

VALIDATION OF 49.5 MW WIND POWER PROJECT BY FFCEL IN PAKISTAN



BUREAU VERITAS CERTIFICATION HOLDING SAS
67/71 Boulevard du Château, 92200 Neuilly sur Seine, France
Tél. : +33 (0)1 55 24 70 00
Fax : +33 (0)1 55 24 70
climatechange.ops@uk.bureauveritas.com
www.bureauveritas.com

Project Title	49.5 MW Wind Power Project by FFCEL in Pakistan
Version	1.1
Report ID	BVCH/VCS/Pakistan/Validation Report/2014

Report Title	Validation of 49.5 MW Wind Power Project by FFCEL in Pakistan
Client	FFC Energy Limited
Pages	34
Date of Issue	01-11-2014
Prepared By	Bureau Veritas Certification Holdings SAS.
Contact	67/71 Boulevard du Château, 92200 Neuilly sur Seine, France, Tél. : +33 (0)1 55 24 70 00, climatechange.ops@uk.bureauveritas.com
Approved By	Ms. Anna Kalacheva Climate Change Operations – Accreditation Coordinator
Work Carried Out By	Mr. Anupam Badola – Team Leader Mr. Imran Altaf Bhatti – Team Member Mr. Feroz Baig – Team Member Mr. Sanjay Patankar – Internal Technical Reviewer Mr. Pramod Kamble – Specialist supporting ITR

Summary:

Bureau Veritas Certification Holding SAS was appointed by M/s FFC Energy Limited to conduct the validation of the “49.5 MW Wind Power Project by FFCEL in Pakistan” located at Jhimpir, District Thatta, Sindh, Pakistan. The validation is conducted on the basis of Verified Carbon Standard Version 3 (VCS Standard Ver 3.4 issued on 08/10/2013), as well as criteria given to provide for consistent project operations, monitoring and reporting. Validation team also referred to VCS Validation and Verification Manual, Ver 3.1 issued on 08/10/2013 as guidance document for the VVBs in conducting validation and verification of GHG projects.

The validation scope is defined as an independent review and ex-ante determination by the Designated Operational Entity of the additionality of the project and application of consistent and most appropriate baseline scenario as per applied methodology. It consisted of the following three phases:

- i) Desk review of the project design, baseline and monitoring plan, project technical details along with review of stakeholders consultation 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 project activity is to generate power (electrical energy) from renewable energy (wind energy), which displaces power generation from fossil fuel in the grid connected power plants; that would have been the scenario in absence of the project activity, thus achieve GHG emission reduction due to utilization of renewable energy.

The validation is based on the documents like VCS-PD, Emission Reduction calculations and other supporting documents provided to the validation team. This validation is carried out in accordance with VCS Standard version 3.4, dated 8th October 2013 and VCS Program Guide version 3.5 dated 8th October 2013.

In summary, Bureau Veritas Certification confirms that the project is implemented as planned and described in VCS project design. The identified baseline scenario to the project activity is in line with the applied CDM methodology ACM0002 / Version 15.0. Project participant demonstrated the additionality of the project by demonstrating that project is first of its kind. Validation team confirms that the emissions reductions that will be generated from the project are additional to the identified baseline scenario and project will remain additional during crediting period. Hence Bureau Veritas Certification (BVCH) recommends the project activity for registration under Verified Carbon Standard Ver. 3.4 mechanism.

Table of Contents

Abbreviations:	4
1 Introduction	5
1.1 Objective	5
1.2 Scope and Criteria	5
1.3 Level of Assurance.....	5
1.4 Summary Description of the Project	5
2 Validation Process	6
2.1 Method and Criteria.....	6
2.2 Document Review	6
2.3 Interviews	7
2.4 Site Inspections	7
2.5 Resolution of Findings.....	8
2.6 Forward Action Requests.....	8
3 Validation Findings.....	9
3.1 Project Details	9
3.2 Application of Methodology.....	11
3.2.1 Title and Reference	11
3.2.2 Applicability	11
3.2.3 Project Boundary.....	14
3.2.4 Baseline Scenario	15
3.2.5 Additionality	16
3.2.6 Quantification of GHG Emission Reductions and Removals	16
3.2.7 Methodology Deviations.....	18
3.2.8 Monitoring Plan	18
3.3 Non-Permanence Risk Analysis.....	19
3.4 Environmental Impact	19
3.5 Comments by Stakeholders.....	20
4 Validation conclusion	20
APPENDIX 1: Validation Findings (Resolution of Corrective/ Forward Actions/ Clarification Requests) ...	22
APPENDIX 2: List of documents reviewed	29
APPENDIX 3: List of documents available publicly	31
APPENDIX 4: Persons interviewed	32
APPENDIX 5: Curricula vitae of the VVB's validation team members	33

Abbreviations:

VCS	VERIFIED CARBON STANDARD
VCU	Verified Carbon Unit
VVB	Validation/ Verification Body
CAR	Corrective Action Request
CL	Clarification Request
FAR	Forward Action Request
FFCEL	FFC Energy Limited
CO ₂	Carbon Dioxide
DOE	Designated Operational Entity
DR	Document Review
GHG	Green House Gases
MV	Means of Verification
MP	Monitoring Plan
VCS-PD	Verified Carbon Standard -Project Description
kWh	Kilowatt-hour
MWh	Megawatt-hour
EF	Emission factor
EPA	Energy Purchase Agreement
JMR	Joint Meter Reading
WTG	Wind Turbine Generator

1 INTRODUCTION

1.1 Objective

The validation serves as project design verification and is a requirement of all projects. 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 VCS rules and host country criteria are validated in order to confirm that the project design, as documented, is sound and reasonable, and meets the applicable VCS requirements and the identified criteria. Validation is a requirement for all VCS projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of verified carbon units (VCUs).

1.2 Scope and Criteria

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 VCS rules and guidance along with associated interpretations. 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 Level of Assurance

Based on the process and procedures conducted, it can be concluded that the GHG assertion is materially correct and is a fair representation of GHG data and information. The level of assurance of the validation is reasonable. Validation team has checked the information wherever required during validation and confirms the validation assessment as per reasonable level of assurance.

1.4 Summary Description of the Project

The project activity is renewable power generation from wind and supply of the power to the grid. The total installed capacity of the project activity is 49.5 MW equipped with 33 WTGs of 1.5 MW installed capacity each. The project is located at Jhimpir, District Thatta, Sindh, Pakistan.

The project activity harnesses wind energy to generate and supply electricity to the grid. The conversion process utilizes aerodynamic forces (lift and/or drag) to produce a net positive turning moment on a shaft, resulting in the production of mechanical power which can be converted to electrical power. The employed WTGs can only convert wind energy into electrical energy and do not use any other fuel as input for electricity generation. The operation of WTGs is emission free and no GHG emissions are produced during the lifetime of the project activity.

The power generated by wind power plant station is evacuated by 132 kV transmission lines to National Transmission & Despatch Company (NTDC) Limited as per the Energy Purchase Agreement (EPA) signed between the PP & NTDC.

Validation team during site visit confirmed the technical specifications of turbine and generator along with technical specifications of all other equipments used up to power evacuation to NTDC. The project generates renewable electricity (wind power) and exports it to national grid of Pakistan. Hence, it reduces the dependency on fossils fuels which are pre-dominantly used for electricity generation in Pakistan and helps in reduction of greenhouse gas emissions.

As per feasibility study, the project activity shall generate 143.6 GWh electricity and shall result in emission reductions of 91,085 tCO₂e per year of operation and hence a total of 910,850 tCO₂e emission reductions over the 10-year crediting period.

2 VALIDATION PROCESS

2.1 Method and Criteria

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

In order to ensure transparency, a list of CARs and CLs along with detailed response from project participant is provided in tabular format in Appendix -1 of this report. The validation findings in forms of CARs, CLs and FARs were raised by validation team by referring the guidance notes provided in VCS-PD template which is available on VCS web site. The VCS Project Description template ver 3.2 dated 08th October 2013 provides the detailed instructions on how to complete each section of VCS-PD documents. It shows, in a transparent manner, criteria (requirements) to be followed and clear description on how to complete the VCS-PD document.

Validation team carried out validation activity by referring to requirements of VCS-PD along with VCS Standard ver 3.4 dated 8th October 2013. VCS Standard provides the requirement for developing projects, program and methodologies as well as requirements for validation, monitoring and verification of projects. Validation team also referred to Validation and Verification Manual ver 3.1 dtd 8th October 2013. It provides guidance to increase the consistency, quality and transparency of validation and verification of projects under the VCS Program. This is referred in combination with ISO 14064-3 which sets out program-neutral requirements for validation and verification, the means of validation and the results from validating the identified criteria.

2.2 Document Review

The validation team was provided with VCS Project Document along with other relevant documents for supporting the facts and description provided in VCS-PD like commissioning certificate, technical specifications, power evacuation arrangement, PPA etc. The documents were reviewed off-site and on-site assessment of the VCS PD and other related documents was carried out from 10/07/2014. The documents provided by FFC Energy Limited (project proponent) including VCS PD and additional background documents related to VCS PD, guidelines for completing VCS PD (VCS Version 3 dated 8th October 2013 v3.2), CDM approved methodology ACM0002 / Version 15.0; clarifications on validation requirements to be checked by Validation Body were reviewed. To address, Bureau Veritas Certification raised corrective action and clarification requests, FFCEL revised the VCS-PD and resubmitted Version 1.2 of VCS Project

Description on 28/10/2014. The validation findings presented in this report relate to the project as described in the VCS Project Description (VCS-PD), Version 1.2, dated 28/10/2014. This version of the Project Document is in line with the latest format for the VCS PD and guidance for completion of the VCS PD as provided by VCS Version 3.

2.3 Interviews

On 06/08/2014 & 07/08/2014 Bureau Veritas Certification made a site visit and performed interviews with project stakeholders to confirm selected information and to discuss issues identified in the document review. Representatives of FFC Energy Limited and local stakeholders were interviewed (see Appendix-4 at end of the report). The main topics of the interviews are summarized in Table 1.

Table 1: Interview topics

Interviewed organization	Interview topics
FFC Energy Limited (the Project Owner)	➤ Project background information and project implementation process. ➤ Project technology, operation and maintenance. ➤ Project approval and implementation status. ➤ Project management and monitoring plan. ➤ Government policies related to the project activity.
Local Stakeholders	➤ Project background in details ➤ Stakeholder comments ➤ Social and environmental impact of the project
Emergent Ventures (Project Consultant)	➤ Applicability of selected methodology. ➤ Baseline determination. ➤ Project additionality demonstration ➤ Emission reductions calculation. ➤ Emission reduction monitoring plan.

2.4 Site Inspections

The validation team visited the project site on 06/08/2014 & 07/08/2014 as per initial Validation /Verification site visit plan shared with project participant. Bureau Veritas certification as a standard part of validation and verification activity sends the Validation /Verification plan prior to site visit. As per the plan competent team of verifiers is sent to project site for carrying out validation/ verification activity. The validation plan provides detailed validation plan consisting of audit process and timings of the day during which specific events are audited. The plan is made flexible to accommodate site specific requirements during actual audit process. During validation of 49.5 MW wind power project by FFCEL, the on-site inspection process involved brief opening meeting with site personnel about validation and verification agenda for the day. It was followed by review of documents like VCS-PD, ER sheet and other site specific available documents. The site visit round was taken for interaction with project participants and power plant operation and maintenance team to understand the monitoring of GHG emission parameters at site. During physical site inspection, validation team visited each WTG installed at the power plant. The power

evacuation arrangement was also checked and validated as per description in VCS-PD. The power is evacuated through main and check meters installed at the project site.

2.5 Resolution of Findings

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 VCS and methodology 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 VCS 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 VCS-PD or supporting annexes are documented in the Validation findings in Appendix 1 and other additional Appendix to this report.

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 Findings in Appendix 1.

The Clarification, Corrective and Forward Action Requests are stated, where applicable, in the following sections. The validation of the Project resulted in 9 CARs i.e. Corrective action requests and 7 CLs i.e. Clarification requests.

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.

2.6 Forward Action Requests

During validation of project activity, no forward action requests were raised since project activity was already implemented and commissioned. Hence monitoring plan was in line in VCS-PD as per monitoring practice followed at site.

3 VALIDATION FINDINGS

3.1 Project Details

The project activity is renewable power generation from wind and supply of the power to the grid. The total installed capacity of the project activity is 49.5 MW equipped with 33 WTGs of 1.5 MW installed capacity each. The project is located at Jhimpir, District Thatta, Sindh, Pakistan.

Project activity is renewable energy project and applies CDM methodology ACM0002 / Version 15.0. The project activity is 49.5 MW wind power generation supplying electricity to the national grid i.e. NTDC. Hence the methodology ACM0002 is applicable for the project activity. Validation team confirmed the sectoral scope and project type which is provided on the UNFCCC website <http://cdm.unfccc.int/methodologies/PAmethodologies/approved>. The sectoral scope for the project activity is 1 (Energy industries (renewable / non renewable sources)). Since the project activity involves electricity generation through renewable source (wind), therefore, validation team confirms sectoral scope and project type mentioned in VCS-PD.

Validation team during site visit and from the review of the project approvals and generation licence confirms that the project activity is owned and operated by M/s FFC Energy Limited. Hence only FFCEL is involved as project participant in the project.

As per para 3.7.1 of VCS Standard Ver 3.4, the project start date is the date on which the project began generating GHG emission reductions or removals. Project activity achieved commercial operation date (COD) on 16/05/2013. Validation team reviewed the COD letter issued by NTDC. Hence validation team confirms the project start date as 16/05/2013.

Project participant has selected renewable crediting period with first crediting period of 10 years starting from commissioning date i.e. 16/05/2013 to 15/05/2023. Validation team confirmed the project start date as stated in above paragraph.

The section 1.7 of VCS-PD requires confirming the project scale and estimated emission reductions from the project activity. The project activity is expected to export net power of 143.6 GWh to NTDC each year and total emission reductions estimated equal to 91,085 tCO₂e per year. Hence, a total of 910,850 tCO₂e emission reductions over the 10 year crediting period. Validation team referred to the paragraph 3.9.1 of VCS standard, according to which the project will be categorised under “Project” category if it results in net reduction of estimated emissions less than or equal to 300,000 tonnes of CO₂ per year. Hence scale of the project selected by PP is under “Project” category and accepted by validation team. The emission reductions have been estimated by considering the generation and net export units specified in approved feasibility study for the project activity. The project activity is expected to generate 143.6 GWh energy to National Transmission and Despatch Company (NTDC) Grid for each year. This translates into a gross Plant load factor (PLF) of 33.12%. Hence validation team accepted the net power export figures considered for emission reduction calculation ex-ante. The emission factor is estimated ex-ante by considering the OM and BM values as per Pakistan Energy Year Books. The grid emission factor is calculated as 0.6343 tCO₂/MWh as per tool to calculate emission factor ver 4. Pakistan Energy Year Book 2013 is the latest database available for emission factor calculation

at the time of submission of project activity for validation as per emission factor tool. Therefore validation team confirms that the emission reductions estimated by the project participant is correct.

Project location is indicated by PP in section 1.9 of VCS-PD. Validation team checked the project location through independent sources and found that geographical coordinates of each WTG in the wind farm are not provided in the VCS-PD. Therefore validation team raised CL to get micro siting details. In response to CL raised, PP updated the VCS-PD section 1.9 and provided the geographical coordinates of each WTG in the wind farm. Validation team has independently checked the location of wind farm and each WTG using GPS during onsite validation visit and confirmed that geographical coordinates provided in the VCS-PD are correct.

The project activity conforms to all the applicable laws and regulations in Pakistan. Power generation using wind energy is not a legal requirement or a mandatory option. There are state and sectoral policies, framed primarily to encourage wind power projects. These policies have also been drafted realizing the extent of risks involved in the projects and to attract private investments. There is no legal requirement on the choice of a particular technology for power generation. Hence validation team conforms to the fact that project activity complies with all applicable laws, statutory and regulatory framework applicable in host country Pakistan.

The section 1.12.1 requires confirming the right of use for the project activity. Project participant provided the land documents in the favor of PP, Letter of Intent issued by Alternate Energy Development Board (AEDB) Pakistan, and Generation License issued by NEPRA which is electricity regulating authority of Pakistan. Validation team reviewed all above documents and hence all these documents confirm the right of use or ownership of project activity in the name of M/s FFC Energy Limited. Moreover validation team reviewed the letter for commercial operation of the project which is provided by the NTDC. All these documents have been issued by the competent and applicable government authorities. In addition to this, validation team also reviewed the monthly Joint Meter Readings taken by representatives of NTDC and FFCEL for sale of power as per energy purchase agreement (EPA). Based on these readings, FFCEL raises the invoice to NTDC for the power generated and sold to NTDC from the project activity. Hence it is confirmed that the right of use of the project activity lies with M/s FFC Energy Limited. This also fulfills the criteria under section 3.11.1 (3) of VCS Standard.

In sections 1.12.2, 1.12.3 and section 1.12.4 of VCS-PD, project participant confirmed that the project activity has not taken any part in other GHG programme or will not be issuing GHG credits under any other GHG programme during the crediting period. Project participant provided undertaking letter to validation team dated 09/09/2014, stating that the project activity is not registered or seeking any registration under any other GHG program except VCS program.

Section 1.13 of VCS-PD mentioned the additional information relevant to the project activity wherein project participant has confirmed that the project activity is not a grouped project and it is owned by a single project participant. Also project participant has confirmed that there is no commercially sensitive information regarding the project activity which has been excluded from the public version of project description. The project activity is applying the ACM0002 / Version 15.0 methodology as per which leakage emissions are neglected.

VCS-PD also declares that FFC Energy Limited does not have any commercial sensitive information which is to be excluded from the public version of VCS-PD. Validation team agrees with all above description and accepted the revised information provided in VCS-PD dated 22/09/2014. Therefore validation team is of the opinion that project activity fulfills the applicable VCS criteria and all requirements.

3.2 Application of Methodology

3.2.1 Title and Reference

Project activity is 49.5 MW wind power generation renewable energy project. Hence applied methodology for the project activity is ACM0002. PP has used latest available version of ACM0002 as per CDM website i.e. version 15.0.

Methodology	:	ACM0002
Version	:	15.0
Title	:	Grid-connected electricity generation from renewable sources
Sectoral Scope	:	01 – Energy industries (renewable / non renewable sources)

Methodological Tools:

“Tool for the demonstration and assessment of additionality” / Version 07.0.0

“Tool to calculate the emission factor for an electricity system” / Version 04.0

Validation team checked all specified tools above and version of the methodology to be latest available on CDM website.

3.2.2 Applicability

The proposed CDM project activity titled “49.5 MW Wind Power Project by FFCEL in Pakistan” uses an approved consolidated methodology ACM0002 / Version 15.0. The steps taken to assess the relevant information contained in the VCS-PD against each applicability condition, as stated in ACM0002 / Version 15.0, are described below.

Applicability Condition-1 (Para 3 of methodology):

This methodology is applicable to grid-connected renewable energy power generation project activities that:

- (a) *Install a Greenfield power plant;*
- (b) *Involve a capacity addition to (an) existing plant(s);*
- (c) *Involve a retrofit of (an) existing operating plants/units;*
- (d) *Involve a rehabilitation of (an) existing plant(s)/unit(s); or*
- (e) *Involve a replacement of (an) existing plant(s)/unit(s).*

The project activity is installation of a new grid connected wind power plant at a site where no renewable power plant was operated prior to the implementation of the project activity (Greenfield plant). Through physical inspection of the area, Contract with equipment suppliers, Energy Purchase Agreement with NTDC it was confirmed by validation team that project activity is a Greenfield project involving renewable energy generation for export to national grid. Hence applicability condition is met.

Applicability Condition-2 (Para 4(a) of methodology): *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.*

The proposed project activity is an installation of a new grid connected wind power plant and hence this condition is met.

Applicability Condition-3 (Para 4(b) of methodology): *In the case of capacity additions, retrofits, rehabilitations or replacements (except for wind, solar, wave or tidal power capacity addition projects the existing plant/unit 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.*

The project does not involve any capacity additions, retrofits or replacements but it is a Greenfield project involving wind energy, therefore this condition is not applicable.

Applicability Condition-4 (Para 5 of methodology):

In case of hydro power plants, one of the following conditions shall apply:

- (a) The project activity is implemented in existing single or multiple reservoirs, with no change in the volume of any of the reservoirs; or*
- (b) The project activity is implemented in existing single or multiple reservoirs, where the volume of the reservoir(s) is increased and the power density calculated using equation (3), is greater than 4 W/m²; or*
- (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; or*
- (d) The project activity is an integrated hydro power project involving multiple reservoirs, where the power density for any of the reservoirs, calculated*

using equation (3), is lower than or equal to 4 W/m², all of the following conditions shall apply:

- 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 hydro power unit which is not a part of the project activity;
- iii. Installed capacity of the power plant(s) with power density lower than or equal to 4 W/m² shall be:
 - a. Lower than or equal to 15 MW; and
 - b. Less than 10 per cent of the total installed capacity of integrated hydro power project.

The project activity is a grid connected wind power project and not a hydro power plant. Therefore, these criteria are not applicable for the project activity.

Applicability Condition-5 (Para 6 of methodology):

In the case of integrated hydro power projects, project proponent shall:

- (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 project; or*
- (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.*

The project activity is a grid connected wind power project and not a hydro power plant. Therefore, these criteria are not relevant to the project activity.

Applicability Condition-6 (Para 7 of methodology):

The methodology is not applicable to:

- (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;*

(b) *Biomass fired power plants/units.*

The project activity is a Greenfield wind farm project and doesn't involve any fossil fuel or biomass, therefore this condition is not applicable to the project activity.

Applicability Condition-7 (Para 8 of methodology): *In the case of retrofits, rehabilitations, replacements, 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".*

The project activity is a new grid connected wind power plant and not a retrofits, replacement or capacity additions and therefore this criterion is not applicable to the project activity.

Project participant has clearly demonstrated each of the applicability conditions in line with methodology ACM0002 / version 15.0.

The Validation team, based on above assessment, hereby confirms that the selected methodology ACM0002 / Version 15.0, Tool for the demonstration and assessment of additionality" / Version 07.0.0, and Tool to calculate emission factor for an electricity system, Version 04.0 is previously approved by the CDM Executive Board, and is applicable to the proposed VCS project activity, which, complies with all the relevant applicability conditions therein.

The Validation team hereby confirms that, as a result of the implementation of the project activity, there are no greenhouse gas emissions occurring within the project activity boundary, which are expected to contribute more than 1% of the overall expected average annual emissions reductions, which are not addressed by the applied methodology.

3.2.3 **Project Boundary**

The project boundary was validated as per applied methodology ACM0002 / Version 15.0 in the following manner:

The spatial extent of the project boundary includes the project wind power generation units and all power plants connected physically to grid that the project wind power generation units are connected to.

The validation team confirmed from its site visit that the project activity comprises of the same elements described in the project boundary diagram in section 2.3 of the VCS-PD.

The baseline for this project activity is the continued generation of power in fossil fuel fired power plants connected to NTDC grid. As the primary emission from such plants is CO₂, the consideration of only CO₂ gas for the baseline emissions is justified. The project activity will also import power from the grid, whenever required. Such electricity imported is accounted for

calculation of net quantity of electricity that is exported to the grid i.e. determination of the parameter $EG_{BL,y}$.

Validation team hereby confirms that the project design is sound and the geographical (Jhimpir, District Thatta) and temporal boundaries of the project are clearly defined. The validation team also confirms that the only greenhouse gas relevant to the project activity is CO_2 . This gas is addressed by the applied methodology. Based on the above assessment, the validation team hereby confirms that the identified boundary and the selected sources and gases are justified for the project activity.

3.2.4 **Baseline Scenario**

The steps taken to assess the requirement given in paragraph 3.13 of the VCS Standard are described below:

The project activity includes installation of new renewable (wind) energy generating unit, which deliver power to NTDC grid. The baseline scenario identified by the project participant is *"If the project activity is the installation of a Greenfield power plant, the baseline scenario is 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 sources, as reflected in the combined margin (CM) calculations described in the "Tool to calculate the emission factor for an electricity system".* This is in accordance with the para 21 of the applied methodology ACM0002 / Version 15.0.

Project participant has used the official published data from Pakistan Energy Year Books on operating and build margin emission factors. The edition of the data used is from Pakistan Energy Year Book 2013 published, and hence was available on the start date of validation i.e. on site visit date 06/08/2014. This data is published by Hydrocarbon Development Institute of Pakistan (HDIP), which has authority for the publication of such data in Pakistan. The project participant has applied weight factors for the OM and BM (75% & 25% respectively) as specified in the tool to arrive at the emission factor for the combined margin. The emission factor is calculated ex-ante. Accordingly, the combined margin emission factor is calculated as $0.6343 \text{ tCO}_2/\text{MWh}$.

Validation team agrees to this emission factor since it is based on the official background data published by Hydrocarbon Development Institute of Pakistan (HDIP) under Ministry of Petroleum & Natural Resources. The data published by the HDIP is an official publication of the Government of Pakistan and can definitely be regarded as a reliable and authentic source of data for the determination of grid emission factor. The validation team further notes that the emission factor is not provided by the DNA of the host party, but by a credible and competent authority of the Government of Pakistan.

It is noted that the selected baseline scenario is in line with the selected approved methodology. Validation team therefore confirms that the selected baseline scenario reasonably represents what would happen in the absence of the project activity.

Based on the above assessment, the VVB hereby confirms that:

- (a) All the assumptions and data used by the project participants are listed in the VCS-PD, including their references and sources;
- (b) All documentation used is relevant for establishing the baseline scenario and correctly quoted and interpreted in the VCS-PD;
- (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 VCS-PD;
- (e) The approved baseline methodology has been correctly applied to identify the most reasonable baseline scenario and the identified baseline scenario reasonably represents what would occur in the absence of the project activity.

3.2.5 **Additionality**

The additionality of the project has been demonstrated using approved CDM tool “Tool for the demonstration and assessment of additionality / Version 07.0.0” as referred by the applied methodology ACM0002 / Version 15.0. The VCS-PD provides step-wise approach to demonstrate and assess the additionality.

The project activity is first of its kind as assessed by application of “Guidelines on Additionality of First of Its Kind Project Activities / Version 02.0”. None of the wind power project in Pakistan started commercial operation before the project start date of FFCEL. Hence the analysis demonstrates that the proposed project activity is the first of its kind in Pakistan that applies a technology that is different from any other technologies able to deliver the same output i.e. “power” and that have started commercial operation in Pakistan (selected geographical region) before the start date of the project and project participants selected a crediting period for the project activity that is a maximum of 10 years with no option of renewal.

The validation team confirms that information provided in VCS-PD and relevant evidences provided are correct, and hence the project activity is additional.

3.2.6 **Quantification of GHG Emission Reductions and Removals**

The steps taken to assess the requirement outlined in paragraph 3.15 of the VCS Standard are described below:

The baseline emission calculation for the project activity is attributable to the CO₂ Emission that could have been produced by the fossil fuel based power plants in absence of the proposed project activity. Therefore the amount electricity supplied to the national grid will be multiplied by the grid emission factor to calculate the baseline emissions reduced by the proposed project activity.

$$BE_y = EG_{PJ,y} \times EF_{grid,CMy}$$

BE_y Baseline emissions in year y (tCO₂)

- $EG_{PJ,y}$ Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year y (MWh/yr); equal to $EG_{facility,y}$ - Quantity of net electricity generation supplied by the project to the grid in year y (MWh)
- $EF_{grid,CM,y}$ Combined margin CO₂ emissions factor in year y (tCO₂/MWh)

PP has installed back-up diesel generator to provide power supply for wind farm's auxiliary consumption in case of grid failure. It provides back-up power to UPS and its batteries, Direct Current Panel with batteries, SCADA system, VSAT power supply, Fire protection system of power transformers and MV room, security camera, offices and dormitories.

However as per para 31 of ACM0002 version 15, for all renewable energy power generation project activities, emissions due to the use of fossil fuels for the backup generator can be neglected. Hence project emission has been neglected.

$$PE_y = 0 \text{ tCO}_{2e}$$

No leakage is identified as the project is a wind project:

$$LE_y = 0 \text{ tCO}_{2e}$$

The project activity will generate GHG emission reductions by avoiding CO₂ emissions from electricity generation by fossil fuel power plants of the grid. The annual emission reductions (ER_y) are calculated as:

$$ER_y = BE_y - PE_y - LE_y$$

Where:

- ER_y Emission reductions in year y (t CO₂e/yr)
 BE_y Baseline emissions in year y (t CO₂e/yr)
 PE_y Project emissions in year y (t CO₂e/yr)
 LE_y Leakage emissions in year y (t CO₂e/yr)

$$ER_y = 91,085 - 0 - 0 = 91,085 \text{ tCO}_{2e}/\text{year}$$

Validation team assessed the calculations of estimated VCUs as provided by project participant in a spreadsheet. The assumptions in this spreadsheet were validated as follows -

Parameter, Value	Source of information	Validation justification
Net Electricity Export to Grid 143.6 GWh	As per the approved feasibility study for the project activity	The validation team accepts the estimates for the net annual electricity export to grid. As verified from the feasibility. The feasibility study is approved by AEDB.
Baseline EF,	Pakistan Energy Year	Pakistan Energy Year Books database is an

0.6343 tCO ₂ /MWh for NTDC grid	Books	official source of data and hence accepted.
---	-------	---

The estimated annual average of emission reductions of approximately 91,085 tCO₂e over the 10 year renewable crediting period of emission reductions represents a reasonable estimation using the assumptions given by the project activity.

Based on the above assessment, the VVB hereby confirms that:

(a) All assumptions and data used by the project participants are listed in the VCS-PD, 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 revised VCS-PD;

(c) All values used in the VCS-PD are considered reasonable in the context of the proposed project activity;

(d) The baseline methodology has 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 VCS-PD.

3.2.7 *Methodology Deviations*

There are no methodology deviations. All required monitoring parameters are monitored as indicated in methodology and applicable to project activity.

3.2.8 *Monitoring Plan*

The project monitors the parameters in accordance with applied methodology ACM0002 / Version 15.0. The steps taken to assess whether the monitoring arrangements described in the monitoring plan are feasible within the project design are described below:

Requirement as per the monitoring methodology	Included in the monitoring plan appropriate to type of project activity
Quantity of net electricity supplied to the grid in year y	This parameter has been included by the project participant in section 4.2 of revised VCS-PD as “EG _{PJ,y} ”. It is calculated from two parameters i.e. gross export and import from grid. Also other losses are deducted as explained in above sections. The measurement methods and procedure described are in accordance with applied methodology i.e. quantity of net electricity supplied to grid will be continuously measured by the energy meters and recorded monthly (i.e. Net export is calculated from

	measured values of “EGExport” – “EGImport”). The joint meter readings are taken for every month by representative of power purchaser (NTDC) and FFCEL based on which FFCEL raise the invoice for sale of electricity. The monitoring plan includes requirements and procedures for meter testing and calibration.
--	---

In revised VCS-PD, a cross checking mechanism for net exported power to the grid is included. PP has made provision to cross check exported power from the electricity sales invoices /receipts. Hence validation team confirms that revised VCS-PD provides the monitoring of net electricity export to grid by main and check meters. Further the cross checking mechanism will ensure the reliability of data.

The Validation team hereby confirms that the project participant is able to implement the monitoring plan in accordance with the applied monitoring methodology. The validation team also interacted with the operating team of project participant and found that they are capable of operating the wind power plant.

The validation team therefore is of the opinion that the project participant is capable of implementing the monitoring plan in the context of the project activity.

3.3 Non-Permanence Risk Analysis

Not Applicable in case of project activity.

3.4 Environmental Impact

As per Environmental Impact Assessment (EIA) Report dated January 2008, there will be no impact on the flora & fauna of the area since there is no established grazing land, national parks, protected wild life zones or bird sanctuary present near the wind farm. The site has also been examined from Noise, Shadow Flickering and Visualisation Impact Angle in the EIA report. The results show that there would be no adverse impact of Noise, Shadow Flickering and visualization on the Jhimpir dwellings. The land is also free from resettlement issues since it is the property of Government of Sindh and is allocated to Alternate energy Development Board (AEDB) for wind power generation and AEDB has leased the land to FFC Energy Limited.

The project participant has also complied with the statutory requirements in respect of obtaining the necessary clearances from the regulatory authorities. Based on the conducted EIA, the PP has also obtained environmental approval dated 07/06/2008 from Sindh Environmental Protection Agency.

The validation team has assessed that project activity does not involve any negative environmental impacts, as the equipment used for the project activity generates electricity using wind power which is one of the cleanest sources of energy.

3.5 Comments by Stakeholders

Validation team during the site visit on 06/08/2014 and 07/08/2014 interacted with some of the stakeholders who were present during actual stakeholders meeting which was carried out by FFCEL on 20/01/2009. The meeting was carried out by PP at Project site, Jhimpir, District Thatta. Announcement of the stakeholders' consultation meeting was made in the newspaper. Following stakeholders were identified by PP and invited for meeting:

1. Representatives from Government Authorities
2. Local villagers
3. Contractors
4. FFCEL employees

Validation team has checked the invitation advertisement sent to the identified stakeholders for attending the stakeholders meeting. Comments were invited from the attendees during the question and answer session and all their doubts were cleared by the team of FFCEL.

Validation team also checked the minutes of the stakeholders meeting, photos & video of stakeholder's meeting and attendance sheet wherein all stakeholders have signed providing the names, designation or occupation along with residence location.

The stakeholders consulted by validation team expressed concurrence towards setting up of the project activity and confirmed the fact that there was no major displacement of population required for implementing the project activity. It was also noted that the project activity actually involved villagers during construction activities and provided employment opportunities for both skilled and unskilled labour.

The interviewed stakeholders also mentioned that the project has generated a positive impact on the environment as it uses renewable energy for power generation. Overall, validation team could ascertain that all stakeholders were in agreement with positive impacts of project activity in surrounding area and on social well being of stakeholders within project area.

4 VALIDATION CONCLUSION

Bureau Veritas Certification has performed a validation of the "49.5 MW Wind Power Project by FFCEL in Pakistan". The validation was performed on the basis of Verified Carbon Standard VCS Version 3 criteria and also on the criteria given to provide for consistent project operations, monitoring and reporting. For validation process, validation team referred to guidelines for completing VCS PD as given in VCS-PD template version 3.2 dated 8th October 2013. Along with this the requirements of VCS Standard, version 3.4, dated 8th October 2013 and Validation and Verification Manual, ver. 3.1 dated 8th October 2013 were followed which gives guidance to validation and verification bodies for carrying out validation and verification activities.

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

The project correctly applies CDM approved consolidated methodology ACM0002 / Version 15.0 and uses the latest tool for the demonstration and assessment of the additionality. The additionality of project was demonstrated by using the latest guidelines on additionality of first of its kind project activities.

By synthetic description of the project, the project is likely to result in reductions of GHG emissions partially displacing the electricity that would have been generated using fossil fuels. The first of its kind barrier demonstrates that the proposed project activity 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 91,085 tCO₂e during the ten years of its renewable crediting period amount of emission reductions.

The review of the VCS-PD, version 1.2 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 correctly applies and meets the relevant VCS requirements and the relevant host country criteria. Bureau Veritas Certification thus requests registration of "49.5 MW Wind Power Project by FFCEL in Pakistan" as VCS project activity.



Anupam Badola

Team Leader

01/11/2014



Sanjay Patankar

Internal Technical Reviewer

01/11/2014

APPENDIX 1: VALIDATION FINDINGS (Resolution of Corrective/ Forward Actions/ Clarification Requests)

Draft report clarifications and corrective action requests by validation team	Summary of project owner response	Validation team conclusion
CAR 1 There are 33 WTGs installed in the project activity. However, unique physical identification (lat/long) of each WTGs is not available in the VCS PD.	Unique physical identification (lat/long) of each WTGs has been provided in the revised VCS PD. Supporting document: 2_micro siting details of 33 WTGs	The PP has revised the VCS PD and provided the geo-coordinates of the each WTG in meters (Easting and Northing) as per the micro-siting details. The micro-siting layout plan has also been provided to the validation team. Hence, CAR 1 has been closed by the validation team.
CAR 2 Please refer to section 1.11 of the VCS PD. The data of LOI issued by the AEDB, submitted by the PP, is 31/08/2007. The dates do not match with description provided under section 1.11.	This is a typo error. The date of LOI has been corrected in the revised VCS PD.	The PP has corrected the date of LOI in the revised VCS PD as per the LOI document submitted to the validation team. Hence, CAR 2 has been closed.

CAR 3 1. Please refer to the submitted emission factor calculation spreadsheet. The simple operating margin emission factor not calculated including imports. 2. In addition, it was noted that Option “B” has been used for the simple operating margin calculation. However, justification for not using option “A” is not clear from the VCS PD. 3. The emission reduction spreadsheet under “step analysis” spreadsheet refers to the option A under simple operating margin which is inconsistent with respect to the calculation submitted.	1. Simple operating margin has been updated with power import in the revised emission factor calculation spreadsheet. Emission from power import is not available hence it has been assumed that this is zero which is conservative. 2. Justification for using option B has been provided in the revised VCS PD. 3. Emission factor calculation spreadsheet has been updated with option B for calculation of Simple OM.	1. The PP has submitted the revised grid electricity emission factor calculation spreadsheet and considered the simple operating margin including imports. Hence, this point has been closed. 2. The justification for option B under step 4 has been provided in the revised VCS PD submitted by the PP. The revision has been accepted by the validation team based on the feedback from the local expert of the validation team. Hence, this point has been closed. 3. The PP has submitted the revised emission factor calculation spreadsheet. The description contained under the revised spreadsheet is now consistent with the computation approach followed. Hence, this point has been closed. Based on the above, the CAR 3 has been closed.
---	--	---

CAR 4 It was noted that Version 15 of the applied methodology was available after 1st June 2014. However, PDD submitted by the PP refers to an earlier version of the methodology which is not applicable for new submissions.	The version of methodology has been updated in the revised VCS PD.	The PP has revised the VCS PD as per the new methodology ACM 0002 Version 15 and referred to the same in the revised PD. Hence, CAR 4 has been closed.
CAR 5 The PP has submitted the sample copy of the Joint Monthly Meter reading Report (JMR) for the month of 02.07.2014. It was noted that electricity export and import values provided in the JMR are result of monitoring taking place at two separate lines (Nooriabad and Jhampir) by a set of main and back up energy meters. However, the energy monitoring description contained in the monitoring plan of the VCS PD submitted by the PP does not corroborate with the supporting evidence submitted.	Monitoring section 4.2 of VCS PD has been updated with information on monitoring at two places (Nooriabad and Jhampir).	The PP has revised the monitoring plan and parameters under the revised VCS PD in accordance with the project implementation. Both Nooriabad and Jhampir feeders have been discussed in monitoring plan and respective monitoring scheme has also been proposed as per the applied methodology. Hence, CAR 5 has been closed.
CAR 6 The VCS PD doesn't mention whether DNA of the host country has published any delineation of the project electricity system and connected electricity system or not. Please describe.	DNA of host country hasn't published any delineation of the project electricity system and connected electricity system. This has been provided in the VCS PD section 2.4.	The PP has provided the information and justification that host country DNA has not delineated the grid structure in Pakistan. The same was further confirmed by the local expert of the validation team. Hence, CAR 6 has been closed.

CAR 7 The capacity of the Zorlu Enerji wind farm mentioned in VCD PD §2.5 is not correct	Capacity of Zorlu Enerji wind farm has been updated to 56.4 MW.	The PP has corrected the information under revised PDD. Hence, CAR 7 has been closed.
CAR 8 In §3.2 of VCS PD, it is mentioned that there is no backup power generation, however, during onsite validation visit, backup generator was present at site. The justification/information as how back up power generation unit has been considered as per the applied methodology is missing in the VCS PD.	As per para 31 of ACM0002, version 15, for all renewable energy power generation project activities, emissions due to the use of fossil fuels for the backup generator can be neglected. Hence project emission has been neglected.	The response provided by the PP has been accepted by the validation team as the applied methodology, for renewable energy projects, allows neglecting back-up power generation facility from project emission calculations. The PP has provided justification for the same in the revised PDD. Hence, CAR 8 has been closed.
CAR 9 In §4.2 of VCS PD, 1) Calculation method for parameters $EG_{export,y}$ and $EG_{import,y}$ is not provided in the PD as there are 2 energy meters. 2) Information on data Archiving form (electronic / paper) is not available in the VCS PD.	1. Section 4.2 of VCS PD has been updated with calculation methods for parameters $EG_{export,y}$ and $EG_{import,y}$. 2. Information on data archiving in electronic and physical form has been provided in the revised VCS PD.	1. The PP has provided the calculation method for parameters $EG_{export,y}$ and $EG_{import,y}$ in the revised VCS PD submitted to the validation team. The same was found appropriate as per the physically implemented monitoring plan. 2. The information on data archiving has also been presented by the PP. The PP has provided that data would be archived electronically as well as hard copy for the crediting period +2 years. Hence, CAR 9 has been closed.

CL 1 It was also noted that LOI/Environmental clearances are issued on the name of FFCL. However, the implementing entity is FFC Energy Limited. Please clarify. It was also noted that one more LOI was issued earlier on 30/09/2005. Please provide the same.	FFCEL is subsidiary of FFCL. FFCL has acquired LOI/Environmental clearances for setting up the wind farm. These approvals/clearances were transferred to FFCEL later on after its incorporation. MoM of Board of directors meeting was shared with DOE during validation site visit.	The validation team member has reviewed the MoM of the Board of Directors meeting and convinced that approvals/clearances, being transferred to the FFECL which is a subsidiary of FFCL. CL 1 has been closed.
CL 2 Please provide supporting evidence with specific reference to the project activity for the following information provided under section 1.13 of the PD: “FFC has launched a community uplift and support program at Jhampir during 2012, focusing on villages surrounding the Wind Farm at a cost of PKR 9.4million in partnership with NORDEX” “Towers for the wind turbines were manufactured for the first time in Pakistan at Descon’s workshop in Karachi; a step towards indigenization of wind power technology in the country”	Information provided in Section 1.13 of VCS PD has been taken from following sources:- 1) Annual report of FFC http://www.ffc.com.pk/uploads/docs/ffccsr_sr_2012.pdf, Page 61 2) Descon newslatter http://www.descon.com/cms_newsletter/13/Descon_Newsletter_Final.pdf, page 8 VCS PD has been updated with these references.	1. The PP has provided the Corporate Sustainability Report (CSR) web-link of the company. The report in page no. 61 refers to the information provided under section 1.13 of the VCS PD. Hence, this point has been closed. 2. The PP has provided publicly available web-link for the document descon news winter edition 2011 which confirms that first project awarded for domestic manufacturing to Descon was from FFC Energy Limited. The web-link related to the same has also be provided by the PP in the revised VCS PD. Hence, CL 2 has been closed.

CL 3 The frequency of the calibration of main and back up energy meters is not clear from the monitoring plan of the VCS PD submitted by the PP.	The frequency of calibration has been upadated as per NEPRA grid code. Supporting document:- NEPRA grid code 2005	The calibration frequency specified for the energy meters in the revised VCS PD is at least once in two years. This is as per the applicable NERPA Grid Code 2005. The grid code also refers to the IEC Standard for testing and calibration of energy meters. Based on the iinformation provided in the VCS PD and revised of the supporting evidence submitted, the validation team closed the CL 3.
CL 4 From authorized personnel of FFCEL, please provide a declaration that project activity has not been registered or is seeking any registration under any other GHG programs.	A declaration of the same has been provided along with this submission to DOE. Supporting document:- Declaration letter from PP	A letter of declaration has been obtained by the project participant on the letter hard of the company with company seal. This was further confirmed by the local expert of the valdiation team that project is not registred or seeking any registration under any other GHG programme. Hence, CL 4 has been closed.
CL 5 The step 1 of the of the Tool to calculate emission factor for an electricity system Version 4.0 has not been justified as why the KESC and NTDC have been considered as a Project Electricity Systems.	Project activity supplies power to NTDC grid and hence the same has been now considered as Project electricity system. The emission factor calculation sheet has been updated accordingly.	The PP has revised the description in the VCS PD. The step 1 of the tool has been revised with respect to the project electricity system. In the revised description, PP has considered only NTDC as a project electricity system which is approprate considering the grid structure in Pakistan. Hence, CL 5 has been closed.

CL 6 Please provide previous versions of Pakistan Energy Yearbook referred to in the calculation of the grid emission factor as an official data published by government.	Pakistan energy book for year 2009, 2010, 2011, 2012 and 2013 are provided to DOE.	The previous versions of the Pakistan Energy Yearbook of year 2009 to 2013 have been submitted by the PP along with DVR responses. Hence, CL 6 has been closed.
CL 7 Please provide evidences that it was informed to stakeholders that project shall be developed as VCS/CDM project.	MoM of the meeting has been shared with DOE. As per the MoM it is evident that stakeholders were briefly introduced about the wind power projects being developed in Jhampir and their impact on the local environment and on the national efforts to mitigate climate change under the Kyoto Protocol. PP has shared the EIA report during stakeholder meeting (newspaper advertizement) which has reference of CER. Hence it is evident that it was informed to stakeholders that project shall be developed as VCS/CDM project.	The local expert of the validation team, who has carried out the physical site visit, and met some of the stakeholders during physical site visit, also reviewed the MoM of the stakeholder meeting which refers to the project activity being developed as a certifiable emission reduction project under the kyoto protocol climate change mechanism. Thus, it can be said that stakeholders were informed of the project being developed as VCS/CDM project. Hence, CL 7 has been closed.

APPENDIX 2: LIST OF DOCUMENTS REVIEWED

Sr. No.	Documents
/1/	VCS Project Description (VCS-PD), Version 1.2, dated 28/10/2014
/2/	Emission Reduction Calculation Sheet
/3/	Emission Factor Calculation Sheet
/4/	Pakistan Energy Yearbook 2013
/5/	Letter of Allocation of Land by Alternate Energy Development Board (AEDB), dated 07/12/2006
/6/	Letter of Intent issued by Alternate Energy Development Board (AEDB), dated 31/08/2007
/7/	Feasibility Study 50 MW FFC Wind Power Plant, Jhimpir, Pakistan, Revision 04, 21/01/2008
/8/	Letter of final approval of Feasibility Study by Alternate Energy Development Board (AEDB), dated 13/05/2010
/9/	Environmental Impact Assessment (EIA), Revision 04, 21/01/2008
/10/	Approval of EIA by Environment Protection Agency, Government of Sindh, dated 15/04/2009
/11/	Agreement for Engineering, Procurement, Supply, Construction, Erection, Installation, Commissioning, Operation, Maintenance and Services between FFC Energy Limited and Nordex Equipment Singapore (Private) Limited, dated 27/02/2010.
/12/	Generation License issued by National Electric Power Regulatory Authority (NEPRA), dated 27/08/2010.
/13/	Energy Purchase Agreement between FFC Energy Limited and National Transmission and Despatch Company (NTDC), dated 05/04/2011
/14/	Notification of Commercial Operation Date (COD) by National Transmission and Despatch Company (NTDC), dated 12/06/2013
/15/	Certificate of Compliance from Nordex Equipment Singapore (Private) Limited, dated 15/11/2012.
/16/	Letter issued by Alternate Energy Development Board (AEDB), dated 28/06/2011, Financial Closing of 49.5 MW Wind Power Project of M/S FFC Energy Limited
/17/	Tariff Determination by National Electric Power Regulatory Authority (NEPRA), dated 10/08/2010.
/18/	Certificate of Incorporation of FFC Energy Limited, dated 18/11/2009
/19/	Letter issued by Alternate Energy Development Board (AEDB), dated 19/05/2014, Registration of

FFCEL Wind Power Project for Carbon Credits – First of its kind Project	
/20/	Technical Description of Nordex S77/ 1500kW
/21/	Technical Specifications of Nordex Wind Turbines S70/ 1500kW and S77/ 1500kW
/22/	FFCEL WPP – Installation, Testing and Calibration of Metering System by National Transmission and Despatch Company (NTDC), dated 08/08/2012
/23/	Certificate of Commissioning of the Complex for 49.5 MW Wind Powered Power Generation Complex at Jhimpir of FFCEL by TUV Nord, dated 15/05/2013
/24/	Undertaking from FFC Energy Limited, dated 09/09/2014, for registration only under VCS.
/25/	Minutes of the 137 th Meeting of the Board of Directors (BOD) of FFC dated 30/07/2009.
/26/	Contract for CDM Project Development Consultancy Services, dated 10/01/2014
/27/	Daily Data Sheets (Daily Generation Reports)
/28/	Jointly Monthly Meter Reading with National Transmission and Despatch Company (NTDC), for the months of January 2014 to July 2014.
/29/	Newspaper Advertisement for Stakeholders Consultation, published in Daily Kaavish, dated 20/12/2008.
/30/	Minutes of Meeting with Stakeholders, dated 20/01/2009

APPENDIX 3: LIST OF DOCUMENTS AVAILABLE PUBLICLY

Reference	Documents
VCS Ver.3	VCS Standard dated 8 th October 2013, v3.4
VCS Ver.3	VCS Project Description Template v3.2, dtd 8 th October 2013
VCS Ver.3	Validation and Verification Manual v3.1 dated 8 th October 2013
VCS Ver.3	Registration and Issuance Process version 3.5 dated 8 th October 2013.
Meth	ACM0002 / Version 15.0 under UNFCCC CDM
Tools	Tool for the demonstration and assessment of the additionality / Version 07.0.0
	Tools to calculate emission factor for an electricity system / Version 04.0
Guidelines	Guidelines on additionality of first of its kind project activities / Version 2

APPENDIX 4: PERSONS INTERVIEWED

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

/1/	Mr. Syed Tanveer Hasan, Manager, FFC Energy Limited.
/2/	Mr. Asif Aziz, Sr. Executive, FFC Energy Limited.
/3/	Mr. Ghulam Hussain, Assistant Executive Civil, FFC Energy Limited.
/4/	Mr. Danish Ayub, DE Maintenance Mechanical, FFC Energy Limited.
/5/	Mr. Mir Dost Chang, Local Villager
/6/	Mr. A. J. Chang, Local Villager

APPENDIX 5: CURRICULA VITAE OF THE VVB'S VALIDATION TEAM MEMBERS**Mr. Anupam Badola – Team Leader****Bureau Veritas Certification (India), Lead Verifier – Climate Change**

Mr. Anupam Badola is Post Graduate in Environmental Science with five years of work experience in climate change services. He has previously worked with a manufacturing organization and a carbon advisory firm in India on CDM project development, CDM project due diligence, stack, ambient air pollution monitoring, water pollution monitoring, etc. He has undergone intensive training on Clean Development Mechanism and presently involved in the Validation and verification of CDM/VCS projects with Bureau Veritas Certification (India) Private Limited since October 2009.

Mr. Imran Altaf Bhatti – Team Member**Bureau Veritas Certification (Pakistan), Verifier - Climate Change**

Graduate in the field of Mechanical Engineering and post graduate diploma in Business Administration. Has more than 5 years of Industrial work experience and 14 years experience in the field of auditing quality, environmental and occupational health and safety management systems. Lead Auditor and Lead Trainer in Bureau Veritas Certification for Environment Management System, Quality Management System, Occupational Health and Safety Management System. Lead Auditor and Lead Trainer for Social Accountability Management System and Auditor for Energy Management System and supply Chain Security Management System. He has undergone training on Clean Development Mechanism. He is involved in the Validation of CDM projects in Pakistan.

Mr. Feroz Baig – Team Member**Bureau Veritas Certification, Verifier - Climate Change**

Graduate in the field of Electrical (Power) Engineering and Masters in Industrial Management. Has more than 6 years of experience in CDM as Consultant. Participated as an observer and trainee verifier in validation & audit of technical, financial, and legal aspects of projects involving energy efficiency in heat/power generation projects, renewable energy, and fuel switch measures. Study and review of all technical, financial, and legal compliance of wind energy projects, cogeneration and fuel switch projects in Pakistan.

Mr. Pramod Kamble**Specialist Supporting ITR, Lead Verifier – Climate Change**

He is a graduate in Chemical Engineering from Institute of Chemical Technology (ICT), Mumbai. He has prior experience of more than 5 years in climate change GHG reduction schemes such as CDM, VCS and CCX projects development, consultancy and independent third party auditing. To augment above experience he has undergone intensive training on Clean Development Mechanism and completed CDM Verifier/ Lead Verifier training course. Also he has successfully completed detailed intensive Lead Verifier training on ISO 14064:2006 and ISO 14001:2004. He has recently completed the GHG accounting assignments at Numaligarh Refinery Ltd and Mumbai International Airport. In addition, he has also conducted the ITRs for

GHG accounting projects based on ISO 14064 for GVK Industries and Surana Green Power Ltd. He has hands on experience of more than 90 mandays at site carrying out energy audits for energy industries and buildings. The energy audits were carried out in BEE identified Ceramic cluster of Morbi, Gujarat for more than 30 SMEs. Also he was part of team to carry out energy audits for 3 major government hospitals of Mumbai represented by Municipal Corporation of Greater Mumbai (MCGM). At present he is working with Bureau Veritas Certification (I) Pvt. Ltd. in climate change division and involved in the Validation/verification of more than 20 CDM and VCS projects.

Mr. Sanjay Patankar

Technical Reviewer

Product Manager – Climate Change and Sustainability Services (India)

He holds a Masters and Bachelors degree in Mechanical Engineering. He has over 20 years of experience in engineering manufacturing industry covering various functions like enterprise management, product design, engineering, tool & die design, improvements in the production shop, quality assurance & control and systems planning and implementation, including ISO 9001 based quality management systems. He is working with Bureau Veritas Certification (India) Pvt. Ltd. as Lead Auditor for the last 2 years on ISO 9001, 14001 and OHSAS 18001 standards/specifications. Has undergone training related to Clean Development Mechanism and is currently involved in validation and verification of CDM project activities.