with project stakeholders; iii) resolution of outstanding issues and the issuance of the final validation report and opinion.

The project correctly applies the approved consolidated baseline and monitoring methodology ACM 0018, Version 02.0.0 (Ref/72/) and uses the latest guidelines for demonstration of the additionality.

By implementing the proposed biomass power plant, the project is likely to result in reductions of GHG emissions that are real, measurable and give long-term benefits to the mitigation of climate change. It is demonstrated that the project is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity.

Given that the project is implemented and maintained as designed, the project is likely to achieve the estimated annual emission reductions of 64,088 tCO₂e during the seven years of its first renewable crediting period.

The review of the project design documentation and the subsequent follow-up interviews have provided Bureau Veritas Certification with sufficient evidence to determine the fulfillment of stated criteria. In our opinion, the project meets all relevant UNFCCC requirements for the CDM and the relevant host country criteria. Bureau Veritas Certification thus requests registration of the project as a CDM project activity.

Mr. Nyugen Hong Linh
Internal Technical Reviewer
29/12/2012

Mr. Ram Desai
Team Leader
29/12/2012



6. REFERENCES

Category 1 Documents:

Documents provided by project participants that relate directly to the GHG components of the project.

- /1/ Project Design Document (PDD) Version 2 (GSC Version) dated 02/07/2012
- /2/ Project Design Document (PDD), Version 5 (Final) dated 28/12/2012
- /3/ Letter of Approval # LOA-2012-110-ER031 from the Philippines dated 05/06/2012
- /4/ LOA Amendment certification from DNA dated 11/06/2012
- /5/ Modalities of Communication
- /6/ EPC Contract Agreement for SCBP Power Plant dated 10 August 2012 between SCBP and Wuxi Huaguang Electric Power Engineering Co., Ltd (WUXI-HEPECL)
- /7/ Integrated Cane & Residue Collection Feasibility Report, Bronzeoak Group, GENESYS Foundation, Booker Tate, Conducted in cooperation with Renewable Energy & Energy Efficiency Partnership (March 2005)
- /8/ Cane Residue Collection Trials & Transport Study: Final Report, Bronzeoak Phils (RRodriguez), Talisay Bioenergy Inc., EC-ASEAN Fund, Global Opportunities Fund (March 2004)
- /9/ Water Supply Contract Between San Carlos Land, Inc. and San Carlos Biopower Inc.
- /10/ Fuel Supply Study, Biomass Resources Inc (June 2012)
- /11/ Biomass Assessment Study, Biomass Resources Inc (June 2010),
- /12/ Philippine Biofuel Resources, Chris Norris (May 2003)
- /13/ SCBP Organization
- /14/ ECC No. R6-0912-393-4220 issued to San Carlos Biopower Inc. by the Philippine DENR and its amendment dated 28/06/2011
- /15/ Fuel Supply Contract/Agreement
- /16/ San Carlos Biopower Project Process Diagram (Preliminary Design) Drawing No. 01 by Wuxi Huaguang Electric Power Engineering Co., Ltd
- /17/ Article by TC Mendoza, R Samson on the "Relative Bioenergy Potentials of Major Agricultural Crop Residues in the Philippines" Philippine Journal of Crop Science, 31(1): 11-28. April 2006
- /18/ Renewable Energy Act of 2008 (Republic Act 9513)
http://www.congress.gov.ph/download/ra_14/RA09513.pdf
- /19/ Clean Air Act of 1999 (Republic Act 9749)
- /20/ Luzon-Visayas Grid Emission Calculation <GEF Luzon-Visayas Ver 3.xl>
- /21/ Power Sector Situationer 2007 by Philippine Department of Energy
<http://www.doe.gov.ph/EP/Power%20Statistics.pdf>
- /22/ Net Generation (MWh) from 2005-2011 for Luzon and Visayas Grid Connected Power <PHIL Grid NetGen_05_11.CDM.pdf>, DOE, Philippines
- /23/ Table 1.4, page 123 of the Volume 2: Energy, of the 2006 IPCC Guidelines for National Greenhouse Gas Inventory
- /24/ <Recently Built Power Plants for CDM2011.xl> DoE, Philippines
- /25/ Emission Reduction Calculation Model (ERCM) for Biomass residue Power Generation - San Carlos Biopower Plant <San Carlos CER – 7 Dec 2012.xl>
- /26/ Confirmation Letter from Wuxi Huaguang Electric Power Engineering Co., Ltd



 VALIDATION REPORT

- (WUXI-HEPECL) dated 21/09/2012.
- /27/ Project Financial Model <18 MW San Carlos BioPower Project Version 5.xl>
 - /28/ Wuxi Huaguang Electric Power Engineering Co., Ltd confirmatory letter dated 21 September 2012 on federate, NCV, heat rate and net output.
 - /29/ SJR Industrial Construction Miscellaneous Civil and Structural Works proposal dated 11/08/2012
 - /30/ West Machinery Proposal No. M072311-1 for Farm Machinery dated 23/07/2011
 - /31/ Regreen Enterprises Pvt Ltd Proposal on Project Execution Management Services dated 26/08/2012
 - /32/ Rotogrind Quotation for Fuel Processing Equipment dated 20/08/2010
 - /33/ Contract of Lease Between San Julio Realty, Inc and San Carlos Biopower, Inc.
 - /34/ Ordinance No. 198, Series of 1998 – An Ordinance Enacting the San Carlos City, Negros Occidental Incentive Code of 1997 and for Other Purposes
 - /35/ The Local Government Code of the Philippines Book II, Local Taxation and Fiscal Matters – Local Government Taxation
 - /36/ Amendment to Development Loan Agreement by San Carlos Biopower, Inc, dated 31/12/2011
 - /37/ Bangko Sentral ng Pilipinas Report on Economic & Financial Development – First Quarter 2012
http://www.bsp.gov.ph/downloads/Publications/2012/LTP_1qtr2012.pdf
 - /38/ Philippine Energy Regulatory Commission – Resolution No. 10 Series of 2012 – Resolution Approving the Feed-In Tariff Rate http://www.erc.gov.ph/cgi-bin/issuances/files/ResolutionNo.10Seriesof2012_FIT.pdf
 - /39/ Report of Analysis of Lignite from CRL Energy Ltd dated 1/07/2011
 - /40/ Insurance Construction All Risks cover – Summary of Quotes
 - /41/ Philippine Power Development Plan 2009-2030
<http://www.doe.gov.ph/EP/Devp.htm>
 - /42/ Renewable Energy Registration and Accreditation for Biomass Projects in the Philippines – Awarded Biomass Projects as of November 2012.
<http://www.doe.gov.ph/RE%20Regis&accred/Awarded%20Contracts.htm>
 - /43/ CDM Prior Consideration Form submitted to the DNA
 - /44/ Initial Environmental Examination Report
 - /45/ Local Stakeholders' Consultation Invitation Letters
 - /46/ Local Stakeholders' Consultation Attendance Sheets
 - /47/ Video Recordings of the Local Stakeholders' Consultation Meetings
 - /48/ San Carlos Biopower, Inc. Debt Term Sheet from ThomasLloyd Capital LLC
 - /49/ USD to PHP conversion <http://www.investing.com/currencies/usd-php-historical-data>
 - /50/ Private Financing of Renewable Energy – A Guide for Policy Makers (co-produced by UNEP Sustainable Energy Finance Initiative, Bloomberg Energy Finance and Chatham House)



VALIDATION REPORT

- http://sefi.unep.org/fileadmin/media/sefi/docs/publications/Finance_guide_FINAL_.pdf
- /51/ Valuation Box from RCBC
<http://www.rcbcsec.com/secured/admin/download/August%2024%202012%20Valuation.pdf>
- /52/ <http://www.greenprospectsasia.com/content/maybank-meacp-stays-dollars-sense-and-profitability>
- /53/ Letter dated 31 August 2011 to San Carlos Biopower Inc from Thomas-Lloyd Capital LLC
- /54/ ERC Case No. 2011-006 RM http://www.erc.gov.ph/cgi-bin/issuances/files/Decision_ERCCaseNo.2011-006RM_NREB_pp81-90.pdf
- /55/ ERC Case No. 2011-138RC http://www.erc.gov.ph/cgi-bin/issuances/files/Decision_ERCCaseNo.2011-138RC_SOCOTECO_SECpp41-75.pdf
- /56/ San Carlos Biopower, Inc. Debt Term Sheet from ThomasLloyd Capital LLC
- /57/ Contract signing with SEEDLinks Philippines, Inc. as CDM Consultant dated 17/03/2011
- /58/ Feasibility Study on San Carlos Biomass Plant Dedicated Power Production Project, San Carlos, Negros Occidental, Philippines by Bronzeoak dated February 2009
- /59/ Consumer Price Index from National Statistical Coordination Board from January 2004 to October 2012 http://www.nscb.gov.ph/secstat/d_price.asp
- /60/ Werther, J., et al. "Combustion of agricultural residues." *Progress in energy and combustion science* 26.1 (2000): 1-27
- /61/ Green Power Nueva Ecija Philippines Inc. web-site <http://www.green-power-nuevaecija.com>
- /62/ Number of Sugarcane Farms by Farm size for Crop Year 2009-2010 from Philippine Sugar Regulatory Agency
http://www.sra.gov.ph/archive_stat/upd_Farms%20by%20farm%20size.pdf
- /63/ http://www.neda-rcd6.ph/site/rpmc6/on_PowGen_Biomass-ASEA.pdf
- /64/ <http://www.alternat1ve.com/biofuel/2008/12/19/asea-one-power-corp-announces-biomass-energy-plants/>
- /65/ <http://202.57.47.221/internal/Secured/Uploads/ECC/0ddd3bb7-9716-417b-9bf9-73843d10091b.pdf>
- /66/ Jenkins, B. M., L. L. Baxter, and T. R. Miles. "Combustion properties of biomass." *Fuel Processing Technology* 54.1 (1998): 17-46. Available at <http://www.et.byu.edu/~tom/classes/733/ReadingMaterial/Jenkins-Baxter.pdf>

Category 2 Documents:

Background documents related to the design and/or methodologies employed in the design or other reference documents used for cross-check.

- /67/ Clean Development Mechanism Validation and Verification Standard – Version 02.0, EB 65, Annex 4
- /68/ Clean Development Mechanism Project Standard – Version 01.0, EB 65, Annex 5
- /69/ EB Guideline for completing the Project Design Document Form – Version 01.0 , EB 66, Annex 8
- /70/ Information note on the implementation of the E+/E- in the context of projects on



VALIDATION REPORT

- the agenda of the fifty-third meeting of the CDM Executive Board – Version 01.1, EB 53, Annex 32
- /71/ Guidelines for the reporting and validation of Plant Load Factors – Version 01, EB 48, Annex 11
 - /72/ ACM0018 “Consolidated methodology for electricity generation from biomass residues in power-only plants” – Version 02.0.0, EB 66, Annex 40
 - /73/ Tool to calculate the emission factor for an electricity system – Version 3.0.0, EB 70, Annex 22
 - /74/ Project and leakage emissions from road transportation of freight – Version 01.0.0, EB 63, Annex 10
 - /75/ Guidelines on the assessment of investment analysis – Version 05, EB 62, Annex 05
 - /76/ Glossary of CDM terms – Version 05, EB 47
 - /77/ Tool to determine the remaining lifetime of equipment – Version 01, EB 50, Annex 15
 - /78/ Standard for Sampling and Surveys for CDM Project Activates and Programme of Activities Version 03.0, EB69, Annex 4

Persons interviewed:

Persons interviewed during the validation or persons that contributed with other information that are not included in the documents listed above.

San Carlos Biopower Inc.

- /1/ Mr. Juan Xavier P. Zabaleta Director, Philippines Bronzeoak Asia Pacific Clean Energy
President, Biomass Resources Inc.
- /2/ Ms. Ina Kadda Project Manager, San Carlos Biopower Inc.
- /3/ Ms. Ma. Elena V. Menchaca Vice President, San Carlos Biopower
- /4/ Ms. Anna Briggs ThomasLloyd Capital LLC

Seedlinks Philippines, Inc. (Consultant)

- /5/ Mr. Romalino Caraig Consultant, Seedlinks
- /6/ Ms. Mila Jude Consultant, Seedlinks

Local Stakeholder

- /7/ Mr. Gerardo Valmayor City Mayor, San Carlos City, Negros Occidental
- /8/ Mr. Edgardo B. Quisumbing Vice City Mayor, San Carlos City, Negros Occidental
- /9/ Mr. Rommel T. Debulgado City Councilor, San Carlos City, Negros Occidental
- /10/ Mr. Francisco Tolcidas City Administrator, San Carlos City, Negros Occidental
- /11/ Mr. Andre Untal Forester, CENRO, CENRO-Cadiz
- /12/ Mr. Mark E. Cui Barangay Captain, Barangay Palampas, San Carlos City, Negros Occidental
- /13/ Mr. Hipolito Canete Barangay Kagawad, Barangay Palampas, San Carlos City, Negros Occidental
- /14/ Mr. Rogelio B. Delima Barangay Kagawad, Barangay Palampas, San Carlos City, Negros Occidental



VALIDATION REPORT

/15/	Mr. Sofia A. Pacres	Barangay Kagawad, Barangay Palampas, San Carlos City, Negros Occidental
/16/	Mr. Aquilino L. Saavedra, Jr.	Barangay Kagawad, Barangay Palampas, San Carlos City, Negros Occidental
/17/	Mr. Danny M. Suan	Barangay Kagawad, Barangay Palampas, San Carlos City, Negros Occidental
/18/	Mr. Diosdado Verana	Barangay Kagawad, Barangay Palampas, San Carlos City, Negros Occidental
/19/	Mr. Ricardo C. Tilag, Sr.	Barangay Kagawad, Barangay Palampas, San Carlos City, Negros Occidental
/20/	Ms. Gina V. Amparo	Finance and Admin. Manager, Biomass Resources Inc.
/21/	Mr. Mariano Antonio E. Cui III	Chief Operating Officer, GHFMPC
/22/	Mr. Carlos Ted dela Torre	Farm Systems and Operation Manager, Biomass Resources Inc.
/23/	Mr. Alex Galvez	Field Superintendent, GHFMPC
/24/	Mr. Romeo Descartin	Overseer, San Carlos Agro-Aqua Corporation
/25/	Mr. Nelson Lim	Sugar Cane Trash Supplier
/26/	Ms. May Janice Marinas	IEC Specialist, Genesys Foundation Inc.
/27/	Mr. Judito Salvador	Cane Supply Manager, San Carlos Bioenergy Inc.
/28/	Ms. Maria Rosa E. Solis	Executive Director, Genesys Foundation Inc.
/29/	Mr. Roger Tam	Sugar Cane Trash Supplier
/30/	Mr. Roberto G. Bernaje	Engineering Manager, San Carlos Bioenergy Inc.



7. CURRICULA VITAE OF THE DOE'S VALIDATION TEAM MEMBERS

Mr. Ram Desai	Bureau Veritas Certification, Singapore	<p>Team Leader, Climate Change Lead Verifier,</p> <p>Environmental Engineer with over all 13 years of experience in various industries related to Water & Waste water engineering design, installation & Commissioning, Integrated Facility Management for Environmental Services operations in various industries i.e Automotive, Pharmaceutical , IT & Electronics (With Clean Room).</p> <p>Management System Implementation and Maintenance, Green Building concept implementation, Lean Management Implementation, Water & Waste Water engineering Design & project Management, Project Environmental Compliance etc for a construction company.</p> <p>He is the lead auditor for Environment management system, Quality management system and Occupational health and safety management system and his auditing experience spans for 3 year with BVCI & BVCS. He has undergone intensive training on Clean Development Mechanism and was trained as Lead Verifier for CDM in the year 2005 and working as a lead Verifier for validation and verification of CDM/VCS projects</p>
Mr. Adarne Crispo	Bureau Veritas Certification, Philippines	<p>Team Member, Climate Change Verifier.</p> <p>Mr. Crispo is the Deputy Technical Manager at BVC. He is a licensed Metallurgical Engineer with over 12 years extensive experience in metal testing, metallography failure analysis, fabrication and construction of ASME coded boiler and pressure vessel, an steel structural projects. He has worked for 3 years as management system consultant handling quality, environmental and OH&S management system as per ISO 9001, ISO 14001, and OHSAS 18001 for various industries. He is the lead auditor for Environment management system ISO 14001, Quality management system ISO 9001, Occupational health and safety management system OHSAS 18001, automotive quality management system ISO/TS 16949, and TAPA freight security requirements for various industries. His auditing experience spans for 7 years with BVC. He has undergone intensive training on Clean Development Mechanism and GHG accounting and was trained as GHG Verifier for CDM and ISO 14064 projects.</p>



Mr. Jasson - Augillar Russell	Bureau Veritas Certification, Philippines	<p>Financial Specialist</p> <p>Mr. Aguilar is Sales and Marketing Head of BVC. He has a Technological MBA diploma at De La Salle University –Dasmarias and a candidate for Doctor in Business Administration at Pamantasan Lungsod ng Maynila. He has more than 5 year experience in Corporate Planning as Corplan Officer and Corporate Planning Head handling financial forecasting/ budget, bank-wide performance monitoring of financial ratios. He has also more than 5 years in Accounting/Finance Department handling payroll, accounts payable, accounts receivable; 3 years experience as financial consultant handling Financial Statement Preparation (i.e. Income Statement, Balance Sheet) as well as quality management system ISO 9001; and a former university professor teaching accounting on partnership and corporation, and economics.</p> <p>He is the lead auditor at BVC for quality management system ISO 9001:2008, ILO-MLC 2006 and TAPA freight security requirements. His auditing experience spans for almost 4 year with BVC.</p>
Mr. Nguyen Hong Linh	Bureau Veritas Certification, Vietnam	<p>Technical Reviewer, Climate Change Lead Verifier.</p> <p>He has graduated in Environmental Studies and had a Master Degree of Quality Management. He has undergone intensive training on Clean Development Mechanism. His working experience includes more than 5 years of auditing works in the field of Quality Management System and Environmental Management System. He has been involved in the validation and verification work of more than 20 CDM projects.</p>



APPENDIX A: SAN CARLOS 18 MW BIOPOWER POWER PLANT VALIDATION PROTOCOL

Table 1 Validation requirements based on VVS version 02.0 (EB 65 Annex 4), PS version 01.0 (EB 65 Annex 5), PCP version 02.0 (EB 66 Annex 64), and Guidelines for completing the PDD form version 01.0 (EB 66 Annex 8)

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
Part I Cover Page					
(a) Is the title of the project activity provided?	PDD		Yes. San Carlos 18 MW Biopower Power Plant	Ok	Ok
(b) Is the version number of the PDD indicated?	PDD		Yes. Revision 2	Ok	Ok
(c) Is the completion date of the PDD provided in DD/MM/YYYY format?	PDD		02/07/2012	Ok	Ok
(d) Are project participants indicated?	PDD		Yes. San Carlos Biopower Inc.	Ok	Ok
(e) Is the host party(ies) indicated?	PDD		Yes. Philippines	Ok	Ok
(f) Is the sectoral scope and selected methodology(ies) indicated?	PDD		Yes. Sectoral scope 1 – Energy industries (renewable/non-renewable sources) ACM0018, version 02.0.0 – Consolidated methodology for electricity generation from biomass residues in power-only plants	Ok	Ok
(g) Is the estimated amount of annual average GHG emission reductions indicated?	PDD		Yes. 60,104 tons CO ₂ e	Ok	Ok
Part II PDD					
A. Description of project activity					
A.1 Purpose and general description of project activity					



VALIDATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
A.1.1 Is a brief description of the project activity provided, including a summary of the scope of activities/measures that are to be implemented within the project activity?	PDD PS	31(b)	Yes	Ok	Ok
A.1.2 Are the scenario existing prior to the start of project and baseline scenario indicated?	PDD		Yes	Ok	Ok
A.1.3 Does it explain how the project activity will reduce GHG emissions or increase GHG removals?	PS	31(c)	Yes	Ok	Ok
A.1.4 Is the estimated of annual average and total GHG emission reductions for the chosen crediting period provided?	PDD		Yes	Ok	Ok
A.1.5 Is a brief description of how the project activity contributes to sustainable development provided?	PDD		Yes	Ok	Ok
A.1.6 In order to determine whether the description of the proposed project activity in the PDD is accurate, complete, and provides an understanding of the proposed CDM project activity, does the DOE conducted a physical site visit to assess the Project? If not, please justify.	VVS	65	Yes. Physical site visit was conducted on 17/08/2012 by the validation which confirmed the project activity.	Ok	Ok
A.1.7 For all other proposed CDM project activities not referred to in VVS paragraphs 65-66, does the DOE undertaken the validation of project description by reviewing available designs and feasibility studies and should conduct comparison analysis with equivalent projects, as appropriate.	VVS	67	Not applicable	---	---



VALIDATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
A.1.8 If the proposed CDM project activity involves the alteration of an existing installation or process, does the project description state the differences resulting from the project activity compared to the pre-project situation?	VVS	68	Not applicable	---	---
A.2 Location of project activity					
A.2.1 Is the host party(ies) indicated?	PDD		Yes. Philippines	Ok	Ok
A.2.2 Is region/state/province etc. indicated?	PDD		Yes. Negros Occidental	Ok	Ok
A.2.3 Is City/Town/Community etc. indicated?	PDD		Yes. Barangay Palampas, San Carlos Ecozone, San Carlos City	Ok	Ok
A.2.4 Are the details of physical location of the project activity provided?	PDD		Yes. The PDD described the center of the biomass power plant with geographic coordinates at 123°25'16"E and 10°30'36"N; and its location map as described in the Figure 1 of the PDD.	Ok	Ok
A.3 Technologies and measures					
A.3.1 Are there a list and the arrangement of the main manufacturing/ production technologies, systems and equipment involved?	PDD		Yes. The technologies and measures of the project have been described in Section A.3 of the PDD.	Ok	Ok
A.3.1.1 Is the information about the age and average lifetime of the equipment based on manufacturer's specifications and industry standards, and existing and forecast installed capacities, load factors and efficiencies included in the description?	PDD		CAR 11: While validating the emission reduction spread sheet it was observed that ER Calculation sheet "Assumption" provides calculation of BE2 Power Production, however there is no evidence to suggest that PP has utilized Efficiencies of project	CAR 11	Ok



VALIDATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			<p>equipment's i.e. Boiler, Turbine and generator while calculating the Power generation due project activity.</p> <p>CL 1: Please clarify why technical specifications for the project equipment's and Mass balance of energy generation process are not provided in the PDD Section A.3, whereas the EPC contract with Wuxi Huaguang Electricity Power engineering Co. Ltd. is available at the time of validation.</p> <p>CL 2: PP has made several comments in the PDD regarding Biomass Availability, and the survey done. Please provide cross references to these claims in PDD at relevant places in PDD e.g. Availability of biomass in the region.</p>	CL-1	Ok
A.3.1.2 Are the monitoring equipments and their location in the systems included in the description?	PDD		Yes	Ok	Ok
A.3.2 Are energy and mass flows and balances of the systems and equipment included in the project activity provided?	PDD		See CL 1	CL-1	Ok
A.3.3 Are the types and levels of services provided by the systems and equipment that are being modified	PDD		Not applicable	---	---



VALIDATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
and/or installed under the project activity and their relation, if any, to other manufacturing/ production equipment and systems outside the project boundary provided?					
A.3.4 Does the description clearly explain how the same types and levels of services provided by the project activity would have been provided in the baseline scenario?	PDD		Yes. The baseline scenario was described in Section A.3, which is grid connected power plants which would have supplied base load power to the grid in the baseline scenario.	Ok	Ok
A.3.5 Is a list of facilities, systems and equipment in operation under the existing scenario prior to the implementation of the project activity provided?	PDD		Not applicable	---	---
A.3.6 Is a list of facilities, systems and equipment in the baseline scenario provided?	PDD		Not applicable	---	---
A.3.7 Is a description of how technologies and measures and know-how to be used are transferred to the Host Party(ies) included?	PDD		Yes. This is provided in Section A.3 of the PDD.	Ok	Ok
A.4 Party(ies) and project participant(s)					
A.4.1 Are following information provided in a tabular format?					
A.4.1.1 List of project participants and parties	PDD		Yes. San Carlos Biopower Inc.	Ok	Ok
A.4.1.2 Identification of Host Party	PDD		Yes. Philippines	Ok	Ok
A.4.1.3 Indication whether the Party wishes to be	PDD		Yes. The Party wishes not to be considered as project participant.	Ok	Ok

VALIDATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
considered as project participant					
A.5 Public funding of project activity					
A.5.1 Is it indicated whether the project activity receives public funding from Annex I Parties?	PDD		Yes. The project activity does not receive public funding from Annex 1 Parties	Ok	Ok
A.5.2 In case where public funding from Annex I Parties is involved, are followings provided? (a) Information on Parties providing public funding (b) Attached in Appendix 2: the affirmation obtained from such Parties that such funding does not result in a diversion of official development assistance, is separate from, and is not counted towards the financial obligations of those Parties	PS	34	Not applicable	Ok	Ok
B. Application of selected approved baseline and monitoring methodology					
B.1 Reference of methodology					
B.1.1 Is the selected methodology (ies) indicated with exact reference (number, title and version)?	PDD		Yes. ACM0018 "Consolidated methodology for electricity generation from biomass residues in power-only plants" (Version 02.0.0)	Ok	Ok
B.1.2 Are the baseline and monitoring methodologies selected by the project participants the valid versions of those approved by the Board?	VVS	70	Yes.	Ok	Ok
B.1.3 Are there any tools and other methodologies to	PDD		Yes. The PDD Version 2 has provided Tool	Ok	Ok

VALIDATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
which the selected methodology indicated?			to calculate the emission factor for an electricity system, version 02.2.1 CAR 12: Consolidated Methodology for electricity generation from biomass residues in Power – only plants ACM 0018, Version 02.0.0, prescribes tool to calculate Project and leakage emissions from road transportation of freight, however PP has not identified the same in PDD section B.1 instead PP has referred to the Tool for the demonstration and assessment of additionality, Version 06.0.0 in this section which not prescribed by the Approved Methodology.	CAR 12	Ok
B.1.4 Has specific guidance and/or clarifications provided by the Board with respect to the approved methodology and any applicable tools been applied?	VVS	71	See CAR 12	CAR 12	Ok
B.1.5 Is there any deviation or clarification requested for the approved methodology?	VVS	78-81	Not applicable	---	---
B.2 Applicability of methodology					
B.2.1 Is the selected baseline and monitoring methodology applicable to the project activity and that the selected version valid at the time of submission of the proposed project activity for registration?	VVS	73-75	Yes. ACM 0018, version 02.0.0 – “Consolidated methodology for electricity generation from biomass residues in power-only plants” was found valid at the time of submission of the proposed activity for	Ok	Ok



VALIDATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			registration.		
B.2.2 Does the project activity meet each of the applicability conditions of the approved methodology or other methodology component referred to therein?	PDD VVS	76	<p>CAR 1: While validating the applicability of methodology condition to the project activity, it was observed that PP has mentioned that applicability condition No. 2 is applicable and it is ensure that the in co-firing situation fossil fuel percentage will be maintained below 80% on an energy basis, however, from the EPC Contract and Specification documents it was observed that PP will be using bituminous coal as the bed material for fluidized bed boiler as well the coal will be fired as back up fuel to maintain the ash content while operating the boiler. This situation is not transparently documented and no calculation provided to justify how the coal consumption will not exceed the 80% Cap on an energy basis.</p> <p>CL 3: Please provide the list of the Biomass suppliers identified within 40 Km range and their distances from the proposed power Plant.</p> <p>CL 4:</p>	<p>CAR 1</p> <p>CL 3</p> <p>CL 4</p>	<p>Ok</p> <p>Ok</p> <p>Ok</p>

VALIDATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			<p>Please provide clarification in the PDD Section B.4 (i.e. Page 17) as follow:</p> <ol style="list-style-type: none"> 1) The justification provided against P6 and P7 seems contradictory with the justification against P1. PP to clarify how P6 and P7 are not plausible alternative scenario with relevant assumptions and rationales 2) The justification to meet the applicability criterion on biomass residues used by the project facility should not be stored for more than one year. 		
B.3 Project boundary					
B.3.1 Are the emission sources and GHGs included in the project boundary for the purpose of calculating project emissions and baseline emissions described using the table provided?	PDD		<p>Yes. This is provided in Section B.3 of the PDD.</p> <p>CAR 2: PDD Section B.3 is explaining Project Boundary, PP has provided the table to identify the GHG gases included in the project boundary, however in Project Activity it is shown that emissions due to waste water from the treatment of biomass residues is included, which is found irrelevant to the project activity.</p>	<p>Ok</p> <p>CAR-2</p>	<p>Ok</p> <p>Ok</p>
B.3.2 Is a flow diagram of the project boundary	PDD		Yes. This is provided in Section B.3 of the	Ok	Ok

VALIDATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
presented, physically delineating the project activity?			PDD. CAR 3: PDD Section B.3 Page 13, Figure 3 shows the delineation of project boundary, as per the representation it is evidenced that PP has not included the Grid and Power plants connected to the grid in the project boundary.	CAR 3	Ok
B.3.3 Does the flow diagram include the equipment, systems and flows of mass and energy described? In particular, is the emission sources and GHGs included in the project boundary and the data parameters to be monitored indicated in the diagram?	PDD VVS	82	Yes. This is provided in Section B.3 of the PDD.	Ok	Ok
B.4 Establishment and description of baseline scenario					
B.4.1 Is an explanation how the baseline scenario is established in accordance with the selected baseline methodology provided?	PDD VVS	89	Yes. It is provided in Section B.4 of the PDD. CAR 4: While justifying and determining plausible Baseline conditions it is observed that PP has not utilized E+/ E- Policies prevailing in the Host Country in accordance with EB Guideline EB 52 Annex 03.	Ok CAR 4	Ok Ok
B.4.2 When establishing the baseline scenario, and	PS	42	Not applicable	---	---

VALIDATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
where “future anthropogenic emissions by sources are projected to rise above current levels due to the specific circumstances of the host Party”, do the project participants follow the “Guidelines on the consideration of suppressed demand in CDM methodologies”?					
B.4.3 Does the approved methodology that is selected by the proposed CDM project activity prescribe the baseline scenario and hence no further analysis is required?	VVS	113, 115	Not applicable	---	---
B.4.4 If no, does the PDD identify credible alternatives to the project activity in order to determine the most realistic baseline scenario?	VVS	114	See CL 4	CL 4	Ok
B.4.5 Does the list of alternatives given in the PDD ensure that: (a) One of the options that the project activity is undertaken without being registered as a proposed CDM project activity (b) The list contains all plausible alternatives (c) The alternatives comply with all applicable and enforced legislation	VVS	114	See CAR 4 and CL 4 .	CAR 4 CL 4	Ok Ok
B.4.6 Has any procedure contained in the methodology to identify the most reasonable baseline scenario, been correctly applied?	PDD VVS	89	See CAR 4 and CL 4 .	CAR 4 CL 4	Ok Ok
B.4.7 Is the baseline identified for the proposed project activity the scenario that reasonably represents the	VVS	88	Yes	Ok	Ok

VALIDATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
anthropogenic emissions by sources of GHGs that would occur in the absence of the proposed project activity?					
B.4.8 Does the selected methodology require use of tools (such as the “Tool for the demonstration and assessment of additionality” and the “Combined tool to identify the baseline scenario and demonstrate additionality”) to establish the baseline scenario?	VVS	89	Not applicable.	---	---
B.4.9 Does the methodology require several alternative scenarios to be considered in the identification of the most reasonable baseline scenario?	VVS	90	Yes	Ok	Ok
B.4.10 Are the documents and sources referred to in the PDD correctly quoted and interpreted and are they crosschecked with other verifiable and credible sources, such as local expert opinion, if available?	PDD VVS	91	CL 2: PP has made several comments in the PDD regarding Biomass Availability, and the survey done. Please provide cross references to these claims in PDD at relevant places in PDD e.g. Availability of biomass in the region.	CL-2	Ok
B.4.11 Does the PDD provide a description of the identified baseline scenario, including a description of the technology that would be employed and/or the activities that would take place in the absence of the proposed project activity?	VVS	92	Yes	Ok	Ok
B.4.12 Have all applicable CDM requirements been taken into account in the identification of the baseline	VVS	93	See CAR 4.	CAR-4	Ok



VALIDATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
scenario for the proposed project activity?					
B.4.13 Has relevant national and/or sectoral policies and circumstances (type E+ or E-), such as sectoral reform initiatives, local fuel availability, power sector expansion plans, and the economic situation in the project sector been taken into account?	VVS	93	See CAR4.	CAR-4	Ok
B.4.14 Is a transparent description of the baseline scenario provided?	PDD		See CAR 4.	CAR-4	Ok
B.5 Demonstration of additionality					
B.5.1 Is the project activity demonstrated additional in accordance with the selected methodology (ies)?	PDD		<p>CAR 5: PP has identified benchmark of 20%, and provided supporting document i.e. Letter from Thomas Lloyd Capital LLC dated 11th April 2011, which is a financing opinion on required returns on the project, however there is no evidence to suggest that how the value of 20% is arrived and what are the assumptions selected to calculate the benchmark, hence the benchmark selection process is not found in accordance with the EB guideline on Assessment of Financial Analysis (i.e. EB 62 Annex 05).</p> <p>CAR 6: PP has opted the Financial Analysis Approach to demonstrate the additionality for</p>	<p>CAR-5</p> <p>CAR-6</p>	<p>Ok</p> <p>Ok</p>



VALIDATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			<p>the proposed CDM Project, however the presentation of financial analysis in the web hosted PDD is not found in accordance with the applicable EB Guideline EB 62 Annex 05 (e.g. Selection of Bench mark, Selection of financial Indicator and calculation method and Sensitivity Analysis etc.)</p> <p>CAR 7: PP has demonstrated that the Benchmark of 20% will cross only at 2.88% of variation in electricity generation (Kwh) and Electricity Price (Pesos/Kwh) and at -6.25% of variation in the project cost. Please clarify if Project is crossing the benchmark at such low variations which is possible in any condition then how PP considers this project as financially additional?</p> <p>CAR 8: PP has demonstrated the Step 4 of Approved methodology i.e. Common Practice Analysis in PDD on Page 24 – 26, however the demonstration is not in accordance with the Consolidated Methodology for electricity generation from biomass residues in Power – only plants</p>	<p>CAR 7</p> <p>CAR 8</p>	<p>Ok</p> <p>Ok</p>

VALIDATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			ACM 0018, Version 02.0.0 See CAR 4 and CL 4 .	CAR 4 CL 4	Ok Ok
B.5.2 Where the procedure in the selected methodology(ies) and/or tool involves several steps, is it described how each step is applied and is the outcome of each step transparently documented?	PDD		Yes	Ok	Ok
B.5.3 Is the method selected to demonstrate additionality clearly indicated?	PDD		See CAR 4, CAR 5, CAR 6, CAR 7, CAR 8, and CL 4 .	CAR 4 CAR 5 CAR 6 CAR 7 CAR 8 CL 4	Ok Ok Ok Ok Ok Ok
B.5.4 If investment analysis is used:					
B.5.4.1 Are all relevant assumptions and parameters used in the analysis listed?	PDD		See CAR 6 .	CAR 6	Ok
B.5.4.2 Is the latest version of the "Guidelines on the assessment of investment analysis" applied?	VVS	118	See CAR 6 .	CAR 6	Ok
B.5.4.3 Is project activity one of the following cases in regards to investment analysis:	VVS	119			
B.5.4.3.1 The proposed project activity would produce no financial or economic benefits other than CDM-related income;	VVS	119(a)	Yes	Ok	Ok



VALIDATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
B.5.4.3.2 The proposed project activity is less economically or financially attractive than at least one other credible and realistic alternative;	VVS	119(b)	Yes	Ok	Ok
B.5.4.3.3 The financial returns of the proposed project activity would be insufficient to justify the required investment.	VVS	119(c)	Yes	Ok	Ok
B.5.4.4 Has the accuracy of financial calculations carried out for investment analysis been verified as follows:	VVS	120			
B.5.4.4.1 Determine the suitability of the financial indicator selected by the project participants and conduct a thorough assessment of all parameters and assumptions used in calculating such financial indicators, and determine the accuracy and suitability of these parameters using available evidence and applying its expertise in relevant accounting practices	VVS	120(a)	See CAR 6.	CAR 6	Ok
B.5.4.4.2 Cross-check the parameters against third-party or publicly available sources, such as invoices or price indices	VVS	120(b)	See CAR 6.	CAR 6	Ok
B.5.4.4.3 Review, as appropriate, feasibility reports, public announcements and annual financial reports related to the proposed project activity and the project participants	VVS	120(c)	See CAR 6.	CAR 6	Ok

VALIDATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
B.5.4.4.4 Assess the correctness of computations carried out and documented by the project participants; and	VVS	120(d)	See CAR 6.	CAR 6	Ok
B.5.4.4.5 Assess, where applicable, the sensitivity analysis by the project participants to determine under what conditions variations in the result would occur, and the likelihood of these conditions.	VVS	120(e)	See CAR 6.	CAR 6	Ok
B.5.4.5 If benchmark analysis is used:					
B.5.4.5.1 Is the benchmark clearly indicated?	PDD		See CAR 5, CAR 6, and CAR 7.	CAR 5 CAR 6 CAR 7	Ok Ok Ok
B.5.4.5.2 Is the type of benchmark applied suitable for the type of financial indicator presented?	VVS	121(a)	See CAR 5, CAR 6, and CAR 7.	CAR 5 CAR 6 CAR 7	Ok Ok Ok
B.5.4.5.3 Does the risk premiums applied in determining the benchmark reflect the risks associated with the project type or activity?	VVS	121(b)	See CAR 5, CAR 6, and CAR 7.	CAR 5 CAR 6 CAR 7	Ok Ok Ok
B.5.4.5.4 Is it reasonable to assume that no investment would be made at a rate of return lower than the benchmark?	VVS	121(c)	See CAR 5, CAR 6, and CAR 7.	CAR 5 CAR 6 CAR 7	Ok Ok Ok
B.5.4.6 If cost comparison is used:					
B.5.4.6.1 Are the scenarios compared described?	PDD		Not applicable	---	---
B.5.4.7 If PPs rely on values from FSR:	VVS	122			



VALIDATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
B.5.4.7.1 Has the FSR been the basis of the decision to proceed with the investment in the project?	VVS	122(a)	Not applicable	---	---
B.5.4.7.2 Are the values used in the PDD and associated annexes fully consistent with the FSR? If inconsistencies occur, was the appropriateness of the values validated?	VVS	122(b)	Not applicable	---	---
B.5.4.7.3 On the basis of its specific local and sectoral expertise, is confirmation provided, by cross-checking or other appropriate manner, that the input values from the FSR are valid and applicable at the time of the investment decision?	VVS	122(c)	Not applicable	---	---
B.5.5 If barriers analysis is used:					
B.5.5.1 Is the "Guidelines for objective demonstration and assessment of barriers" followed?	PS	48	Yes	Ok	Ok
B.5.5.2 Is it ensured that only the most relevant barriers selected?	PDD		Yes	Ok	Ok
B.5.5.3 Is the credibility of the barriers justified with key facts and/or assumptions and the rationale?	PDD		Yes	Ok	Ok
B.5.5.4 Is it ensured that issues that have a direct impact on the financial returns of the project activity are not considered as barriers but assessed by investment analysis? This does not refer to either: (a) Risk related barriers	VVS	125	Yes	Ok	Ok

VALIDATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
(b) Barriers related to the unavailability of sources of finance for the project activity					
B.5.5.5 Were the barriers determined as real?	VVS	126(a)	Yes.	Ok	Ok
B.5.5.6 Were the barriers determined as preventing the implementation of the project activity but not the implementation of at least one of the possible alternatives?	VVS	126(b)	Yes	Ok	Ok
B.5.6 Common Practice Analysis					
B.5.6.1 If the project type is first-of-its kind, do the project participants consider “Guidelines on additionality of first-of-its-kind project activities”?	VVS PS	128 49(a)	CAR 8: PP has demonstrated the Step 4 of Approved methodology i.e. Common Practice Analysis in PDD on Page 24 – 26, however the demonstration is not in accordance with the Consolidated Methodology for electricity generation from biomass residues in Power – only plants ACM 0018, Version 02.0.0.	CAR-8	Ok
B.5.6.2 If the project type is not first-of-its kind, has common practice analysis been conducted considering “Guidelines on common practice”?	VVS PS	128 49(b)	See CAR 8.	CAR-8	Ok
B.5.6.3 Was it assessed whether the geographical scope of the common practice analysis is appropriate for the assessment related to the project activity’s technology or industry type?	VVS	129(a)	See CAR 8.	CAR-8	Ok
B.5.6.4 Was it determined to what extent similar and operational projects, other than CDM project	VVS	129(b)	See CAR 8.	CAR-8	Ok

VALIDATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
activities, and have been undertaken in the defined region?					
B.5.6.5 Are similar and operational projects, other than CDM project activities, already “widely observed and commonly carried out” in the defined region? Is it assessed whether there are essential distinctions between the proposed CDM project activity and the other similar activities?	VVS	129(c)	See CAR 8.	CAR 8	Ok
B.5.7 Prior consideration of the clean development mechanism					
B.5.7.1 If the project activity start date prior to the date of publication of the PDD for stakeholder comments, were the CDM benefits considered necessary in the decision to undertake the project as a proposed CDM project activity?	PDD VVS	105	Not applicable	---	---
B.5.7.2 Is the start date of the project activity, reported in the PDD, the earliest date at which either the implementation or construction or real action of a project activity begins?	VVS	106	Yes	Ok	Ok
B.5.7.3 If the project activity requires construction, retrofit or other modifications, is it ensured that the date of commissioning not considered as the project activity start date?	VVS	106	Not applicable	---	---
B.5.7.4 Is it a project activity with a start date on or after 02 August 2008, or before 02 August	VVS	106	After 02 August 2008	Ok	Ok



CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
2008?					
B.5.7.5 For a project activity with a start date on or after 02 August 2008, are the following provisions to be satisfied:					
B.5.7.5.1 Has the PP informed the Host Party DNA and the UNFCCC secretariat in writing of the commencement of the project activity and of their intention to seek CDM status within 180days of the project activity start date?	VVS	107	Not applicable	---	---
B.5.7.5.2 Do the project participants inform the secretariat of the progress of the project activity every subsequent two years after the initial notification, until the PDD regarding the project activity has been published for global stakeholder consultation or, a new baseline and monitoring methodology is proposed or a revision of an approved baseline and monitoring methodology is requested for the project activity before the start date?	PCP	9	Not applicable	---	---
B.5.7.6 For a project activity with a start date before 02 August 2008, are the following elements to be satisfied:	VVS	108			
B.5.7.6.1 Are evidence of their awareness of the CDM prior to the project activity start date, and that the benefits of the CDM were a decisive factor in the decision to proceed with the	VVS	108	Not applicable	---	---



VALIDATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
project provided?					
B.5.7.6.2 Are evidence that continuing and real actions were taken to secure CDM status for the project in parallel with its implementation provided?	VVS	108-110	Not applicable	---	---
B.5.7.6.3 Is an implementation timeline of the proposed CDM project activity provided?	PS	28(c)	Not applicable	---	---
B.6 Emission reductions					
B.6.1 Explanation of methodological choices					
B.6.1.1 Does the PDD explain how the methods or methodological steps in the selected methodology, for calculating project emissions, baseline emissions, leakage emissions and emission reductions are applied?	PDD VVS	96	<p>CAR 9: PDD Section B.6 (i.e. Emission Reductions) is not found in accordance with the Consolidated Methodology for electricity generation from biomass residues in Power – only plants ACM 0018, Version 02.0.0. Example - PP has not included step 1.2 to Step 1.8 and Step 2.2 in the PDD and there is no justification why these steps are eliminated while calculating Baseline emissions in accordance with baseline situations B1 – B6.</p> <p>CAR 10: PDD Page 29 – 31, PP has demonstrated the calculation of Project Emission, however while calculating project emission PP has</p>	<p>CAR 9</p> <p>CAR 10</p>	<p>Ok</p> <p>Ok</p>



VALIDATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			<p>omitted Project emission due to fossil fuel consumption, whereas Project activity includes the usage of coal as back-up fuel, diesel as start-up fuel and coal as bed material as well.</p> <p>CAR 11: While validating the emission reduction spread sheet it was observed that ER Calculation sheet "Assumption" provides calculation of BE2 Power Production, however there is no evidence to suggest that PP has utilized Efficiencies of project equipment's i.e. Boiler, Turbine and generator while calculating the Power generation due project activity.</p> <p>CAR 12: Consolidated Methodology for electricity generation from biomass residues in Power – only plants ACM 0018,Version 02.0.0, prescribes tool to calculate Project and leakage emissions from road transportation of freight, however PP has not identified the same in PDD section B.1 instead PP has referred to the Tool for the demonstration and assessment of additionality, Version 06.0.0 in this section which not prescribed by the Approved Methodology.</p>	<p>CAR 11</p> <p>CAR 12</p>	<p>Ok</p> <p>Ok</p>



VALIDATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			<p>CL 5: Quantities for the sugar cane trash presented in Table 6 on PDD page 40 are found inconsistent with those presented in the table BE Source 2 (Uncontrolled burning of sugar trash), Please clarify why this difference is there in the quantities of sugar cane trash.</p> <p>CL 6: While Calculating the emission factor for Luzon – Visayas grid PP has utilized Power generation data for the year 2006 – 2010, However the DNA has already provided the data up to 2011, Please clarify why PP has not used most updated Power generation data to calculate the emission factor for grid.</p>	<p>CL-5</p> <p>CL-6</p>	<p>Ok</p> <p>Ok</p>
B.6.1.2 In case the methodology(ies) include different scenarios or cases, does the PDD indicate and justify which scenario or cases applies to the project activity?	PDD		See CAR. 9	CAR-9	Ok
B.6.1.3 In case the methodology(ies) provide different options to choose from, does the PDD indicate and justify which option is chosen for the project activity?	PDD VVS	97	See CAR 9.	CAR-9	Ok
B.6.1.4 In case the methodology (ies) allow different default values, does the PDD indicate and	PDD		Yes	Ok	Ok

VALIDATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
justify which of the default values have been chosen for the project activity?					
B.6.2 Data and parameters fixed ex ante					
B.6.2.1 If data and parameters will not be monitored throughout the crediting period of the proposed project activity but have already been determined and will remain fixed throughout the crediting period, are all data sources and assumptions: (a) Appropriate and correct? (b) Applicable to the proposed CDM project activity? (c) Resulting in a conservative estimate of the emission reductions?	PDD VVS	98	See CAR 9, CAR 10, CAR 11, CAR 12, CL 6, and CL 7.	CAR 9 CAR 10 CAR 11 CAR 12 CL 6 CL 7	Ok Ok Ok Ok Ok Ok
B.6.2.2 For each piece of data or parameter, are tables provided in accordance with the instructions?	PDD		Yes	Ok	Ok
B.6.3 Ex ante calculations of emission reductions					
B.6.3.1 Is a transparent ex ante calculation of project emissions, baseline emissions (or, where applicable, direct calculation of emission reductions) and leakage emissions expected during the crediting period, applying all relevant equations provided in the approved methodology provided?	PDD		See CAR 9, CAR 10, CAR 11, CAR 12, CL 6, and CL 7.	CAR 9 CAR 10 CAR 11 CAR 12 CL 6 CL 7	Ok Ok Ok Ok Ok Ok
B.6.3.2 Is the information how each equation is	PDD		See CAR 9, CAR 10, CAR 11, CAR 12, CL	CAR 9	Ok

VALIDATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
applied, in a manner that enables the reader to reproduce the calculation, provided?			6, and CL 7.	CAR 10 CAR 11 CAR 12 CL 6 CL 7	Ok Ok Ok Ok Ok
B.6.3.3 Is the information of additional background information and/or data provided in Appendix 4, including relevant electronic spreadsheets?	PDD		See CAR 9, CAR 10, CAR 11, CAR 12, CL 6, and CL 7.	CAR 9 CAR 10 CAR 11 CAR 12 CL 6 CL 7	Ok Ok Ok Ok Ok Ok
B.6.3.4 Is a sample calculation for each equation used provided, substituting the values used in the equations?	PDD		See CAR 9, CAR 10, CAR 11, CAR 12, CL 6, and CL 7.	CAR 9 CAR 10 CAR 11 CAR 12 CL 6 CL 7	Ok Ok Ok Ok Ok Ok
B.6.4 Summary of the ex ante estimates of emission reductions					
B.6.4.1 Are the results of the ex ante estimation of emission reductions for all years of the crediting period, provided in a tabular format?	PDD		Yes	Ok	Ok
B.7 Monitoring Plan					
B.7.1 Data and parameters to be monitored					
B.7.1.1 Is specific information on how the data and parameters that need to be monitored would	PDD		Yes	Ok	Ok



VALIDATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
actually be collected during monitoring included?					
B.7.1.2 For each data or parameter, is the information completed, in a tabular format:					
B.7.1.2.1 The source(s) of data that will be actually used for the proposed project activity (e.g. which exact national statistics). Where several sources may be used, explain and justify which data sources should be preferred.	PDD		Yes	Ok	Ok
B.7.1.2.2 Is an estimate of the data/ parameter that will be monitored during the crediting period provided?	PDD		Yes	Ok	Ok
B.7.1.2.3 Where data or parameters are to be measured, does it specify the measurement methods and procedures, standards to be applied, accuracy of the measurements, person/entity responsible for the measurements, and, in case of periodic measurements, the measurement intervals?	PDD		Yes	Ok	Ok
B.7.1.2.4 Is a description of the QA/QC procedures including the calibration procedures, where applicable, provided?	PDD		Yes	Ok	Ok
B.7.1.2.5 Is the purpose of data indicated?	PDD		Yes	Ok	Ok
B.7.1.3 Is this monitoring plan based on the approved	VVS	131	Yes	Ok	Ok

VALIDATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
monitoring methodology applied to the proposed CDM project activity?					
B.7.1.4 Does the monitoring plan contain all necessary parameters?	VVS	132(a)	Yes	Ok	Ok
B.7.1.5 Do the means of monitoring described in the plan comply with the requirements of the methodology including applicable tool(s)?	VVS	132(a)	Yes	Ok	Ok
B.7.1.6 Are the monitoring arrangements described in the monitoring plan feasible within the project design?	VVS	132(b)	Yes	Ok	Ok
B.7.1.7 Are the means of implementation of the monitoring plan sufficient to ensure that the emission reductions achieved by/resulting from the proposed CDM project activity can be reported ex post and verified?	VVS	132(b)	Yes	Ok	Ok
B.7.2 Sampling plan					
B.7.2.1 Are there any data and parameters monitored in section B.7.1 above to be determined by a sampling approach?	PDD		Yes	Ok	Ok
B.7.2.2 Is a description of the sampling plan provided in accordance with the recommended outline for a sampling plan in the "Standard for sampling and surveys for CDM project activities and programme of activities"?	PDD		Yes	Ok	Ok



VALIDATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
B.7.3 Other elements of monitoring plan					
B.7.3.1 Is the operational and management structure, that the project operator will implement in order to monitor emission reductions and any leakage generated by the project activity, described in the PDD?	PDD PS	56(a)	Yes	Ok	Ok
B.7.3.2 Are the responsibilities for and institutional arrangements for data collection and archiving clearly indicated?	PDD PS	56(c)	Yes	Ok	Ok
B.7.3.3 Does the monitoring plan include provisions to ensure that data monitored and required for verification and issuance be kept and archived electronically for two years after the end of the crediting period or the last issuance of CERs, whichever occurs later?	PS	56(b)	Yes	Ok	Ok
B.7.3.4 Does the monitoring plan include uncertainty levels, methods and the associated accuracy level of measuring instruments to be used for various parameters and variables?	PS	56(e)	Yes	Ok	Ok
B.7.3.5 Does the monitoring plan include specifications of the calibration frequency for the measuring equipments?	PS	56(f)	Yes	Ok	Ok
C. Duration and crediting period					
C.1 Duration of project activity					



VALIDATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
C.1.1 Start date of project activity					
C.1.1.1 Is the start date of the project activity stated, in the format of DD/MM/YYYY?	PDD		Yes	Ok	Ok
C.1.1.2 Does it describe how the start date has been determined and provide evidence to support this date?	PDD		Yes	Ok	Ok
C.1.2 Expected operational lifetime of project activity					
C.1.2.1 Is the expected operational lifetime of the project activity stated in years and months?	PDD		<p>Yes. 20 years, 0 months</p> <p>CL 7: PDD Section C.1.2 PP has mentioned that the expected operational lifetime of the project activity will be 20 years and PP has claimed renewable crediting period of 21 years, please explain the following points:</p> <ol style="list-style-type: none"> 1) How PP has arrived at the project lifetime is not clear as PDD has not refer to the technical lifetime of the project equipment? 2) When PP identified the project lifetime as 20 years, how it is possible to for 21 years crediting period? 3) Financial calculation is done for 25 years, how it is justified? 	Ok CL-7	Ok Ok
C.2 Crediting period of project activity					

VALIDATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
C.2.1 Type of crediting period					
C.2.1.1 Is the type of crediting period chosen for the project activity stated?	PDD		Yes	Ok	Ok
C.2.1.2 In case a renewable crediting period was chosen, does it indicate whether it is the first, second or third?	PDD		Yes. First renewable crediting period	Ok	Ok
C.2.2 Start date of crediting period					
C.2.2.1 Is the start date of crediting period stated in the format of DD/MM/YYYY?	PDD		Yes. 01/01/2015	Ok	Ok
C.2.3 Length of crediting period					
C.2.3.1 Is the length of crediting period stated in years and months?	PDD		Yes	Ok	Ok
D. Environmental impacts					
D.1 Analysis of the environmental impacts					
D.1.1 Is a summary of the analysis of the environmental impacts of the project activity and references to all related documentation provided?	PDD		Yes	Ok	Ok
D.2 Environmental impact assessment					
D.2.1 If an environmental impact assessment is required, are conclusions and references to all related documentation provided?	PDD		Yes	Ok	Ok
D.2.2 Have the project participants undertaken an	VVS	134	Yes	Ok	Ok



VALIDATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
analysis of environmental impacts activity, including transboundary impacts, and whether those impacts are considered significant by the project participants or the host Party?					
D.2.3 If the host Party requires an environmental impact assessment, have the environmental impact assessment approved by local government?	VVS	135	Yes	Ok	Ok
E. Local stakeholder consultation					
E.1 Solicitation of comments from local stakeholders					
E.1.1 Did the project participants complete a local stakeholder consultation process and that due steps were taken to engage stakeholders and solicit comments for the proposed project activity?	VVS	138	Yes	Ok	Ok
E.1.2 Is the process by which comments from local stakeholders have been invited provided?	PDD		Yes	Ok	Ok
E.2 Summary of comments received					
E.2.1 Are stakeholders that have made comments identified?	PDD		Yes	Ok	Ok
E.2.2 Have comments by local stakeholders that can reasonably be considered relevant for the proposed CDM project activity been invited?	VVS	139 (a)	Yes	Ok	Ok
E.2.3 Is the summary of comments provided complete?	PDD VVS	139 (b)	Yes	Ok	Ok



VALIDATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS		Draft Concl	Final Concl
E.3 Report on consideration of comments received						
E.3.1 Is information provided to demonstrate that all comments received have been considered?	PDD VVS	139 (c)	Yes		Ok	Ok
F. Approval and authorization						
F.1 General						
F.1.1 Is it indicated whether the letter(s) of approval from Party(ies) available at the time of submitting the PDD to the validating DOE?	PDD		Yes		Ok	Ok
F.2 Approval			COUNTRY A	COUNTRY B		
F.2.1 Has the DNA of each Party indicated as being involved in the proposed CDM project activity in section A.3 of the PDD provided a written letter of approval?	VVS	38	Philippines	Not applicable	Ok	Ok
F.2.2 Does the letter of approval from DNA of each Party confirm that : (a) The Party is a Party of the Kyoto Protocol (b) The participation is voluntary (c) In the case of the host Party, the proposed CDM project activity contributes to the sustainable development of the country (d) Refers to the precise proposed CDM project activity title in the PDD being submitted for registration	VVS	39	Yes	Not applicable	Ok	Ok
F.2.3 Is(are) the letter(s) of approval unconditional with	VVS	40	Yes	Not applicable	Ok	Ok



VALIDATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS		Draft Concl	Final Concl
respect to (F.2.2) above?						
F.2.4 Has(ve) the letter(s) of approval been issued by the respective Party's DNA? If there is doubt with respect to (F.2.2) above, was it verified with the DNA that the letter of approval is valid for the proposed CDM project activity under validation?	VVS	41,42	Yes	Not applicable	Ok	Ok
F.2.5 Does the letter of approval by the DNA of the host Party confirm the contribution of the proposed CDM project activity to the sustainable development of the host Party?	VVS	51	Yes		Ok	Ok
F.3 Authorization						
F.3.1 Has each project participant been authorized by at least one Party involved in a letter of approval?	VVS	45	Yes		Ok	Ok
F.3.2 Is the information in tabular form in the PDD consistent with the contact information for project participants provided?	VVS	46	Yes		Ok	Ok
F.3.3 Are any entities other than those approved as project participants included in the PDD?	VVS	47	Not applicable		---	---
F.3.4 Has the approval of participation issued from the relevant DNA? And if in doubt, was it verified with the DNA that the approval of participation is valid for the proposed CDM project participants?	VVS	48	Yes		Ok	Ok
Part III Others						
A. Appendixes of PDD						



CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
A.1 Appendix 1: Contact information of project participants					
A.1.1 For each organization listed in section A.4 of PDD, is the table in PDD completed, with the following mandatory fields: Organization, City, postcode, Country, Telephone and Fax, e-mail and Name of contact person?	PDD		Yes	Ok	Ok
A.2 Appendix 2: Affirmation regarding public funding					
A.2.1 If applicable, is the affirmation obtained from Parties providing public funding to the project Activity attached?	PDD		Not applicable	---	---
A.3 Appendix 3: Applicability of the selected methodology(ies)					
A.3.1 Is the background information on the applicability of the selected methodology provided?	PDD		Not applicable	---	---
A.4 Appendix 4: Further background information on ex ante calculation of emission reductions					
A.4.1 Is the background information on the ex ante calculation of emission reductions provided?	PDD		Yes. Details on the calculations of the grid emission factors.	Ok	Ok
			See CL 6	CL-6	Ok
A.5 Appendix 5: Further background information on monitoring plan					



CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
A.5.1 Is the background information used in the development of the monitoring plan provided?	PDD		Not applicable	---	---
A.6 Appendix 6: Summary of post registration changes					
A.6.1 Is a summary of the post registration changes provided?	PDD		Not applicable	---	---
B. Global Stakeholder Consultation					
B.1.1 Is there any comment on the PDD of the proposed project activity received during Global Stakeholder Consultation process?	VVS	34	There was comment received on the PDD of the proposed project activity received during Global Stakeholder Consultation process.	Ok	Ok
B.1.2 If yes, have all comments been taken into account during the validation of the proposed project activity?	VVS	35	Not applicable	---	---
B.1.3 If comments indicate that the proposed project activity does not comply with the CDM requirements and are not substantiated, is there any further clarification from the entity providing the comment?	VVS	36	Not applicable	---	---
B.1.4 If yes, how comments received have been taken due account?	VVS	36	Not applicable	---	---
B.1.5 If no, are the comments as originally provided proceeded to assess?	VVS	36	Not applicable	---	---
C. Modalities of Communications (MoC)					



VALIDATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
C.1.1 Has the corporate identity of all project participants and focal points included in MoC statement, as well as the personal identities, including specimen signatures and employment status, of their authorized signatories been validated by:	VVS	53			
C.1.1.1 Directly checking evidence for corporate, personal identity and other relevant documentation; or	VVS	54(a)	Yes	Ok	Ok
C.1.1.2 Notarized documentation; or	VVS	54(b)	Not applicable	---	---
C.1.1.3 Written confirmation from the project participant or the coordinating/managing entity that all corporate and personal details, including specimen signatures, are valid and accurate.	VVS	54(c)	Yes	Ok	Ok
C.1.2 If (C.1.1.3) above was chosen, is it ensured that the MoC statement is received from a project participant with whom the DOE has a contractual relationship?	VVS	55	Yes	Ok	Ok
C.1.3 If (C.1.1.3) above was chosen, is it ensured that the official who submits the MoC statement to the DOE and the official who signed the written confirmation (if a different person) is/are duly authorized to do so on behalf of the respective project participant?	VVS	56	Yes	Ok	Ok
C.1.4 If it is unable to validate the requirements by applying C.1.1.1 to C.1.1.3 above, are any further	VVS	57	Not applicable	Ok	Ok



VALIDATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
validation activities performed?					
C.1.5 Has the latest version of the form “Modalities of Communication statement” (F-CDM-MOC) been used?	VVS	60(a)	Yes	Ok	Ok
C.1.6 Is the information required as per F-CDM-MOC, including its annex 1, correctly completed?	VVS	60(b)	Yes	Ok	Ok
C.1.7 Do the project participant’s authorized signatories signing the F-CDM-MOC correspond to the project participant’s authorized signatories included in F-CDM-MOC, annex 1?	VVS	60(c)	Yes	Ok	Ok

Table 2 Resolution of Corrective Action and Clarification Requests

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
CAR 1: While validating the applicability of methodological Condition to the project activity it was observed that PP has mentioned that Applicability condition No. 2 is applicable and it is ensure that the in co-firing situation fossil fuel percentage will be maintained below 80% on an	Table 1 Part II B.2.2	Recent communication with the supplier, the bed material that will be used will be crushed stone rather than coal. According to the amended Environmental Compliance Certificate (ECC) issued to San Carlos Biopower Inc. by the Department of Environment and Natural	The validation team verified the calculations provided by PP and the supporting document i.e. Environmental Compliance Certificate, where it is clearly mentioned that Lignite usage is to be restricted to 25%. PDD section

VALIDATION REPORT

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion																																				
energy basis, however from the EPC Contract and Specification documents it was observed that PP will be using Bituminous coal as the bed material for fluidized bed boiler as well the coal will be fired as back up fuel to maintain the ash content while operating the boiler. This situation is not transparently documented and no calculation provided to justify how the coal consumption will not exceed the 80% Cap on an energy basis.		<p>Resources (DENR), the project is allowed to utilize lignite up to 25% of the fuel mix. This translates to approximately 25% fossil fuel consumption on an energy basis, using the net calorific values (NCV) of lignite 9.99 GJ/ton. If lignite will constitute 25% of the fuel mix by mass, this translates to 25.50% of the total heat requirement. Therefore, the possible co-firing of lignite will not exceed the 80% of the total fuel fired on an energy basis.</p> <table><tr><th>CASE 1: Energy basis</th><th>Lignite</th><th>Biomass</th></tr><tr><td>Total heat requirement (GJ/yr)</td><td>1,561,032</td><td></td></tr><tr><td>Proportion, energy basis (%)</td><td>25%</td><td>75%</td></tr><tr><td>Heat produced (GJ)</td><td>390,258</td><td>1,170,774</td></tr><tr><td>NCV (GJ/ton)</td><td>9.99</td><td>9.73</td></tr><tr><td>Tonnage (tons)</td><td>39,065</td><td>120,326</td></tr><tr><td>Corresponding mass percentage (%)</td><td>24.51%</td><td>75.49%</td></tr></table> <table><tr><th>CASE 2: Mass basis</th><th>Lignite</th><th>Biomass</th></tr><tr><td>Mass percentage (%)</td><td>25%</td><td>75%</td></tr><tr><td>Tonnage (tons)</td><td>26,739</td><td>80,217</td></tr><tr><td>Heat produced (GJ)</td><td>267,123</td><td>780,511</td></tr><tr><td>Corresponding heat percentage (%)</td><td>25.50%</td><td>74.50%</td></tr></table>	CASE 1: Energy basis	Lignite	Biomass	Total heat requirement (GJ/yr)	1,561,032		Proportion, energy basis (%)	25%	75%	Heat produced (GJ)	390,258	1,170,774	NCV (GJ/ton)	9.99	9.73	Tonnage (tons)	39,065	120,326	Corresponding mass percentage (%)	24.51%	75.49%	CASE 2: Mass basis	Lignite	Biomass	Mass percentage (%)	25%	75%	Tonnage (tons)	26,739	80,217	Heat produced (GJ)	267,123	780,511	Corresponding heat percentage (%)	25.50%	74.50%	B.2 was revised by the PP accordingly and hence, the validation team considers the CAR1 as closed.
CASE 1: Energy basis	Lignite	Biomass																																					
Total heat requirement (GJ/yr)	1,561,032																																						
Proportion, energy basis (%)	25%	75%																																					
Heat produced (GJ)	390,258	1,170,774																																					
NCV (GJ/ton)	9.99	9.73																																					
Tonnage (tons)	39,065	120,326																																					
Corresponding mass percentage (%)	24.51%	75.49%																																					
CASE 2: Mass basis	Lignite	Biomass																																					
Mass percentage (%)	25%	75%																																					
Tonnage (tons)	26,739	80,217																																					
Heat produced (GJ)	267,123	780,511																																					
Corresponding heat percentage (%)	25.50%	74.50%																																					



VALIDATION REPORT

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
		Lignite will only be used as a start-up fuel and, if needed, as back-up fuel as well.	
CAR 2: PDD Section B.3 is explaining Project Boundary, PP has provided the table to identify the GHG gases included in the project boundary, however in Project Activity it is shown that emissions due to waste water from the treatment of biomass residues is included, which is found irrelevant to the project activity.	Table 1, Part II B.3.1	Emissions from wastewater treatment are now excluded, see Section B.3.	Ok. Accepted and CAR 2 is closed.
CAR3: PDD Section B.3 Page 13, Figure 3 shows the delineation of project boundary, as per the representation it is evidenced that PP has not included the Grid and Power plants connected to the grid in the project boundary.	Table 1, Part II B.3.2	Grid-connected power plants are now included in the project boundary, see Section B.3, Figure 3.	OK. Accepted and CAR 3 is closed.
CAR4: While justifying and determining plausible Baseline conditions it is observed that PP has not utilized E+/ E- Policies prevailing in the Host Country in accordance with EB Guideline EB 52 Annex 03.	Table 1, Part II B.4.1 B.4.5 B.4.6	E+/E- policies are now considered under Section B.4. Relevant provisions of Clean Air Act pertaining to the promotion of clean energy have been incorporated.	Ok Accepted and Closed Car 4

VALIDATION REPORT

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
	B.4.12 B.4.13 B.4.14 B.5.1 B.5.3		
CAR 5: PP has identified benchmark of 20%, and provided supporting document i.e. Letter from Thomas Lloyd Capital LLC dated 11 th April 2011, which is a financing opinion on required returns on the project, however there is no evidence to suggest that how the value of 20% is arrived and what are the assumptions selected to calculate the benchmark, hence the benchmark selection process is not found in accordance with the EB guideline on Assessment of Financial Analysis (i.e. EB 62 Annex 05).	Table 1, Part II B.5.1 B.5.3 B.5.4.5.2 B.5.4.5.3 B.5.4.5.4	<p>The justification of the 20% IRR benchmark is added in Section B.4, Step 3.</p> <p>Justification of the 20% IRR Benchmark</p> <p>Equity Internal Rate of Return (E-IRR) is selected as the most suitable financial indicator, since the investment decision of the project owner and investors are based on the expected E-IRR of the project activity.</p> <p>The E-IRR of the Project must be above a minimum level, or benchmark level, required by the project owner and other investors. Given that the Project could be developed by other entities apart from the</p>	<p>The E-IRR Calculation approach is found in accordance with EB62 Annex 5, hence CAR 5 is closed.</p>

VALIDATION REPORT

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
		<p>project owner, a publicly available benchmark E-IRR that would apply to investors generally is determined and applied here.</p> <p>In accordance with the Guidelines on the Assessment of Investment Analysis, Version 05, EB62, paragraph 15: “If the benchmark is based on parameters that are standard in the market, the cost of equity should be determined either by: (a) selecting the values provided in Appendix A; or by (b) calculating the cost of equity using best financial practices, based on data sources which can be clearly validated by the DOE, while properly justifying all underlying factors.”</p> <p>Option (b) is chosen. A new benchmark has been developed through the following means:</p> <ol style="list-style-type: none"> 1.Third party, reputable and independent publications that report required returns on equity for investments in emerging markets. 2. Required return on equity of 	



VALIDATION REPORT

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
		<p>investments in emerging markets as reported by pertinent investment banks and funds.</p> <p>3. Calculating the cost of equity based on the principles of the Capital Asset Pricing Model (CAPM) using Philippines bond and stock market data. All the data is available publicly and has been assessed and utilised by the Energy Regulatory Commission of the Philippines.</p> <p>Based on the above strategies, we determine that the appropriate post-tax Equity IRR benchmark for the project is [20%] real.</p> <p><i>Third Party Research Reports</i></p> <ul style="list-style-type: none"> - United Nations Environmental Programme: Private Financing of Renewable Energy – A Guide for Policy Makers (co-produced by UNEP Sustainable Energy Finance Initiative, Bloomberg Energy Finance and Chatham House) states that private equity 	



VALIDATION REPORT

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
		<p>funds typically require an IRR of > 25%.</p> <ul style="list-style-type: none"> - An analysis of top mutual fund performance in the Philippines in the last 3 years, as at 31 March 2012, shows realised net equity returns to the respective funds of in excess of 30% pa.* This is indicative of the returns available to equity investors in the Philippines and represents the opportunity cost of equity capital. - A valuation of power companies in the Philippines by RCBC Securities, Inc shows an expectation that returns on equity in the sector will average 19.6%-21.9% in the period 2011-2013. 	

* <http://mutualfundphilippines.com/2012/03/fund-performance/top-mutual-funds-in-the-philippines-as-of-march-31-2012/>



VALIDATION REPORT

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
		<ul style="list-style-type: none"> - A report by BPI asset management, the biggest unit trust company in the Philippines, anticipates continued GDP growth in the Philippines and corporate earnings expansion in the range of 10-15% pa. <p><i>Investment Funds and Investment Banks</i></p> <ul style="list-style-type: none"> - Maybank MEACP is a recently launched clean energy master fund managed out of Singapore and targeting renewable energy investments in the Philippines as well as elsewhere in Asia. The fund has stated that equity returns need to be in the high teens for investments into businesses with existing operating assets, where risk diversification exists. Accordingly required returns into single project companies need to be higher to reflect the 	



VALIDATION REPORT

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
		<p>commensurately higher risk.</p> <ul style="list-style-type: none"> - Thomas Lloyd Capital LLC, advisor to San Carlos BioPower, provided a written statement that investors would seek returns in excess of 20% for single project investments such as the San Carlos BioPower project. This has been borne out in discussions with potential investors in the project who seek sufficient return to compensate for the risks of investing in a single-asset company. <p><i>Theoretical Required Rate of Return on Equity Using Capitalized Asset Pricing Model</i></p> <p>The theoretical cost of equity using the CAPM model was determined by the Philippine Energy Regulatory Commission in July 2012 based on the</p>	

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
		<p>following equation:</p> $r_e = r_f + \text{Beta}_e \times \text{MRP}$ <p>Where:</p> <p>r_e = nominal cost of equity</p> <p>r_f = risk free rate estimated for the Philippines, which was assumed to be 6% based on 10 year yields on Philippine bonds</p> <p>Beta_e = equity beta for benchmark generation company, calculated as 1.03 on an unlevered basis from the betas of comparable companies provided by Professor Aswath Damodaran of New York University, Stern</p> <p>MRP = Market Risk Premium, calculated based on a measure of Country Risk Premium provided by Professor Aswath Damodaran of New York</p>	



VALIDATION REPORT

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
		<p>University, Stern from data published in January 2012. Professor Stern estimates the Philippines to have a CRP of 4.13% and a Total Risk Premium of 10.13% based on a default spread of 275 basis points and a country rating by Moodys of Ba2. This gives a total Market Risk Premium of 10.13%.</p> <p>This calculation provides a computed cost of equity as 16.44% for the Philippines. This was confirmed by ERC in its recent decision on the establishment of Feed in Tariff levels for the Philippines. However, the ERC acknowledged that the calculation didn't properly reflect the risks associated with biomass renewable energy projects and decided to adopt a cost of equity risk premium for biomass projects of 0.56% giving an all-in cost of equity for biomass investments of 17%..</p>	



VALIDATION REPORT

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
		<p>Notwithstanding the above, there is disagreement about the actual cost of equity capital in the Philippines energy market with the National Renewable Energy Board advocating 18.5% for biomass investments and other active investors in the market calculating CAPM-based rates of 19.28% in their submissions to the ERC.</p> <p>Project Risk The benchmarks calculated above are based on market data. The Philippine stock market consists of Publicly Listed companies which are relatively large and diversified operationally and financially. As such the average realised cost of equity for these listed companies is likely to be less for such companies than for individual projects, particularly green field projects. Thus a premium for greenfield project risk should be incorporated into the final benchmark. Based on discussions with potential third party equity investors into the San Carlo BioPower project, a premium of 3% on</p>	



Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
		<p>top of the ERC published cost of equity is required.</p> <p>Final Benchmark Whilst a computed cost of equity based on CAPM methodologies generates a range of cost of equity rates for biomass investments from 17% to 19.28%, it is also evident that competing equity investment opportunities in diversified Philippine power companies support the assertion that a 20% return on equity is required to attract investment into a single project power company. Accordingly, the appropriate equity benchmark is 20% real.</p>	
<p>CAR 6: PP has opted the Financial Analysis Approach to demonstrate the additionality for the proposed CDM Project, however the presentation of financial analysis in the web hosted PDD is not found in accordance with the applicable EB Guideline EB 62 Annex 05 (e.g. Selection of Bench mark, Selection of financial Indicator and</p>	<p>Table 1, Part II B.5.1 B.5.3 B.5.4.1 B.5.4.2</p>	<p>Section B.4 of the PDD is edited accordingly, as provided in the EB Guideline EB 62 Annex 05 (e.g. Selection of Bench mark, Selection of financial Indicator and calculation method and Sensitivity Analysis etc.)</p>	<p>Revised PDD version 3 is now demonstrates Financial analysis in accordance with EB 62 Annex 5, hence CAR 6 is closed.</p>

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
calculation method and Sensitivity Analysis etc.)	B.5.4.4.1 B.5.4.5.2 B.5.4.5.3 B.5.4.5.4		
CAR 7: PP has demonstrated that the Benchmark of 20% will cross only at 2.88% of variation in electricity generation (Kwh) and Electricity Price (Pesos/Kwh) and at -6.25% of variation in the project cost. Please clarify if Project is crossing the benchmark at such low variations which is possible in any condition then how PP considers this project as financially additional?	Table 1, Part II B.5.1 B.5.3 B.5.4.5.2 B.5.4.5.3 B.5.4.5.4	The financial analysis have been revised using the latest parameters.	The Sensitivity Analysis is found in accordance with EB62 Annex 5, hence CAR 7 is closed.
CAR 8: PP has demonstrated the Step 4 of Approved methodology i.e. Common Practice Analysis in PDD on Page 24 – 26, however the demonstration is not in accordance with the Consolidated Methodology for electricity generation from biomass residues in Power – only plants ACM 0018, Version 02.0.0.	Table 1, Part II B.5.1 B.5.3 B.5.6.1 B.5.6.2 B.5.6.3 B.5.6.4 B.5.6.5	The assessment of common practice now conforms to the “Common Practice Analysis” provided for by ACM0018. Any reference to the common practice analysis provided by the “Tool for the demonstration and assessment of additionality” has been removed.	Ok. Accepted

VALIDATION REPORT

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
CAR 9: PDD Section B.6 (i.e. Emission Reductions) is not found in accordance with the Consolidated Methodology for electricity generation from biomass residues in Power – only plants ACM 0018, Version 02.0.0. Example - PP has not included step 1.2 to Step 1.8 and Step 2.2 in the PDD and there is no justification why these steps are eliminated while calculating Baseline emissions in accordance with baseline situations B1 – B6.	Table 1, Part II B.6.1.1 B.6.1.2 B.6.1.3 B.6.1.4 B.6.2.1 B.6.3.1 B.6.3.2 B.6.3.3 B.6.3.4	The steps that were not included are either not applicable or produce zero as a result. These steps are now included in the PDD.	Ok Accepted and hence closed CAR 09.
CAR 10: PDD Page 29 – 31, PP has demonstrated the calculation of Project Emission, however while calculating project emission PP has omitted Project emission due to fossil fuel consumption, whereas Project activity includes the usage of coal as back-up fuel, diesel as start-up fuel and coal as bed material as well.	Table 1, Part II B.6.1.1 B.6.2.1 B.6.3.1 B.6.3.2 B.6.3.3 B.6.3.4	As explained in the response to CAR 1, lignite will only be used as a start-up fuel and, if needed, as back-up fuel as well, to the maximum allowable extent of 25% of the fuel mix. Owing to the contingent use of lignite, emissions from fossil fuel consumption will be accounted for ex post. A parameter is now added to section B.7.1 “Data and parameters to be monitored”, the parameter “Amount of fuel (lignite) used in the heat generation equipment, if any” in tons.	Ok Accepted and hence closed. CAR 10.

VALIDATION REPORT

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
CAR 11: While validating the emission reduction spread sheet it was observed that ER Calculation sheet "Assumption" provides calculation of BE2 Power Production, however there is no evidence to suggest that PP has utilized Efficiencies of project equipment's i.e. Boiler, Turbine and generator while calculating the Power generation due project activity.	Table 1, Part II A.3.1.1 B.6.1.1 B.6.2.1 B.6.3.1 B.6.3.2 B.6.3.3 B.6.3.4	Efficiencies are now considered in the calculation. Please refer to PDD section A.3 for the detailed calculation.	Ok Accepted and hence CAR 11 is closed.
CAR 12: Consolidated Methodology for electricity generation from biomass residues in Power – only plants ACM 0018, Version 02.0.0, prescribes tool to calculate Project and leakage emissions from road transportation of freight, however PP has not identified the same in PDD section B.1 instead PP has referred to the Tool for the demonstration and assessment of additionality, Version 06.0.0 in this section which not prescribed by the Approved Methodology.	Table 1, Part II B.6.1.1 B.6.1.2 B.6.1.2 B.6.1.3 B.6.1.4 B.6.2.1 B.6.3.1 B.6.3.2 B.6.3.3	Reference to the tool "Project and leakage emissions from road transportation of freight" is now included under section B.1. On the other hand, reference to the "Tool for the demonstration and assessment of additionality" has been removed.	Ok Accepted and hence CAR 12 is closed.

VALIDATION REPORT

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
	B.6.3.4		
CL 1: Please clarify why technical specifications for the project equipment's and Mass balance of energy generation process are not provided in the PDD Section A.3, whereas the EPC contract with Wuxi Huaguang Electricity Power engineering Co. Ltd. is available at the time of validation.	Table 1, Part II A.3.1.1 A.3.2	The process flow diagram has been updated to reflect mass and energy balances. Technical specifications of the boiler, steam turbine, and generator have been included as well.	Ok Accepted and hence CL 1 is closed.
CL 2: PP has made several comments in the PDD regarding Biomass Availability, and the survey done. Please provide cross references to these claims in PDD at relevant places in PDD e.g. Availability of biomass in the region.	Table 1, Part II B.4.10	References to the aforesaid studies are now cited in the PDD, Section A.3.	OK Accepted and hence CL2 is closed.
CL 3: Please provide the list of the Biomass suppliers identified within 40 Km range and their distances from the proposed power Plant.	Table 1, Part II B.2.2	A list of the Biomass suppliers identified within 40-km range and their distances from the proposed power plant are now provided for under Section B.2	OK Accepted and hence CL 3 is closed.
CL 4: Please provide clarification in the PDD Section B.4 (i.e. Page 17) as follow: 1) The justification provided against P6 and P7 seems contradictory with the justification against P1. PP to clarify how P6 and P7 are not plausible alternative	Table 1, Part II B.2.2 B.4.4 B.4.5 B.4.6	1) ACM0018 (version 02.0.0, page 9) provides that: <i>"If the project activity is the establishment of a greenfield power plant and supplies electricity only to the grid, then the alternatives considered for power generation should include only the scenarios P1 and P5."</i>	OK Accepted and hence CL4 is closed.

VALIDATION REPORT

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
<p>scenario with relevant assumptions and rationales</p> <p>2) The justification to meet the applicability criterion on biomass residues used by the project facility should not be stored for more than one year.</p>	<p>B.5.1</p> <p>B.5.3</p>	<p>Hence, since the project involves the establishment of a greenfield power plant and supplies electricity only to the grid, only P1 and P5 scenarios apply. Previous justification against the applicability of P6 and P7 has now been replaced by the above cited provision.</p> <p>2) Storage will be implemented on a “first in, first out” basis, where the older bales will be taken out first under strict schedule to ensure that no biomass residues will be stored for more than one year.</p>	
<p>CL 5:</p> <p>Quantities for the sugar cane trash presented in Table 6 on PDD page 40 are found inconsistent with those presented in the table BE Source 2 (Uncontrolled burning of sugar trash), Please clarify why this difference is there in the quantities of sugar cane trash.</p>	<p>Table 1, Part II</p> <p>B.6.1.1</p> <p>B.6.2.1</p> <p>B.6.3.1</p> <p>B.6.3.2</p> <p>B.6.3.3</p> <p>B.6.3.4</p>	<p>The quantities provided for in Table 6 refer to the delivered quantities, whereas those in Table 1 refer to boiler-intake quantities. The difference can be attributed to the physical processing of biomass residues prior to combustion. Hence, no further changes have been made.</p>	<p>OK Accepted and hence CL 5 is closed</p>
<p>CL 6:</p>	<p>Table 1,</p>	<p>A new grid emission factor has been</p>	<p>OK Accepted and hence CL 6 is</p>



VALIDATION REPORT

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
While Calculating the emission factor for Luzon – Visayas grid PP has utilized Power generation data for the year 2006 – 2010, However the DNA has already provided the data up to 2011, Please clarify why PP has not used most updated Power generation data to calculate the emission factor for grid.	Part II B.6.1.1 B.6.2.1 B.6.3.1 B.6.3.3 B.6.3.4 Table 1, Part III A.4.1	calculated using the data from 2007-2011. Please see Appendix 4 of the PDD. The CER calculation and financial analysis have been revised accordingly to account for the new grid emission factor.	closed.
CL 7: PDD Section C.1.2 PP has mentioned that the expected operational lifetime of the project activity will be 20 years and PP has claimed renewable crediting period of 21 years, please explain the following points: 1) How PP has arrived at the project lifetime is not clear as PDD has not refer to the technical lifetime of the project equipment? 2) When PP identified the project lifetime as 20 years, how it is possible to for 21 years crediting period? 3) Financial calculation is done for 25 years, how it is justified?	Table 1, Part II C.1.2.1	The default equipment lifetime as provided for by the “Tool to determine the remaining lifetime of equipment” (EB 50, Annex 15) are considered. The financial model and the CER calculations now reflect 20 years.	Ok. Accepted.



VALIDATION REPORT

Contract No.	PHILS/0013/2012
Project title	San Carlos 18 MW Biopower Power Plant
GSC-PDD version	2
GSC-PDD date	02/07/2012
GSC Period	17/07/2012 to 15/08/2012
Final PDD version	4
Final PDD date	10/12/2012
Methodology A and version	ACM0018, version 02.0.0
Methodology B and version	Not applicable
Crediting period	01/01/2015 to 31/12/2021
Site visit date	17/08/2012
FVR Sign-off date	12/12/2012
ER	64,088 tCO ₂ e
Project owner	San Carlos Biopower Inc.
Project buyer	Not applicable
Consultant	Seedlinks Philippines, Inc.
Client	San Carlos Biopower Inc.
Project location	Barangay Palampas, San Carlos Ecozone, San Carlos City, Negros Occidental, Philippines
Team Leader	Mr. Ram Desai



Team Member	Mr. Adarne Crispo
Technical Reviewer	Mr. Nyugen Hong Linh