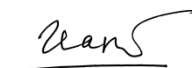





**Validation report form for renewal of crediting period for
CDM project activities
(Version 03.0)**

Complete this form in accordance with the instructions attached at the end of this form.

BASIC INFORMATION

Title and UNFCCC reference number of the project activity	NorthWind Bangui Bay Project UNFCCC ID: 0453
Number and duration of the next crediting period	CP No.: 3 rd Duration: 01 May 2019 – 30 Apr 2026
Version number of the validation report	Version 02
Completion date of the validation report	21 Sep 2019
Version number of PDD to which this report applies	Version 07.1, dated 20 Sept 2019
Project participants	NorthWind Power Development Corporation (host)
Host Party	Philippines
Applied methodologies and standardized baselines	CDM Methodology: ACM0002: Grid-connected electricity generation from renewable sources - Version 19.0 No standardized baseline
Mandatory sectoral scopes	Scope: 1: Energy industries (renewable/ non-renewable sources)
Conditional sectoral scopes, if applicable	N/A
Estimated amount of annual average GHG emission reductions or GHG removals by sinks in the next crediting period	59,268 tCO ₂
Name and UNFCCC reference number of the DOE	EPIC Sustainability Services Private Limited (E-0062)
Name, position and signature of the approver of the validation report	<p>Nguyen Hong Ngoc Trang, Lead Auditor</p> <p style="text-align: center;"></p> <p>K. Suryanarayana Murthy , Managing Director (approver of this report)</p> <p style="text-align: center;"></p>

SECTION A. Executive summary

>>

NorthWind Power Development Corporation (hereinafter NorthWind or Project participant or PP) had engaged EPIC to perform validation of renewal of crediting period from 01 May 2019 – 30 Apr 2026 (Third crediting period) for the project activity titled “NorthWind Bangui Bay Project” (hereinafter called “the project”). The project activity involves installation of a newly built wind turbine power project, which supplies the power energy to Philippines’ Luzon-Visayas grid and contributes to the reduction of GHG emission by replacing part of electricity of Luzon-Visayas Grid which is dominated by fossil fuel-fired power plants. The project construction and operation meets the Philippine environmental standards and an Environmental Impact Assessment ^{/15//16/} for the project has been approved.

Technology transfer involves purchase of the state-of-the-art model of wind turbines designed, tested and manufactured by NEG Micon (NEGM). NEGM is one of the world’s leading suppliers of wind turbines and has supplied equipment for approximately 20% of the world’s wind power capacity.

The purpose of the validation is to assess the validity of the original baseline and whether the emission reductions are in line with the valid version of the applicable methodology and, applicable standardized baseline if any. The validation consists of checking the project’s baseline, the monitoring plan, and the project’s compliance with relevant UNFCCC and host country criteria in order to confirm that the project design, baseline, monitoring plan and calculation of emission reductions as documented is sound and reasonable and meets the stated requirements and identified criteria.

This report summarizes the findings of the validation of the project, performed on the basis of UNFCCC criteria for CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to the Kyoto Protocol, the CDM rules and modalities as agreed in the Bonn Agreement, the Marrakech Accords and the CDM Executive Board’s decisions. EPIC has employed a risk-based approach in the validation based on the recommendations in the Validation and Verification Standard for project activities version 2.0^{/1/} (hereinafter referred to as VVS), focusing on validity of applied methodology, baseline, monitoring plan and emission reduction calculations as documented in the updated PDD version 07.1, dated 20 Sept 2019^{/12/}. The validation is not meant to provide any consulting towards the client. However, the stated requests for clarifications and/or corrective actions may provide input for improvement of the project design.

SECTION B. Validation team, technical reviewer and approver**B.1. Validation team member**

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)	Involvement in			
						Desk/document review	On-site inspection	Interview(s)	Validation findings
1.	Lead Auditor (Team Leader)	IR	Nguyen	Hong Ngoc Trang	EPIC, Central office, Bangalore	√		√	√
2.	Auditor	IR	Anbazhagan	Prabu Das	EPIC, Central office, Bangalore	√			√

B.2. Technical reviewer and approver of the validation report for RCP

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)
1.	Technical reviewer	IR	Radhamadhavan	Vijayaraghavan	EPIC, Central office, Bangalore
2.	Approver-Managing Director	IR	Murthy	K. Suryanarayana	EPIC, Central office, Bangalore

SECTION C. Means of validation**C.1. Desk/document review**

>>

As a first step, the validation team has reviewed the PDD version 06^{/11/}, registered PDD^{/5/}, monitoring plan^{/5/}, previous validation reports^{/5/} and additional background documents submitted by the project participants. Based on the review, the validation team has issued corrective action requests/ clarification requests. As a result of these findings, the PP has revised the PDD version 07.1^{/12/} (hereinafter referred to as updated PDD). The resolution of the findings by the validation is presented in Appendix 4 of this report.

C.2. On-site inspection

Duration of on-site inspection: Not applicable				
No.	Activity performed on-site	Site location	Date	Team member

1.	<p>The validation requirements for the purpose of validating the renewal of crediting period are specified in Para 400 to 414 of VVS Version 02.0^{/1/}.</p> <p>As per para 402, the DOE shall apply the requirements in section 7.1.3 mutatis mutandis to validate the information provided by the project participants. Hence for site visit, the validation team applied para 30.</p> <p>As per para 30, it is mandatory for the DOE to conduct an on-site inspection at validation for the proposed CDM project activity if: (a) its estimated annual average of greenhouse gas (GHG) emission reductions or net anthropogenic GHG removals is more than 100,000 tCO₂e, or (b) there is pre-project information that is relevant to the requirements for registration of the project activity and may not be traceable after the registration.</p> <p>As project estimated annual average of greenhouse gas (GHG) emission reductions is well less than 100,000 tCO₂e, and all pre-project information relevant to requirements for registration of the project activity can be easily traceable after the registration, the validation team found that it is not explicitly required to conduct an onsite inspection. Hence, the validation team did not undertake onsite inspection.</p>			
...				

All information provided in the PDD version 07.1^{/12/} was verified during the desk-review phase against credible sources. The PDD applicable for the first crediting period and the PDD version 07.1^{/12/} apply the same methodology^{/5//7/} and applicable tools and include identical project design information. The validation team was able to confirm that all related information transferred to the PDD version 07.1^{/12/} is materially the same as that of the PDD applicable for the first crediting period. Details included in the PDD version 07.1^{/12/} about project design, construction and implementation phases, operation, meeting of applicability conditions for the applied methodology and applicable tools, GHG calculation approaches and monitoring practice for the project activity were not changed when compared to the PDD applicable for the previous crediting periods. The baseline scenario information/description was also sufficiently demonstrated not to be changed based on assessment of documented evidences (as assessed in Section D.3). By taking into account the above-mentioned aspects, the validation team decided that conducting a physical on-site visit as part of validation assessment was not necessary.

This is in conformity with the provisions of paragraphs 50-55 of CDM-VVS^{/1/} version 02.0. The interviews conducted by the validation team were by means of email and telephone communications, with details about such performed interviews presented in the Section C.3.

C.3. Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Pham	Tra Giang	Consultant – Northwind	17 Dec 2018	<ul style="list-style-type: none"> - Project history - Monitoring and measurement equipment and system. - Remaining lifetime of equipment - Crediting period - Baseline study assumptions - Validity of baseline - Roles & responsibilities of the project participants - National legislation - ER calculation - Ex-ante parameters - Changes of parameters - Editorial issues of the revised PDD 	Nguyen HN Trang, Lead Auditor
2.	Macapobre	Giovannie	VP for operation – Northwind	17 Dec 2018		Nguyen HN Trang, Lead Auditor
3.	Trinidad Germanil	Joanna	Chief Legal and Compliance officer – Northwind	17 Dec 2018		Nguyen HN Trang, Lead Auditor

C.4. Sampling approach

>>

No applicable

C.5. Clarification requests (CLs), corrective action requests (CARs) and forward action requests (FARs) raised

Area of validation findings	No. of CL	No. of CAR	No. of FAR
Compliance with PDD form	-	CAR 01 CAR 03 CAR 04 CAR 05 CAR 08 CAR 12	-
Application and selection of methodologies and standardized baselines	-	CAR 02 CAR 06 CAR 07	-
Validity of original baseline or its update	-	CAR 09 CAR 10	-
Estimated emission reductions or net anthropogenic removals	CL 02	-	-
Validity of monitoring plan	-	CAR 11	-
Crediting period	-	-	-
Project participants	CL 01	-	-
Post-registration changes	-	-	-
Others (please specify) Technical specification information	CL 03 CL 04	-	-
Total	4 CLs	12 CARs	No FAR

SECTION D. Validation findings**D.1. Compliance with PDD form**

Means of validation	As per the paragraph 406 of VVS ^{/1/} , the validation team has checked if PP used a later valid version of the PDD form ^{/8/} for the updated PDD. The validation team is to
----------------------------	---

	determine whether information transferred to the later valid version of the PDD form is materially the same as that in the registered PDD. The validation team has determined whether PP has updated the PDD and applicability section as per the latest version of the applied methodology, baseline section, calculation of emission reduction section, monitoring section and other relevant sections of the PDD in accordance with the requirements as per Project standard version 02.0 ^{/3/} (hereinafter referred to as Project Standard).
Findings	There are 5 CARs (CAR 01; CAR 03; CAR 04; CAR 05; CAR 08), refer to Appendix 4
Conclusion	The project design document uses the latest version of the PDD template ^{/8/} version 11 (CDM-SSC-PDD-FORM) which is currently applicable and hence acceptable. All relevant sections of the PDD is revised as per paragraph 279 of the Project Standard (Version 02.0) ^{/3/} and the instructions provided in the PDD template.

D.2. Application and selection of methodologies and standardized baselines

Means of validation	As per paragraph 404 b) of VVS ^{/1/} , the validation team has checked whether PP have used the valid version of the approved methodology (ACM0002 version 19.0) ^{/7/} (hereinafter referred to as applied meth) applied in the original PDD and have demonstrated the project to be in line with the applicable conditions specified therein.
Findings	There are 3 CARs (CAR 02; CAR 06; CAR 07), refer to Appendix 4
Conclusion	The validation team has concluded that PP has used the valid version of the applied meth and the project to be in line with the applicable conditions specified therein. Refer Appendix 5 of this report for more details.

D.3. Validity of original baseline or its update

Means of validation	<p>The following steps stipulated in the methodological tool “Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period”, version 03.0.1^{/9/}, were applied by the project activity, which is in line with the Project Standard (version 02.0)^{/3/}.</p> <p>Step 1: Assess the validity of the current baseline for the next crediting period</p> <p>Step 2: Update the current baseline and the data and parameters</p> <p>All necessary documentation has been either provided by the client or the validation team has acquired appropriate information required for assessment independently. For a detailed list of reviewed documentation please refer to appendix 3.</p>
Findings	There are 2 CARs (CAR 09; CAR 10), refer to Appendix 4
Conclusion	<p><u>Step 1: Assess the validity of the current baseline for the next crediting period</u></p> <p>As demonstrated in the registered PDD, the baseline scenario for the project activity is the continued operation of the grid-connected power plants and the addition of new generation sources to meet electricity demand as reflected in the combined margin (CM) calculations described in the “Tool to calculate the emission</p>

factor for an electricity system”.

As per the methodology ACM0002 Version 19.0^{7/}, the baseline for the project activity remains the same as that in the registered PDD as “Electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation source connected to Luzon-Visayas grid, as reflected in the combined margin (CM) calculations described in the “*Tool to calculate the emission factor for an electricity system*” Version 07.0.

The validity of the current baseline is assessed using the following sub-steps:

Step 1.1: Assess compliance of the current baseline with relevant mandatory national and/sectoral policies

Although national policies favour the development of renewable energy, electricity generated by fossil fuel based power plants dominated the electricity supply. There has been no significant change in the relevant national and/or sectoral policies since the date of registered PDD till now. Hence, it was concluded that the current baseline was complied with all relevant national and sectoral policies.

Step 1.2: Assess the impact of circumstances

The project technical characteristics remain the same. Renewable power generated by the project activity will be exporting to the Luzon-Visayas grid. After years of development, current conditions like build margin and operating margin of the Luzon-Visayas grid power generation are not the same as that was determined at the validation of the project activity. Therefore, baseline emissions need to be updated for the subsequent crediting period.

Step 1.3: Assess whether the continuation of the use of current baseline equipment(s) or an investment is the most likely scenario for the crediting period for which renewal is requested.

The baseline is not the continuation of the current practice, as the project activity is a Greenfield project and consequently there was no equipment installed within the project boundary before the project implementation. Therefore, the sub-step is not applicable to the project activity.

Step 1.4: Assessment of the validity of the data and parameters

The emission factors have been updated by the project participants for the third crediting period of the project activity accordingly.

Step 2. Update the current baseline and the data and parameters

Step 2.1: Update the current baseline

As per the requirement of the sub-step, the update for baseline emissions of the second crediting period is based on ACM0002 Version 19.0^{7/} that is the latest approved version of the methodology applicable to the project activity at the time of request for renewal of the crediting period.

Step 2.2: Update the data and parameters

The emission factors for the project activity have been updated and determined ex-ante as a combined margin consisting of combination of the operating margin and build margin for the second crediting period by the project participants as per the “Tool to calculate the emission factor for an electricity system”, version 07.0.

EPIC was able to confirm that values applied in the calculation of the updated

emission factors were in line with the “Grid Emission Factor, issued by Department of Energy and DNA Philippine, public in their website as the link below:

<https://www.doe.gov.ph/electric-power/2015-2017-national-grid-emission-factor-ngef>

As confirmation letter that the validation team received from Department of Energy on 6 May 2019^{/17/}, they confirmed that:

- 1) This GEF figure is the most updated value
- 2) This GEF figure was computed using the UNFCCC “Tool to calculate the emission factor for an electricity system”

Therefore EPIC validation team found that those are sufficient evidence to confirm the correctness of the applied GEF value.

The updated PDD version 7.1 dated 20th Sep 2019 was submitted for crediting period renewal of the project activity.

Parameter	Previous value	Updated value	Reference
EG _{Grid,OM,y}	0.7549 (ton CO2/MWh)	0.7122 (ton CO2/MWh)	Philippine DNA website
EG _{Grid,BM,y}	0.355 (ton CO2/MWh)	0.5979 (ton CO2/MWh)	Philippine DNA website
EF _{grid,CM,y}	0.6550 (ton CO2/MWh)	0.6836 (ton CO2/MWh)	Philippine DNA website

The baseline emission factor is the weighted average of the OM emission factor and the BM emission factor. It is calculated as equation below:

$$EF_{Grid,CM,y} = EG_{Grid,OM,y} \times W_{OM} + EG_{Grid,BM,y} \times W_{BM}$$

For wind and solar project $W_{OM} = 75\%$ and $W_{BM} = 25\%$ is used. So the $EF_{Grid,CM,y}$ value is correctly calculated and updated.

These changes have been appropriately considered in the updated PDD.

Conclusion:

The original baseline scenario of the project as per the registered PDD is still valid for the 3rd crediting period. Most of the data and parameters determined ex-ante are still valid except for the emission factor, the emission factor was re-determined in the baseline emission calculation.

D.4. Estimated emission reductions or net anthropogenic removals

Means of validation	As per the Paragraph 412 a) iv of VVS Version 02.0 ^{/1/} , the validation team has assessed the approach of PP in calculating the estimated GHG emission reductions comply with the applied methodology ACM0002 version 19.0 ^{/7/} and other requirements of Project Standard, Version 02.0 ^{/3/} .
Findings	There is 1 CL (CL 02), refer to Appendix 4
Conclusion	The calculation of ERs is done as per the applied methodology (ACM0002, version

	<p>19.0)^{14/}. The calculation in the Excel spreadsheet^{14/} and the corresponding calculation tables in the PDD have been checked and no mistakes have been identified. The estimation of emission reductions for the 3rd crediting period is deemed plausible and conservative.</p> <p>All changes due to the upgraded methodology and the re-assessment of the baseline have been considered appropriately. The calculation in the Excel spreadsheet^{14/} and the corresponding calculation tables in the PDD have been checked and no mistakes have been identified. The estimation of emission reductions for the 3rd crediting period is deemed plausible and conservative.</p> <p>The validation has concluded that the estimation of emission reductions for the applicable crediting period of the registered CDM project activity. For details, refer Appendix 6 of this report</p>
--	--

D.5. Validity of monitoring plan

Means of validation	As per the Paragraph 412 a) clause iii of VVS, Version 02.0 ^{1/} , the validation team has assessed whether the approach and validity of the monitoring plan indicated in the updated PDD comply with the requirements of the applied methodology and other requirements of Project Standard, Version 02.0 ^{3/} .
Findings	There is 1 CAR (CAR 11), refer to Appendix 4
Conclusion	The validation has concluded that the monitoring plan of the updated PDD (version 7.1) is in line with the requirements of the applied methodology and implemented monitoring plan. For details, refer section D.4 and Appendix 6 of this report.

D.6. Crediting period

Means of validation	As per the Paragraph 412a clause v of VVS, Version 02.0 ^{1/} , the validation team has assessed whether the next crediting period of the registered CDM project activity commences on the day immediately after the expiration of the current crediting period and in accordance with paragraph 278 of Project Cycle Procedure version 2.0 ^{2/} (hereinafter referred to as PCP).
Findings	No finding
Conclusion	<p>As paragraph 278 of Project Cycle Procedure^{2/} a request for renewal of crediting period of the registered CDM project activity using the "Renewal of crediting period request form" (CDM-REN-FORM) together with the new version of the PDD and the validation report shall be submitted no earlier than 270 days prior to but no later than one year after.</p> <p>The last date of previous crediting period is 30 Apr 2019. If the submission is before 30 Apr 2020, it is still acceptable and the next renewable credit period can start immediately after the expiry of the current crediting period.</p>

D.7. Project participants

Means of validation	As per paragraph 412a clause ii of VVS ^{1/} , the validation team has checked whether the names of the PP in the updated PDD are consistent with that in the registered PDD ^{5/} and project webpage.
Findings	There is 1 CL (CL 01), refer to Appendix 4

Conclusion	The validation team, after reviewing the updated PDD and project webpage ^{/5/} , has concluded that the names are correctly specified in the updated PDD.
-------------------	--

D.8. Post-registration changes

Type of post-registration changes (PRCs)	Confirmation (Y/N)	Validation report for PRCs	
		Version	Completion date
Temporary deviations from the registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents ¹	N	NA	NA
Corrections	N	NA	NA
Change to the start date of the crediting period	N	NA	NA
Inclusion of a monitoring plan	N	NA	NA
Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other methodological regulatory documents	N	NA	NA
Changes to the project design	N	NA	NA
Changes specific to afforestation and reforestation project activities	N	NA	NA

SECTION E. Internal quality control

>>

After the completion of assessment by the validation team all the relevant documentation is submitted to a qualified, Independent Technical reviewer as part of EPIC' internal quality control system. A Technical reviewer team is appointed to review the draft final validation report (Draft FVR). The comments made by the Technical reviewer team are taken into consideration and incorporated in the final FVR. The technical reviewer team assesses whether all the reporting requirements have been fulfilled and whether all the issues raised were closed satisfactorily by the validation team with justification. The technical review process can also raise issues in this regard which is resolved further by the validation team to the satisfaction of the technical reviewer. The technical reviewer team either accepts or rejects the report made by the validation team. The final report (after resolutions of all findings) is then submitted to the Head-operations for review and approval.

SECTION F. Validation opinion

>>

EPIC performed the validation of the renewal of crediting period of the CDM project "NorthWind Bangui Bay Project" in the Philippines (UNFCCC registration Ref. No. 0453). The validation was performed on the basis of the specific criteria as per VVS, PS and PCP and other relevant requirements.

¹ Other standards, methodologies, methodological tools and guidelines (to be) applied in accordance with the applied(selected) methodologies are collectively referred to as the other (applied) methodological regulatory documents).

CDM-RCPV-FORM

The validation team has concluded that updated PDD uses the valid version of the PDD template and all the necessary instructions are followed in preparing the PDD. The names of the PP are consistent with that specified in the UNFCCC project webpage. The project activity confirms with all the applicable conditions of the valid version of the applied methodology. The baseline and monitoring methodology are applied in accordance with the applicable requirements of PS. The baseline, the estimated GHG emission reductions and the monitoring plan in the updated PDD comply with the applicable requirements in the PS. The next crediting period can commence on the day immediately after the expiration of the current crediting period.

In summary, it is opinion of EPIC that the project meets all relevant UNFCCC requirements for the CDM and is eligible for renewal of crediting period from 01 May 2019 to 30 Apr 2026.

Project title:	NorthWind Bangui Bay Project
UNFCCC ref no:	0453
Crediting period requested for renewal:	01 May 2019 – 30 Apr 2026 (third crediting period)
Updated PDD	Version 07.1, dated 20 Sept 2019
Sector and applied methodology	Sector 1: Energy industries (renewable - / non-renewable sources) ACM0002: Grid-connected electricity generation from renewable sources - Version 19.0
Estimated CER	59,268 tCO ₂ e/year

Appendix 1. Abbreviations

Abbreviations	Full texts
BM	Build Margin
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reductions
CL	Clarification Request
CO ₂	Carbon Dioxide
CO ₂ e	Carbon Dioxide Equivalent
DNA	Designate National Authority
DOE	Designated Operational Entity
EF	Emission Factor
ESSPL	EPIC Sustainability Services Private Limited
FAR	Forward Action Request
GHG	Greenhouse gases
IPCC	Intergovernmental Panel on Climate Change
kW	Kilo Watt
LoA	Letter of Approval
MoV	Means of Verification
NGCP	National Grid Corporation of the Philippines
NGEF	National Grid Emission Factor
PCP	Project Cycle Procedure
PDD	Project Design Document
PLF	Plant Load Factor
PP	Project Participant
PS	Project Standard
QA/QC	Quality Assurance/Quality Control
RCP	Renewal of Crediting Period
TRANSCO	National Transmission Corporation
UNFCCC	United Nations Framework Convention on Climate Change
VVS	Validation and Verification Standard
WESM	Wholesale Electricity Spot Market

Appendix 2. Competence of team members and technical reviewers

The following validation team has been assigned to carry out the verification of the project.

Name	Ms. Hong Ngoc Trang Nguyen	Mr. A. Prabu Das	Mr. R. Vijayaraghavan
Role	Lead Auditor	Auditor- team member	Technical Reviewer
Competence in	Sector 1 and Sector 13	Sector 1 and Sector 13 including TA 1.1. and TA	Sector 1 and Sector 13 including TA 1.1. and

relevant sectors	including TA 1.1.	13.1	TA 13.1
Responsibility	Document review, onsite, DVR preparation, DVR resolution, FVR preparation	Document review, DVR preparation, DVR resolution, FVR preparation	Technical review

Ms. Hong Ngoc Trang Nguyen, holds a MSc Degree in Environmental Study and B.Eng Degree in Environmental Technology. She is a certified Energy Auditor by Viet Nam Ministry of Industry and Trade. She has around 5 years of work experience in CDM consultancy and validation services. She has undergone extensive training on CDM validation and verification and is a qualified auditor for Sectoral Scope 1 in accordance with procedures of EPIC Sustainability Services Pvt. Ltd. She is also an ISO 14001 lead auditor certified by Professional Evaluation and Certification Board (PECB) and ISO 9001 lead auditor certified by IRCA.

Mr. A Prabu Das, holds a M. Tech Degree in Energy Conservation and Management and B. Tech Degree in Petro-chemical Technology. He is a certified Energy Auditor by Bureau of Energy Efficiency (BEE), Government of India. He has around 8 years of work experience in Design of biomass Power plants, preparing Techno Economic Feasibility Reports (TEFR), carrying out energy audits, of which last six years have been in CDM consultancy and validation services. He has undergone extensive training on CDM validation and verification and is a qualified lead auditor for Sectoral Scope 1 and 13 in accordance with procedures of EPIC Sustainability Services Pvt. Ltd. He is also an ISO 26000 lead auditor certified by Professional Evaluation and Certification Board (PECB).

Mr. R. Vijayaraghavan holds BE in Mechanical Engineering, M. Tech in Energy Conservation and Management and MBA in Technology Management. He is certified as Energy Auditor by Bureau of Energy Efficiency (BEE), Government of India. He has 12 years of working experience in energy sector including 6 years as validator. He has successfully completed around hundred CDM, VCS/GS projects. He has been qualified as Lead Auditor for Sectoral Scope 1 and 13.

Appendix 3. Documents reviewed or referenced

No	Author	Title	References to the document	Provider
1	UNFCCC	CDM validation and verification standard for project activities, Version 02.0, EB101 https://cdm.unfccc.int/sunsetcms/storage/contents/stored-file-20181221092105818/Reg_stan06v02.pdf	1	Publicly available
2	UNFCCC	CDM Project Cycle procedure for project activities, Version 02.0, EB101 https://cdm.unfccc.int/sunsetcms/storage/contents/stored-file-20181221092024737/PC_proc03v02.pdf	2	Publicly available
3	UNFCCC	CDM project standard for project activities, Version 02.0, EB101 https://cdm.unfccc.int/sunsetcms/storage/contents/stored-file-20181221092046526/Reg_stan04v02.pdf	3	Publicly available
4	UNFCCC	Glossary – CDM terms, Version 09.1 https://cdm.unfccc.int/sunsetcms/storage/contents/stored-file-	4	Publicly available

		20170831165429672/Glos_CDMv9_1.pdf		
5	UNFCCC	Registered PDD, Corresponding previous validation report https://cdm.unfccc.int/Projects/DB/DNV-CUK1149535405.35/view	5	Publicly available
6	UNFCCC	UNFCCC webpage indicating end date of previous crediting period https://cdm.unfccc.int/Projects/DB/DNV-CUK1149535405.35/view	6	Publicly available
7	UNFCCC	ACM0002: Grid-connected electricity generation from renewable sources --- Version 19.0 https://cdm.unfccc.int/methodologies/DB/VJI9AX539D9MLOPXN2AY9UR1N4IYGD	7	Publicly available
8	UNFCCC	CDM-PDD-FORM Project design document form, version 11.0 https://cdm.unfccc.int/sunsetcms/storage/contents/stored-file-20190531085438888/PDD_form05v11.pdf	8	Publicly available
9	UNFCCC	Tool to assess the validity of the original/current baseline and to update the baseline at the renewal of a crediting period, version 3.0.1 http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-11-v3.0.1.pdf	9	Publicly available
10	PP	Host country approval from Philippines DNA, dated 16 Dec 2005	10	PP
11	PP	Updated PDD Version 06.0, dated 30 Sept 2018	11	PP
12	PP	Final updated PDD Version 07.1, dated 20 Sept 2019	12	PP
13	PP	Equipment specification, issued by NEG Micon A/S, dated 2003	13	PP
14	PP	RCP Emission reduction calculation spreadsheet-3rd Crediting Period	14	PP
15	PP	Initial Environmental Examination Checklist, issued by Northwind, dated Nov 2000	15	PP
16	PP	Environmental Compliance Certificate, issued by Environmental Management Bureau, dated 12 May 2000	16	PP
17	PP	Most updated Grid Emission Factor public in website: https://www.doe.gov.ph/electric-power/2015-2017-national-grid-emission-factor-ngef Confirmation letter from Department of Energy on the NEF value and the calculation method, dated 6 May 2019	17	Publicly available
18	PP	Renewable Energy Payment agreement (REPA), issued by National Transmission Corporation, dated 8 May 2015	18	PP
19	PP	Production Estimation issued by NEG Micon A/S, dated 5 May 2003	19	PP
20	PP	Certificate of Registration No.WESC 2012-07-058, issued by Department of Energy, Republic of the Philippines, dated 26 th	20	PP

		Feb 2013		
21	PP	Connection agreement, signed between National Transmission Corporation and Northwind, dated 05 Apr 2005	21	PP
22	PP	Photographs of wind farm, Central Control Room, SCADA System and nameplate of the equipment taken by PP	22	PP
23	PP	EPC contract, signed between NEG Micon A/S and Northwind, dated 23 Nov 2003 Variation EPA contract, signed between Vestas Asia Pacific A/S and Northwind, dated 27 Nov 2003	23	PP
24	PP	Grid Connection Model	24	PP
25	PP	Site layout	25	PP
26	PP	Single line diagram	26	PP
27	PP	Renewable Energy Act 2008, Act No.9513, issued by Congress of Philippines, dated 28 Jul 2008	27	Publicly available
28	PP	Circular No.D02009-05-0008, rules and regulations implementing, issued by Department of Energy, Philippines	28	Publicly available
29	PP	Power statistics 2018, issued by Department of Energy	29	Publicly available

Appendix 4. Clarification requests, corrective action requests and forward action requests

Table 1. CL from this validation

CL ID	01	Section no.	A.4	Date: 31/05/2019
Description of CL				
The validation team see in the updated PDD, there is only one Project Participants were listed in the first page while in section A.4 there are 19 Project Participants. The Project Participants list in the updated PDD is also inconsistent with the Project Participant list of registered PDD and those listed in the UNFCCC registration website. Please clarify.				
Project participant response				Date: 23/06/2019
The project participant list in the first page has been added in consistency with section A.4 of the PDD				
Documentation provided by project participant				
Revised PDD, version 07.1, dated 27 Jul 2019 ^{/12/}				
DOE assessment				Date: 02/08/2019
The validation team has reviewed the updated PDD and found that there is only one Project Participant which is NorthWind Power Development Corporation (Philippines - host). All the other Participants has been withdrawal from the project. It has been clearly updated in the UNFCCC registration website.				
CL 01 is resolved and closed				

CL ID	02	Section no.	ER Spreadsheet Section B.6	Date: 31/05/2019
Description of CL				
Please clarify for the validate team how PP calculated the Grid Emission Factor. Please provide the evidence or the calculation sheet for cross-check.				
Project participant response				Date: 23/06/2019
<p>The Grid Emission Factor of the project has been updated to 2015-2017 data provided by Department of Energy, Republic of Philippines²</p> <p>The Department of Energy has been confirmed that the GEF is the updated one based on our computation last year covering the data from 2015-2017 generation data for Luzon, Visayas and Mindanao, which is also used in publishing the annual DOE Power Statistics. The updated NGEF was computed using UNFCCC, "Tool to calculate the emission factor for an electricity system" Version 5 (November 27, 2015).³</p>				
Documentation provided by project participant				
Letter of confirmation from Department of Energy, on the GEF, dated 6 May 2019 ^{/17/}				
DOE assessment				Date: 02/08/2019
<p>The Grid Emission Factor of the project has been updated to 2015-2017 data provided by Department of Energy, Republic of Philippines and was published in the their website as the link below:</p> <p>https://www.doe.gov.ph/electric-power/2015-2017-national-grid-emission-factor-ngef</p> <p>The validation team also received the confirmation email from the Department of Energy ^{/17/}, Republic of Philippines confirmed that:</p> <ul style="list-style-type: none"> - The current GEF published in the DOE website is the most updated value; - They applied "Tool to calculate the emission factor for an electricity system" Version 05.0 which was the most updatest version at that moment for the calculation of the GEF value. <p>The validation team has reviewed the different of Version 07.0 and Version 05.0 of "Tool to calculate the emission factor for an electricity system" and confirmed that the revision did not impact the computation method of the GEF.</p> <p>Therefore EPIC validation team found that those are sufficient evidences to confirm the correctness of the applied GEF value.</p> <p>CL 02 is resolved and closed</p>				

CL ID	03	Section no.	A.3	Date: 31/05/2019
Description of CL				
Please provide for the validation team the feasibility study report & equipment contract agreement for our desk review and cross-check for all the technical details of project provided in the PDD				
Project participant response				Date: 23/06/2019
The Feasibility Study Report and Equipment Contract agreement have been provided to DOE for review.				
Documentation provided by project participant				
<ul style="list-style-type: none"> - Production Estimation issued by NEG Micon A/S, dated 5 May 2003 ^{/19/} - EPC contract, signed between NEG Micon A/S and Northwind, dated 23 Nov 2003 ^{/23/} - Variation EPA contract, signed between Vestas Asia Pacific A/S and Northwind, dated 27 Nov 2003 ^{/23/} 				
DOE assessment				Date: 02/08/2019

² <https://www.doe.gov.ph/electric-power/2015-2017-national-grid-emission-factor-ngef>

³ Email confirmation on GEF by Department of Energy has been provided to DOE for review.

The validation team has reviewed all the information in the supporting evidence provided by PP and the detailed in the PDD, version 07.1, dated 27 Jul 2019 and confirmed that all the technical details of project has been accurately documented in section A.3 of the PDD. Those information is also consistent with the information in the previous registered PDD.

CL 03 is resolved and closed

CL ID	04	Section no.	A.1	Date: 31/05/2019
Description of CL				

Please clarify for the validation team why the project participant expects the load factor of the plant is 30% for 3rd crediting period as stated in the PDD.

Project participant response	Date: 23/06/2019
-------------------------------------	-------------------------

The attached is a document from Vestas supplier in 2004 presenting the AEP estimate for the project, that the plant can produce 105.93 GWh/year, which is 36.64% load factor. However, the PP expected the load factor of 30% for only conservative reason. Based on 30% plant load factor, the estimated generation is 86,724 MWh⁴ for a full year.

The early years of the first crediting period showed very low plant availability when a lot of failures involving major parts and components hitting different WTGs were encountered by the plant. This low availability data corresponds to low generation of the plant. But since the time Vestas implemented a lot of improvement and corrective works, plant availability has significantly improved, as shown in table below:

Year	Electricity Generation (MWh)	Plant Availability (%)
2005	17,307	51.6%
2006	50,599	72.0%
2007	56,478	86.6%
2008	60,063	81.2%
2009	63,135	83.1%
2010	60,428	86.3%
2011	87,166	92.5%

As shown in the table, the data for 2011 resulted in a total net generation of 87,166 MWh delivered by the project to the grid, equivalent to 30.15% load factor (just surpassing the target load factor of 30% in the PDD) The 30% capacity factor is realized not just for 2011 but realizable the following years as well. So the load factor of 30% was explained and accepted by the DOE during the validation of the 1st renewal process.

The below table shows the net actual generation of the project activity during the second crediting period, i.e. from 2012 to 2018, which is showing that annual net electricity generation of all years are below the load factor of 30%.

Year	Electricity Generation (MWh)	Plant Availability (%)
2012	74,638	89.86%
2013	64,959	84.07%
2014	73,066	87.59%
2015	50,111	90.68%
2016	60,018	85.05%
2017	75,378	90.65%
2018	81,969	90.38%

However, the load factor of 30% is maintained expectation for the 3rd crediting period, due to the following reasons:

1. The selected value was still lower than the estimated value during the development phase (i.e. 36.6% as

⁴ 33 MW*8760 hours*30% = 86,724 MWh

<p>in the FS). So technically, the load factor during the operation years can be reached at or lower than 36.6%. It is unlikely to get higher load factors during the operation period since the estimated load factor was calculated based on many input parameters which were technically considered as the most feasible values.</p> <p>Furthermore, due to the instability of wind resource, the PP has expected the load factor as 30% throughout the project lifetime for more conservative.</p> <p>2. After having a lot of improvement and correction works in 2009 and 2010, the load factor of 2011 was even a bit higher than expected value while the earlier years showing the very low values. So the PP expects that the load factor would be improved in next period if some maintenance and correction works supported by the equipment supplier in the future.</p>	
Documentation provided by project participant	
- Production Estimation issued by NEG Micon A/S, dated 5 May 2003 ^{/19/}	
DOE assessment	Date: 02/08/2019
<p>After reviewing all the supporting evidence and running data for the last 14 years, the validation team found that the PLF of 30% in the registered PDD is conservative and resonable.</p> <p>CL 04 is resolved & closed</p>	

Table 2. CAR from this validation

CAR ID	01	Section no.		Date: 31/05/2019
Description of CAR				
The CDM-PDD Form Version 10.1 is obsolete. CME/PP is requested to use valid version of the template as per the requirement of paragraph 22 PS-PoA Version 02.0.				
Project participant response				Date: 23/06/2019
The new version 11 of PDD template is applied for the project.				
Documentation provided by project participant				
Revised PDD, version 07.1 ^{/12/}				
DOE assessment				Date: 02/08/2019
<p>PP has submitted revised PDD with CDM-PDD form, Version 011.0 which is the most updated template.</p> <p>CAR 01 is closed.</p>				

CAR ID	02	Section no.		Date: 31/05/2019
Description of CAR				
<p>The updated PDD has applied the outdated version of ACM0002 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" Version 6.</p> <p>Please check and revise.</p>				
Project participant response				Date: 23/06/2019
The newest version of ACM0002 methodology has been updated in the PDD.				
Documentation provided by project participant				
Revised PDD, version 07.1 ^{/12/}				
DOE assessment				Date: 02/08/2019

PP has submitted revised PDD with the updated on the ACM0002 “Consolidated baseline methodology for grid-connected electricity generation from renewable sources” Version 19.0 which is the most updated version.

CAR 02 is resolved & closed

CAR ID	03	Section no.	A.1	Date: 31/05/2019
Description of CAR				
<p>Section A: Description of project activity – A.1. Purpose and general description of project activity</p> <p>As request of “Instructions for completing CDM-PDD-FORM, version 11.0”, please briefly clarify in this section</p> <ul style="list-style-type: none"> - The technologies/measures employed by the project activity; - The project boundary 				
Project participant response				Date: 23/06/2019
<p>The A.1 section has been updated on technology applied for the project and also the project boundary. And the new version of PDD has been also updated for the project.</p>				
Documentation provided by project participant				
Revised PDD, version 07.1 ^{/12/}				
DOE assessment				Date: 02/08/2019
<p>PP has revised the PDD and provide briefly clarify in section A.1 The technologies/measures employed by the project activity and The project boundary as the requirement of “Instructions for completing CDM-PDD-FORM, version 11.0”</p> <p>CAR 03 is resolved & closed</p>				

CAR ID	04	Section no.	A	Date: 31/05/2019
Description of CAR				
<p>Section A: Description of project activity – A.2. Location of project activity</p> <p>As request of “Instructions for completing CDM-PDD-FORM, version 11.0”, please briefly clarify in this section</p> <ul style="list-style-type: none"> - Provide details of the physical/geographical location of the project activity, including physical address (host Party, region/state/province, city/town/community, street name and number) and a map, and if necessary, other information allowing for the unique identification of the project activity (e.g. geographic coordinates). 				
Project participant response				Date: 23/06/2019
<p>The physical/geographical location of the project activity and also geographic coordinates of 20 WTGs have been updated more details in section A.2 of the PDD.</p>				
Documentation provided by project participant				
Revised PDD, version 07.1 ^{/12/}				
DOE assessment				Date: 02/08/2019

PP has revised the PDD and provide the details of the physical/geographical location of the project activity, including physical address (host Party, region/state/province, city/town/community, street name and number) and a map with the unique identification of the project activity. The validation team has reviewed and cross-checked with different supporting document and confirmed that those information has been provided correctly.

CAR 04 is resolved & closed

CAR ID	05	Section no.	A.3	Date: 31/05/2019
Description of CAR				
Section A3: Technologies and/or measures				
As request of "Instructions for completing CDM-PDD-FORM, version 11.0", please revisit the whole section to provide additional required details includes:				
<ul style="list-style-type: none"> - A list of the facilities, systems and equipment that was installed and/or modified by the project activity; - The arrangement of the facilities, systems and equipment; - The monitoring equipment and their location in the systems. - The age and average lifetime of the equipment based on the manufacturer's specifications and industry standards; - The existing and forecast installed capacities, load factors and efficiencies; - The energy and mass flows and balances of the facilities, systems and equipment, if necessary. - Provide a short summary of facilities, systems and equipment in the baseline scenario as established in section B.4 below. 				
Project participant response				Date: 23/06/2019
The section A.3 has been added regarding technologies and measures applied for the project activity as requested.				
Documentation provided by project participant				
Revised PDD, version 07.1 ^{/12/}				
DOE assessment				Date: 02/08/2019
PP has revised the PDD. The validation team has reviewed and found that all the details of technologies and measures applied for the project activity has been updated according to the requirement of "Instructions for completing CDM-PDD-FORM, version 11.0". The validation team cross-checked with the previous PDD and supporting evidence and would be able to confirm that all related information transferred to the PDD version 07.1 is materially the same as that of the PDD applicable for the first & second crediting period.				
CAR 05 is resolved & closed				

CAR ID	06	Section no.	B	Date: 31/05/2019
Description of CAR				
Section B: Reference of methodology and standardized baseline				
As request of "Instructions for completing CDM-PDD-FORM, version 11.0", please clarify in this section				
<ul style="list-style-type: none"> - Indicate exact reference (number, title, version) - Any tools and other methodologies to which the selected methodologies refer - The selected standardized baseline (if any, if not, please also state in the report) 				
Project participant response				Date: 23/06/2019

The details of methodology and referred tools applicable for the project has been provided in section B.1 of the PDD.

Documentation provided by project participant

Revised PDD, version 07.1 ^{/12/}

DOE assessment

Date: 02/08/2019

PP has revised the PDD. The validation team has checked and find all the methodologies and tools which the applied methodologies refer to are correctly indicated with exact reference (number, title, version).

CAR 06 is resolved & closed

CAR ID	07	Section no.	B2	Date:	31/05/2019
Description of CAR					
Section B.2. Project activity eligibility					
Please justify and elaborate again the project eligibility as it is not yet cover all the criteria require in the methodology ACM0002, version 19.					
Project participant response					Date:
					23/06/2019
The project activity eligibility has been updated to cover all the criteria required in the methodology ACM0002, version 19.					
Documentation provided by project participant					
Revised PDD, version 07.1 ^{/12/}					
DOE assessment					Date:
					02/08/2019
In the revised PDD, PP has clearly justify and elaborate the project eligibility in accordance with all the criteria required in the applied methodology ACM0002, Version 19					
CAR 07 is resolved & closed					

CAR ID	08	Section no.	B.3	Date:	31/05/2019
Description of CAR					
Section B.3. Project boundary					
As request of "Instructions for completing CDM-PDD-FORM, version 11.0", please clarify in this section					
<ol style="list-style-type: none"> 1) Define the project boundary of the project activity based on the guidance of the selected methodology(ies) emissions. 2) Present a flow diagram of the project boundary, physically delineating the project activity, based on the description provided in section A.3 above. Include in the flow diagram the equipment, systems and flows of mass and energy described in that section. In particular, indicate in the diagram the emission sources and GHGs included in the project boundary and the data and parameters to be monitored. 					
Project participant response					Date:
					23/06/2019
The new version 11 of PDD template is applied for the project.					
The section B.3 Project Boundary has been revised as the above requirements.					
Documentation provided by project participant					

Revised PDD, version 07.1 ^{/12/}	
DOE assessment	Date: 02/08/2019
<p>PP has revised the PDD. The validation team has reviewed and found that all the description of project boundary has been provided correctly in Section B.3. This fulfill the requirement of "Instructions for completing CDM-PDD-FORM, version 11.0". The flow diagram of project boundary with physically delineating the project activity was provided correctly.</p> <p>CAR 08 is resolved & closed</p>	

CAR ID	09	Section no.	B.4	Date: 31/05/2019
Description of CAR				
Section B.4. Establishment and description of baseline scenario				
As request of "Instructions for completing CDM-PDD-FORM, version 11.0", please provide in this section				
<ol style="list-style-type: none"> 1) Describe the baseline scenario for the project activity and explain how it is established in accordance with applicable provisions for the establishment and description of baseline scenarios in the project standard, the applied methodologies. 2) Where the procedure in the applied methodologies, and where applicable, the applied standardized baselines involves several steps, describe how each step is applied and transparently document the outcome of each step. Explain and justify key assumptions and rationales. Provide and explain all data used to establish the baseline scenario (variables, parameters, data sources, etc.). Provide all relevant documentation and/or references. 3) Describe how the relevant national and/or sectoral policies, regulations and circumstances are taken into account in accordance with the project standard. 				
Project participant response				Date: 23/06/2019
Section B.4 has been updated to cover all the above required information.				
Documentation provided by project participant				
Revised PDD, version 07.1 ^{/12/}				
DOE assessment				Date: 02/08/2019
<p>PP has revised the PDD. The validation team has reviewed and found that all the description of baseline scenario has been provided correctly in Section B.4. This fulfill the requirement of "Instructions for completing CDM-PDD-FORM, version 11.0". PP also explain how the relevant national and/or sectoral policies, regulations has taken in account to assess the baseline scenario. Tool "Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period" (version 3.0.1) is adopted to assess the continued validity of the baseline and to update the baseline. The analysis has been provided in the revised PDD, the validation tea, has reviewed and found it plausible.</p> <p>CAR 09 is resolved & closed</p>				

CAR ID	10	Section no.	B.3	Date: 31/05/2019
Description of CAR				
<p>Based on the Tool to assess the validity of the original/current baseline and to update the baseline at the renewal of a crediting period, the validation team would like to requests further analysis and supporting evidences to demonstrate that</p>				

- 1) The original baseline is still valid
- 2) Renewable Energy Act of 2008 did not affect the baseline.

Project participant response**Date:** 01/06/2019

There are no new national and/or sectoral policies come into effect after the submission of the project activity or the submission of the previous request of renewal of the crediting period. The current baseline complies with all national laws and/or sectoral policies. Furthermore, the Energy Regulatory Commission of Republic of the Philippines issued the Certificate of Compliance (COC) to the proposed project and the project participant of Northwind Power Development Corporation, confirming that the project participant and the proposed project complied with all the requirements stipulated in the republic Act and the guidelines for the issuance of the COC on 15 June 2015.

Hence, in the absence of the project activity the electricity would still have been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the "Tool to calculate the emission factor for an electricity system"

The baseline scenario identified at the validation of the project activity was the continuation of the current practice without any investment. Baseline emissions are primarily derived from the fossil fuel power plants in Luzon-Visayas Grid. The Renewable Energy Act of 2008 (RA) came into effect from December 2008 which is known as the new Law aiming to provide incentives to promote the development and use the renewable energy in Philippines. However, the REA has not been affecting the baseline as the electricity generated from fossil fuel power plants was still predominant of Luzon-Visayas Grid, even slightly increased from the first crediting period to the second one, and apparently the share of renewable energy seemed to be declining as it can be seen in the table B.4.1 below.

Table B.4.1- showing how the total generation produced by fossil fuel power plants in Luzon-Visayas Grid which are calculated following DOE's data as of 31/12/2018, released on 29/03/2019.⁵

Average of	The first crediting period (2005-2012)	The second crediting period (2012-2019)
Fossil Fuel (FF)		
Electricity generation produced by fossil fuel power plants (MWh)	42,995,194	60,396,240
Percentage of electricity generation produced by fossil fuel power plants (%)	73%	78%
Renewable Energy (RE)		
Electricity generation produced by RE plants (MWh)	14,372,083	16,462,071
Percentage of electricity generation produced by RE plants (%)	27%	22%

Due that similar circumstances prevail as when the first and second PDDs were submitted for the first and second registrations respectively, the continued validity of the current baseline is plausible.

The further analysis and supporting evidences to demonstrate that the original baseline is still valid and Renewable Energy Act of 2008 did not affect the baseline has been added in section B.4 of the PDD.

Documentation provided by project participant

- Renewable Energy Act 2008, Act No.9513, issued by Congress of Philippines, dated 28 Jul 2008^{/27/}
- Power statistics 2018, issued by Department of Energy^{/29/}

DOE assessment**Date:** 02/08/2019

5

https://www.doe.gov.ph/sites/default/files/pdf/energy_statistics/03_2018_power_statistics_as_of_29_march_2019_generation_per_type.pdf

The validation team confirmed that the Government of Philippines (GoP) issued the Republic Act No. 9513 to provide incentives to promote the development and use of renewable energy in the Philippines. The new law provides following incentives for the renewable energy sector: seven-year income tax holiday and tax exemptions for the carbon credits generated from renewable energy sources. However, this incentive is given for new developed project. Since Northwind project start operation before 2008, it doesn't receive this incentive.

The validation team also checked the official website of the Philippine Department of Energy, and could confirm that Act No.9513 is the only relevant Public Act for the proposed project. Also by reviewing the Grid Emission Factor of Luzon-Visayas Grid, the validation team found that it is still dominated by as the electricity generated from fossil fuel power plants. Therefore, The validation team confirms that there have been no changes in the relevant national and/or sectoral regulations since the previous crediting period that could have affected the baseline scenario.

CAR 10 is resolved & closed

CAR ID	11	Section no.		Date: 31/05/2019
Description of CAR				
Please clarify in the PDD how the data would be archived and calibrated and be kept in accordance with ACM0002 "Grid-connected electricity generation from renewable sources" - Version 19.0.				
Project participant response				Date: 01/06/2019
The PDD has been revised in accordance with ACM0002 "Grid-connected electricity generation from renewable sources" - Version 19.0.				
Documentation provided by project participant				
Revised PDD, version 07.1 ^{/12/}				
DOE assessment				Date: 02/08/2019
PP has revised the PDD and indicated that all data collected as part of monitoring should be archived electronically and be kept at least for two years after the end of the last crediting period. The validation team found that this comply with the applied methodology ACM0002 "Grid-connected electricity generation from renewable sources" - Version 19.0.				
CAR 11 is resolved & closed				

CAR ID	12	Section no.	C	Date: 21/12/2018
Description of CAR				
As request of "Instructions for completing CDM-PDD-FORM, version 11.0"				
Section C.1. Start date of project activity				
<ul style="list-style-type: none"> - please provide in this section "how the start date has been determined in accordance with the definition of start date provided in the "Glossary: CDM terms", and provide evidence to support this date". 				
Section C.2. Expected operational lifetime of project activity				
<ul style="list-style-type: none"> - State the expected operational lifetime of the project activity in years and months 				
Section C.3.1 Type of crediting period				
<ul style="list-style-type: none"> - For the renewable crediting period type, please indicate whether it is the first, second or third crediting period. 				

Section C.3.3. Duration of crediting period	
- State the length of the crediting period of the project activity in years and months.	
Project participant response	Date: 01/06/2019
<p>1. The start date of the project is ground breaking ceremony of Northwind project, i.e.24/04/2004, which is considered is the earliest date at which either the implementation or construction or real action of a CDM project activity or PoA begins. The start date selection has been validated and approved during the first registration and second renewal validation of the project, hence it will still be kept the same over the last crediting period.</p> <p>The documented evidence to support this date has been provided to DOE for validation.</p> <p>2. Stated the expected operational lifetime of the project activity in years and months</p> <p>3. Stated the length of the crediting period of the project activity in years and months</p>	
Documentation provided by project participant	
Revised PDD, version 07.1 ^{/12/}	
DOE assessment	Date: 02/08/2019
<p>PP has revised the PDD which indicated all the information according to the requirement of "Instructions for completing CDM-PDD-FORM, version 11.0" The start date of the project is 24 Apr 2004 which is consistent with the start date of project indicated in previous PDD report and supporting documents.</p> <p>CAR 12 is resolved & closed</p>	

Table 3. FAR from this validation

FAR ID	xx	Section no.		Date: DD/MM/YYYY
Description of FAR				
Project participant response				Date: DD/MM/YYYY
Documentation provided by project participant				
DOE assessment				Date: DD/MM/YYYY

Appendix 5:

Applicability Criteria for Applied Meth ACM0002	Justification
3) This methodology is applicable to grid-connected renewable energy power generation project activities that: (a) install a greenfield plant; (b) involve a capacity addition to (an) existing plant(s); (c) involve a retrofit of (an) existing operating plants/units; or (d) involve a rehabilitation of (an) existing plant(s)/unit(s); or (e) involve a replacement of (an) existing plant(s)/unit(s).	<i>Applicable. The project activity will involve installing a new wind power plant at the site where no renewable power plant was operated prior to the implementation of the project activity (Greenfield plants)</i>
4) The methodology is applicable under the following conditions:	

<p>(a) The project activity may include renewable energy power plant/unit of one of the following types: hydro power plant/unit with or without reservoir, wind power plant/unit, geothermal power plant/unit, solar power plant/unit, wave power plant/unit or tidal power plant/unit;</p>	<p><i>Applicable</i> <i>The Project will consist of the installation of a wind power plant.</i></p>
<p>(b) In the case of capacity additions, retrofits, rehabilitation or replacements (except for wind, solar, wave or tidal power capacity addition projects the existing plant started commercial operation prior to the start of a minimum historical reference period of five years, used for the calculation of baseline emissions and defined in the baseline emission section, and no capacity expansion, retrofit, or rehabilitation of the plant/unit has been undertaken between the start of this minimum historical reference period and the implementation of the project activity.</p>	<p><i>Not relevant as the project activity does not involve capacity addition, retrofit or replacement of any existing wind power plant.</i></p>
<p>5) In case of hydro power plants, one of the following conditions shall apply⁶:</p>	
<p>a) The project activity is implemented in an existing single or multiple reservoirs, with no change in the volume of any of the reservoirs; or</p>	<p><i>Not relevant as the project activity will consist of a wind power plant</i></p>
<p>b) The project activity is implemented in an existing single or multiple reservoirs, where the volume of any of the reservoirs is increased and the power density, calculated using equation (3), is greater than 4 W/m²; or</p>	
<p>c) The project activity results in new single or multiple reservoirs and the power density, calculated using equation (3), is greater than 4 W/m².</p>	
<p>d) The project activity is an integrated hydro power plants involving multiple reservoirs where the power density of any of the reservoirs, calculated using equation (3), is lower than 4 W/m² all of the following conditions shall apply:</p> <ul style="list-style-type: none"> (i) The power density calculated using the total installed capacity of the integrated project, as per equation (4), is greater than 4 W/m²; (ii) Water flow between reservoirs is not used by any other hydropower unit which is not a part of the project activity; (iii) Installed capacity of the power plants with power density lower than or equal to 4 W/m² shall be: <ul style="list-style-type: none"> a. Lower than or equal to 15 MMW; and b. Less than 10 per cent of the total installed capacity of integrated hydro power project. 	<p><i>Not relevant as the project activity will consist of a wind farm power plant</i></p>

⁶ Project participants wishing to undertake a hydroelectric project activity that result in a new reservoir or an increase in the volume of an existing reservoir, in particular where reservoirs have no significant vegetative biomass in the catchments area, may request a revision to the approved consolidated methodology.

<p>6) In the case of integrated hydro power projects, project proponent shall:</p> <p>(a) Demonstrate that water flow from upstream power plants/units spill directly to the downstream reservoir and that collectively constitute to the generation capacity of the integrated hydro power projects; or</p> <p>(b) Provide an analysis of the water balance covering the water fed to power units, with all possible combinations of reservoirs and without the construction of reservoirs. The purpose of water balance is to demonstrate the requirement of specific combination of reservoirs constructed under CDM project activity for the optimization of power output. This demonstration has to be carried out in the specific scenario of water availability in different seasons to optimize the water flow at the inlet of power units. Therefore, this water balance will take into account seasonal flows from river, tributaries (if any), and rainfall for minimum five years prior to implementation of CDM project activity.</p>	<p><i>Not relevant as the project activity will consist of a wind farm power plant</i></p>
<p>7) The methodology is not applicable to the following:</p> <p>a) Project activities that involve switching from fossil fuels to renewable energy sources at the site of the project activity, since in this case the baseline may be the continued use of fossil fuels at the site;</p> <p>b) Biomass fired power plants/units;</p>	<p><i>Not relevant for project activity since: The project activity will be a Greenfield wind energy project, so there will be no fuel switching.</i></p>
<p>8) In the case of retrofits, replacements, rehabilitations, or capacity additions, this methodology is only applicable if the most plausible baseline scenario, as a result of the identification of baseline scenario, is “the continuation of the current situation, that is to use the power generation equipment that was already in use prior to the implementation of the project activity and undertaking business as usual maintenance”.</p>	<p><i>Not relevant The project activity is not a case of retrofit, replacement or capacity addition. The project activity is a Greenfield project.</i></p>

Appendix 6:

Parameters	Justification by the verification team
<p><u>Emission reductions (ER_y)</u></p>	<p>As per updated PDD,</p> <p>Emission reductions are calculated as follows.</p> $ER_y = BE_y - PE_y - LE_y$ <p>Where:</p> <p>BE_y – Baseline emissions</p> <p>PE_y – Project emissions</p> <p>LE_y – Leakage emissions</p>
<p><u>Baseline Emissions</u></p> <p>CO₂ emission from electricity generation in fossil fuel fired power plants that is displaced due to the project activity</p>	<p>As per para 42 and equation 11 of applied methodology (ACM0002 Version 19)⁷⁷, baseline emission BE_y are calculated as follows:</p> $BE_y = EG_{PJ,y} \times EF_{grid,y}$ <p>Where:</p>

	<p>$EG_{PJ,y}$: net electricity generation that is produced and fed into the grid</p> <p>$EF_{grid,y}$: Combined margin CO₂ emission factor for grid connected power generation in year y</p>
<p>Parameter $EG_{y, facility}$</p> <p>Quantity of net electricity generation supplied by the project plant/unit to the grid in year y (MWh)= 49,130 MWh/year.</p>	<p>Following para. 44 of ACM0002 version 19.0, if the project activity is the installation of a greenfield power plant, then:</p> $EG_{PJ,y} = EG_{PJ, facility,y}$ <p>The annual net generated electricity of the project is estimated to be $EG_{PJ,y} = 86,700$ MWh/year (based on Production estimation^{/19/})</p> <p>During the crediting period, this parameter is calculated from $EG_{y, export}$ and $EG_{y, import}$</p> $EG_{y, facility} = EG_{y, export} - EG_{y, import}$ <p>Where:</p> <p>$EG_{y, import}$: Electricity supplied by the grid to the proposed hydropower plant</p> <p>$EG_{y, export}$: Electricity supplied by the proposed hydropower plant to the national grid</p> <p>Those parameter will be monitored during crediting period using bi-directional energy meter to measure the electricity supplied by the Grid to the hydropower plant and by the hydropower plant to the Grid</p> <p>QA/QC procedure:</p> <p>PP proposed to employ an internal QA audit process to ensure the accuracy of the data and monitoring activities are conducted in accordance with the monitoring plan. Hence accepted by the validation team.</p>
<p>Parameter $EF_{grid, CM, y}$</p> <p>CO₂ emission factor for grid connected power generation</p> <p>$(EF_{grid, CM, y})=0.6836$ tCO₂e/MWh</p>	<p>For the ex-ante estimation:</p> <p>The emission factor ($EF_{grid, CM, y}$) is calculated by using the version of the "Tool to calculate the emission factor for an electricity system", version 7.0. It is determined ex-ante and consists of the weighted average factors of operating margin (EF_{OM}) and build margin (EF_{BM}).</p> <p>The data source and process of calculation OM and BM are based on the data that is available at the time of submission of the updated CDM-PDD^{/11/} for validation. NEF value is available publicly on the website of Department of Energy, Philippines:</p> <p>https://www.doe.gov.ph/electric-power/2015-2017-national-grid-emission-factor-ngef</p> <p>The validation team also received an email from Department of Energy confirmed that the GEF value on the website is the most updated one and they applied the "Tool to calculate the emission factor for an electricity system" for the computation</p>

	<p>of this value.</p> <p>EF_{OM} and EF_{BM} are calculated as 0.7122 tCO₂e/MWh and 0.5979 tCO₂e/MWh. In accordance with ACM0002 that weight factors of $w_{OM} = 0.75$; $w_{BM} = 0.25$ have been used to calculate the grid emission factor $EF_{grid,CM,y}$ (0.6836 tCO₂e/MWh).</p> <p>During the crediting period:</p> <p>It is fixed for the entire duration of crediting period</p>
<p><u>Baseline emission:</u></p> <p>Ex-ante calculation of baseline emissions as ACM0002 are calculated as follows.</p> <p>$BE_y = EG_{y, facility} \times EF_{grid,CM,y} = 0.6836 \times 86,700 = 59,268 \text{ tCO}_2$</p>	
<u>Project emissions (PE_y)</u>	<p>Following para. 34 of ACM0002 (version 19.0), For most renewable energy power generation project activities, $PE_y = 0$. However, some project activities may involve project emissions that can be significant. These emissions shall be accounted for as project emissions by using the following equation:</p> $PE_y = PE_{FF,y} + PE_{GP,y} + PE_{HP,y}$ <p>Where:</p> <p>PE_y : Project emissions in year y (t CO₂e/yr)</p> <p>$PE_{FF,y}$: Project emissions from fossil fuel consumption in year y (t CO₂/yr)</p> <p>$PE_{GP,y}$: Project emissions from the operation of dry, flash steam or binary geothermal power plants in year y (t CO₂e/yr)</p> <p>$PE_{HP,y}$: Project emissions from water reservoirs of hydro power plants in year y (t CO₂e/yr)</p>
<u>Parameter $PE_{FF,y}$:</u> Project emissions from fossil fuel consumption in year y	<p>For all renewable energy power generation project activities, emissions due to the use of fossil fuels for the backup generator can be neglected.</p> <p>Therefore $PE_{FF,y} = 0$.</p>
<u>Parameter $PE_{GP,y}$:</u> Project emissions from the operation of dry, flash steam or binary geothermal power plants in year y (t CO ₂ e/yr)	<p>The proposed project activity is not a geothermal power plant, $PE_{GP,y} = 0$.</p>
<u>Parameter $PE_{HP,y}$:</u> Methane emissions from reservoirs	<p>The proposed project activity is not a hydro power plant, $PE_{HP,y} = 0$</p>
<p><u>Project emissions (PE_y) =0 tCO₂e</u></p> <p>It is calculated as follows</p>	

$$PE_y = PE_{HP,y} + PE_{FF,y} = 0 \text{ tCO}_2\text{e} + 0 \text{ tCO}_2\text{e} = 0 \text{ tCO}_2\text{e}$$

Leakage (LE_y)= 0 tCO₂e

Following para 56. ACM002 version 19.0, no other leakage emissions are considered. The emissions potentially arising due to activities such as power plant construction and upstream emissions from fossil fuel use (e.g. extraction, processing, transport etc.) are neglected.

$$LE_y = 0.$$

Emission reductions

As per the applied methodology, Emission reductions are calculated as follows.

$$ER_y = BE_y - PE_y - LE_y = 59,268 \text{ tCO}_2 - 0 \text{ tCO}_2 - 0 \text{ tCO}_2$$

$$ER_y = 59,268 \text{ tCO}_2$$