

Project Title	Jbel Sendouq-Khalladi ("Khalladi") wind farm project in Morocco
ERM CVS Project Reference	2153.v1
Client Name	Ultimate Carbon Trading (North Africa) Limited
Client Address	1/455, Shek-O Village Road, Shek-O Hong Kong

CDM Validation Report

ERM Certification and Verification Services

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Version Control	Date
Version 1.0	24 February 2012 (draft report)
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Abbreviations

BM	Build Margin
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEF	Carbon Emission Factor
CER	Certified Emission Reduction
CH ₄	Methane
CL	Clarification request
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
COP	Conference of the Parties
DNA	Designated National Authority
FAR	Forward Action Request
DOE	Designated Operational Entity
EB	Executive Board
EIA	Environmental Impact Assessment
FSR	Feasibility Study Report
GHG	Greenhouse Gas
GSP	Global Stakeholder Process
GWP	Global Warming Potential
GWh	Giga Watt hour
IPCC	Intergovernmental Panel on Climate Change
IRR	Internal Rate of Return
LoA	Letter of approval
MOP	Meeting of the Parties
MP	Monitoring Plan
MW/MWh	Mega Watt/Mega Watt hour
NCV	Net Calorific Value
NGO	Non-Governmental Organisation
ODA	Official Development Assistance
OM	Operating Margin
PDD	Project Design Document
PPA	Power Purchase Agreement
SCE	Standard coal equivalent
UNFCCC	United Nations Framework Convention on Climate Change
VAT	Value-added tax
VVM	CDM Validation and Verification Manual

Project/Party specific abbreviations

ONEE	Office National de l'Electricité du Maroc – the Moroccan National Electricity Bureau (Also known as ONEE - <i>Office National d'Electricité et de l'Eau Potable</i>)
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1. Project Information

Key project information

Project Title	Jbel Sendouq-Khalladi ("Khalladi") wind farm project in Morocco ¹
Project Location(s)	The project is located within three rural communes of Melloussa, Qsar Sghir and Khmis Anjra, in Tangier-Tetouan Region / Fahs Anjra Province, Morocco
Host Party	Morocco
Other Party(ies)	UK
Project participants	UPC Renewables SARL Ultimate Carbon Trading (North Africa) Limited

Methodology(ies) used	ACM0002 (Version 12.3.0): Consolidated baseline and monitoring methodology for grid-connected electricity generation from renewable sources
Methodological tool(s) used	The Tool for the Demonstration and Assessment of Additionality (version 06.1.0); The Tool to Calculate the Emission Factor for an Electricity System (version 02.2.1)
Sectoral Scope(s) (as per http://cdm.unfccc.int/DOE/scopes.html)	Sectoral Scope 1 – Energy Sources (renewable/non-renewable)

Project Design Document GSP Version	Date: 06 February 2012	Project Design Document Final Version	Date: 26 December 2012
	Version Number: 1.1		Version Number: 03.4

Starting date of the project activity	01 January 2013 (predicted)
Crediting Period start and end date	01 May 2014 to 30 April 2021 (Renewable)
Estimated annual average emission reductions	143,960 tCO ₂ e

Date(s) of validation site visit	15-16 February 2012
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¹ There was a minor change to the project title between the GSP-PDD and final PDD. The final PDD, as well as other documents submitted for registration, references the project title as "Jbel Sendouq-Khalladi ("Khalladi") wind farm project in Morocco" however the GSP PDD did not include the additional quotation marks [""] within the brackets – the GSP PDD referred to the Project title as "Jbel Sendouq-Khalladi (Khalladi) wind farm project in Morocco". This is a minor change in the project title and does not have any impact on the compliance of the Project activity with the CDM rules or the determination of emission reductions.

Key technical information


Capacity of the project	120 MW
Lifetime of the project	20 years
Quantity of energy (electrical/thermal/mechanical) delivered to the end user per year (if applicable)	296,100 MWh/year
Grid to which the project is connected to (if applicable)	Moroccan National Grid

Key financial information

IRR of the project without income of CERs	7.05 %
IRR benchmark	12 %

2. Summary and Validation Opinion

Project Title	Jbel Sendouq-Khalladi ("Khalladi") wind farm project in Morocco
Name of Client	Ultimate Carbon Trading (North Africa) Limited
Basis of validation	<p>ERM CVS based its validation work on:</p> <ul style="list-style-type: none"> • CDM approved monitoring methodology(ies) ACM0002 (Version 12.3.0): Consolidated baseline and monitoring methodology for grid-connected electricity generation from renewable sources • CDM Validation and Verification Manual (version 1.2) • ERM CVS's internal CDM validation methodologies and protocols • CDM decisions and guidance issued by the CDM Executive Board • UNFCCC criteria for the Clean Development Mechanism • Host Country criteria for the Clean Development Mechanism
Responsibilities of ERM CVS	ERM CVS is responsible to provide a thorough independent third party assessment of the proposed CDM project activity to ensure that the proposed CDM project activity meets all the identified and applicable criteria for registration of projects under the CDM.
Responsibilities of Project participants	The Project Participants are responsible for preparing the PDD, supporting documentation and providing all necessary evidences to support the information included in the PDD.
Activities performed	<p>ERM CVS conducted its activities in accordance with the CDM Validation and Verification Manual. The validation consisted of a review of project documentation, a site visit, interviews with relevant personnel, cross checking information through other reliable sources and reporting. Validation work was based on a validation protocol that sets out relevant CDM requirements. Where necessary, Clarification Requests and Corrective Action Requests were raised and closed out with the Project participants. The validation work was subject to detailed Technical Review and assessment prior to submission.</p> <p>No component of the project activity was excluded from the validation.</p>
ERM CVS Conclusion	<p>ERM Certification and Verification Services (ERM CVS) has performed the validation of the project activity against the criteria for the Clean Development Mechanism as set out by the Conference of the Parties and the UNFCCC CDM Executive Board, and host country criteria. The validation employed standard auditing techniques, and addressed the requirements of the CDM Validation and Verification Manual.</p> <p>The Parties involved in the project fulfil the criteria for participation in the CDM, and have issued a letter of approval (LoA) for the project and authorised the Project participants. The LoA of the host Party confirms the contribution of the project towards sustainable development.</p> <p>The validation has provided sufficient evidence to demonstrate that the project activity is not the baseline scenario, and that emission reductions would be additional to what would have taken place in the absence of the CDM project activity.</p> <p>The project meets the applicability criteria and correctly applies methodology ACM0002 (Version 12.3.0): Consolidated baseline and monitoring methodology for grid-connected electricity generation from renewable sources, and is therefore expected to result in real, measurable and long term reductions in greenhouse gas emissions.</p> <p>The monitoring plan provides for the collection and archiving of data sufficient to ensure that emission reductions can be verified. The DNA of the host Party has confirmed that the project assists in meeting sustainable development criteria.</p> <p>Nothing came to our attention to suggest that the project activity, if implemented as described, would</p>

	<p>not result in emission reductions of 143,960 tCO₂e per year on average over the first 7 year crediting period.</p> <p>In summary, it is the opinion of ERM CVS that the Project as described in the PDD Version 03.4 of 26 December 2012, meets all stated criteria of the CDM, correctly applies the methodology, and is expected to result in real, measurable and long term emission reductions.</p> <p>ERM CVS therefore requests the CDM Executive Board approves registration of the project activity.</p>
Signed on behalf of ERM CVS	
Name:	Melanie Eddis
Date:	27 December 2012

3. Introduction

Validation Objectives

The purpose of validation is to ensure a thorough, independent assessment of proposed CDM project activities submitted for registration as a proposed CDM project activity against the applicable CDM requirements.

The DOE is responsible for reporting the results of its assessment in a validation report and submitting this validation report, along with the supporting documents to the CDM Executive Board as part of the request for registration of a project activity as a proposed CDM project activity.

The DOE also presents its opinion on the compliance of the proposed CDM project activity complies with the applicable CDM requirements, and only requests registration if this is a positive opinion.

In the course of validation, ERM CVS assesses the project's baseline, additionality demonstration, applicability to an approved CDM methodology, monitoring plan (MP), and compliance with relevant UNFCCC and host country criteria.

Validation Criteria

ERM CVS applies the following principles in performing its validation:

- Consistency
- Transparency
- Impartiality, independence and safeguarding against conflicts of interest
- Confidentiality

In all aspects of its work, ERM CVS ensures that the information and data reported are accurate, conservative, relevant, credible, reliable and complete.

Scope

The validation scope addresses the project activity as described in the Project design document (PDD) and associated documentation. The PDD and associated documentation are reviewed against the criteria and requirements stated in the CDM Validation and Verification Manual (VVM) and Article 12 of the Kyoto Protocol, the CDM modalities and procedures as agreed in the Marrakech Accords, as well as relevant decisions made by the CDM Executive Board.

The validation scope also included an assessment of completeness and accuracy of documentation, evaluation of evidences, information and assumptions made in the PDD and supporting documentation.

Contract Review

Prior to contracting with the client, a full review of the project and the validation requirements was made. This addressed both commercial risk and project risks associated with conducting the validation activities and confirmed the availability of an appropriately qualified team to conduct the validation.

Validation Personnel

Based on ERM CVS's review of the project, a validation team was established that takes into account the coverage of the technical area(s), sectoral scope(s) and relevant host country experience.

Personnel who were involved in the validation of this project activity were:

Validation Team

Name	Role	CDM Requirements	Technical area	Financial Expertise	Participated in site visit?
Jonathan Avis	Team Leader	Yes	Yes	-	Yes
Stefano Bonelli	Assessor Under Training	-	Partially Competent	-	Yes
Simon Cochrane	Financial Expert	-	-	Yes	No

DOE Head Office

Name	Role	CDM Requirements	Knowledge relevant to the technical area
Huoyun Li	Technical Reviewer	Yes	Yes

Summary of CVs of the validation personnel

Jonathan Avis is CDM Business Manager for ERM CVS, and a GHG Assessor and Technical Reviewer with over 6 years experience in the CDM. Since joining ERM CVS Jonathan has worked as a Technical Reviewer or GHG Assessor on more than 30 CDM validations in Renewable Energy (scope 1), more than 10 CDM validations in Manufacturing Industries (scope 04), 6 CDM validations in Mining (scope 8), and 5 CDM validations in Waste Handling and Disposal (scope 13). Jonathan's previous work experience involved screening and due diligence of carbon projects, Project Design Document (PDD) development, quality assurance and technical review of CDM project documentation, the development of carbon monitoring plans, and management of carbon projects through the validation, registration and verification stages. Jonathan has completed the ERM CVS CDM training as well as the GHGMI Renewable Energy training and Gold Standard training. Jonathan holds a BA in Geography and an MSc in Environmental Change and Management from the University of Oxford.

Stefano Bonelli is a GHG assessor based in Paris, France. Stefano holds a PhD in climate modelling and an MSc in environmental engineering. Dr Bonelli specialises in climate change mitigation/adaptation and sustainable development, and his project experience covers a large range of service areas: Greenhouse gas inventories; reporting and footprinting (product and corporate footprinting); corporate climate change strategy; energy efficiency; life cycle assessments; development of air pollutant calculation tools; carbon due diligence, and development of emissions reduction projects in the CDM, JI, and voluntary market). Before joining ERM, Dr. Bonelli has worked in consulting and research institutes. During his PhD at the "Commissariat à l'Energie Atomique" (French Nuclear Energy Authority), Stefano investigated the mechanisms responsible for long term climate variations and fulfilled his interest for field work by taking part in the AMOCINT oceanographic campaign. As a consultant, he worked on several carbon footprint and carbon offset projects, as well as on water and soil remediation studies.

Simon Cochrane is a CDM Financial Expert based in London, United Kingdom. Mr. Cochrane is an AAT and CIMA qualified accountant with almost 10 years' experience working in a variety of finance roles within the ERM Group, including project finance focused roles which involved liaising directly with project managers and project directors on a wide variety of environmental projects. Since November 2010, Mr. Cochrane has been working with ERM CVS specifically to audit investment analyses against the requirements of the CDM and has contributed to more than 150 validations.

Huoyun Li is a thermodynamic engineer and chartered accountant with the Association of Chartered Certified Accountants (ACCA). She has eight years work experience in the power sector in China. Since 2006 she has worked in the carbon market, with project developers and now with ERM CVS. Her previous experience in CDM includes screening and due diligence of Carbon projects, investment appraisal, internal audit and risk management of CDM projects. She has managed carbon projects through the project design document (PDD) development, validation, registration and verification stages. She also has conducted technical review of CDM documentation during validation and verification stages. The sectors she was involved in include: Catalytic reduction of N₂O in HNO₃ plants, hydroelectricity, wind energy and solar energy, landfill gas, and coal mine methane. Huoyun Li graduated from Zhejiang University in China with a degree of BSc in Engineering (major in Energy). She

also has a degree of BSc (Hons) in Applied Accounting from Brookes University, UK. Huoyun has completed the ERM CVS CDM validation and verification training course.

4. Validation Approach

The validation was carried out in accordance with the most recent version of the VVM. The validation process employed standard auditing techniques and undertook necessary cross-checks and follow-up actions to ascertain the correctness of the information. The validation team included staff with experience in the relevant technical areas within the sectoral scope, and included local host country expertise, sectoral knowledge, and financial expertise. The validation report and associated documents have undergone a thorough technical review by ERM CVS before being submitted to the CDM Executive Board for registration. The validation consisted of the following key stages:

- Upload of the PDD for Global Stakeholder Process (GSP), receipt of any comments from stakeholders
- Review of documentation including PDD, methodology and key supporting documents and references
- A visit to the project site, including interviews with personnel responsible for developing the project
- Development of a draft validation report, identifying non-compliances including Corrective Action Requests (CARs) and Clarification Requests (CLs), taking into account findings of the GSP, desk review and site visit / interviews
- Resolution of outstanding issues (CARs and CLs) and development of a final validation report and validation opinion
- Independent technical review and report approval

Global Stakeholder Process

At the start of the validation, in accordance with the latest version of the “Procedures for processing and reporting on validation CDM project activities”, the unvalidated PDD supplied by the client was uploaded on the UNFCCC website to be available for global stakeholder review. The GSP period was from 10 February 2012 to 10 March 2012.

No comments were received.

Document Review

A detailed document review of the PDD, methodology and all other associated documentation and references took place in advance of the site visit, and additional documents that were not available for the desk review were requested for review during the site visit. The document review includes:

- A review of data and information to verify the correctness, credibility and interpretation of presented information;
- Cross checks between information provided in the PDD and information from other sources, not limited to those provided by the PPs

Where the review of the PDD at the document review stage raised issues, these were further reviewed and validated through supporting documentation and cross-checking from other sources and interviewing relevant personnel involved in the project activity during the site visit. During the document review the project team also compared the proposed project activity with available information relating to projects or technologies similar to the proposed CDM project activity under validation. Where appropriate, the validation team assessed the appropriateness of formulae and the correctness of calculations presented by the PPs. A list of all documents reviewed or referred to in the course of this validation is included in Appendix A.

Site visit and Interviews

The site visit included a tour of the area where the project is planned to be constructed. The site visit also included a visit to the office of the project owner in Tangier.

Site visits and interviews provide additional and background to the project as well as cross checks with project documentation. Interviews were undertaken with relevant stakeholders in the host country, as well as personnel with knowledge of the project design and implementation. A list of interviewees, and the main topics discussed with each person can be found in appendix A.

The site visit was designed to enable the validation team to

- undertake a detailed review of additional project documentation and verify the supporting documentation;
- inspect the project site and confirm the validity of the project description in the PDD;
- assess the validity of the project boundary;
- cross-check the validity of the project information with other sources of information; and
- interview relevant stakeholders involved in the project activity as required.

Preparation of Draft Validation Report

Based on the findings of the desk review and site visit, ERM CVS prepared a draft validation report including a list of CARs and CLs, and provided this to the PPs. Where issues are identified that need to be further elaborated, researched or added to in order to confirm that the project activity meets the CDM requirements and can achieve credible emission reductions, ERM CVS identified these issues in the DVR so that they could be discussed with the PPs and concluded upon in the final validation report (FVR).

Remediation requests

Where issues were identified, ERM CVS raised one of the following remediation requests:

Clarification Request (CL): where information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met.

Corrective Action Request (CAR): where:

- Mistakes have been made that will influence the ability of the project activity to achieve real, measurable additional emission reductions;
- The CDM requirements have not been met; or
- There is a risk that emission reductions cannot be monitored or calculated.

Forward Action Requests (FAR): where it was necessary to highlight issues related to project implementation that require review during the first verification of the project activity. FARs shall not relate to the CDM requirements for registration.

CARs and CLs must be 'closed out' before the validation can be concluded. Close out is only possible where the PPs modify the project design, rectify the PDD or provide adequate additional explanation or evidence that satisfies ERM CVS's concerns. The validation process may be halted until the CARs and CLs are addressed to the validation team's satisfaction.

Final Validation Report and Validation Opinion

The final validation report (FVR) is completed when the CARs and CLs have been closed out to the satisfaction of ERM CVS. The FVR includes the validation opinion that sets out the validation conclusion regarding the compliance of the project with CDM requirements.

Internal Quality Control

The process of validation and decision of the validation team has been subject to an independent Technical Review. The scope of the Technical Review process is to independently assess that all procedures have been followed, necessary requirements have been met, and all conclusions are justified. The final validation decision is based on the findings and conclusions of the validation team, assessing the compliance of the project activity with the CDM requirements, and the technical evaluation of the independent technical reviewer. The final report is then reviewed and approved by the qualified signatory / final decision maker within ERM CVS.

5. Validation findings – Approval, Participation and Project Description

Main changes between the PDD version published for GSP and the final version submitted for registration:

- Changes related to the CARs and CLs, as identified in Appendix B
- There was a minor change to the project title between the GSP-PDD and final PDD. The final PDD, as well as other documents submitted for registration, references the project title as “Jbel Sendouq-Khalladi (“Khalladi”) wind farm project in Morocco” however the GSP PDD did not include the additional quotation marks [“] within the brackets – the GSP PDD referred to the Project title as “Jbel Sendouq-Khalladi (Khalladi) wind farm project in Morocco”. This is a minor change in the project title and does not have any impact on the compliance of the Project activity with the CDM rules or the determination of emission reductions.

Stakeholder consultation

As per VVM section D, the GSP-PDD was made publicly available for a period of 30 days from 10 February 2012 to 10 March 2012 on the UNFCCC website for the Global stakeholder process. /

<http://cdm.unfccc.int/Projects/Validation/DB/7FWGNPGCHLQ3KB8GAIZ3Q48AQDT83I/view.html/>

No comments were received.

Approval

As per VVM section E.1, ERM CVS assessed whether the DNA of each Party indicated as being involved in the project activity has provided an appropriate letter of approval (LoA).

ERM CVS has confirmed that the LoA has been issued and provides confirmation of:				
Party	Ratified Kyoto Protocol?	Voluntary Participation	Contribution to Sustainable Development	Exact project title
Morocco (Host Party)	Yes	Yes	Yes	Yes
United Kingdom of Great Britain and Northern Ireland	Yes	Yes	n/a	Yes

ERM CVS received the LoAs from the PP and the authenticity is not doubted.

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/CAR/ CL	Final OK/ NOT OK
5.3.1	Are LoAs in place for every PP that confirm <ul style="list-style-type: none"> Ratification of the Kyoto Protocol Voluntary Participation Reference to the precise project title in the PDD Contribution to sustainable development (host party only) 	<p>At the time of the draft validation report, the LoAs had not yet been provided. Please refer to CAR 1.</p> <p>CAR 1 was closed, and the LoAs were validated as follows:</p> <p>The Host Party LoA authorising UPC Renewables SARL has been provided and reviewed by ERM CVS /06/. The LoA confirms:</p> <ul style="list-style-type: none"> Ratification of the Kyoto Protocol: The Kingdom of Morocco ratified the Kyoto Protocol on 03 April 2002 	CAR-1	OK

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/CAR/ CL	Final OK/ NOT OK
		<ul style="list-style-type: none"> Voluntary Participation Reference to the precise project title in the PDD: The LoA references the project title as "Jbel Sendouq-Khalladi ("Khalladi") wind farm project in Morocco" however the GSP PDD did not include the additional quotation marks [""] within the brackets – the GSP PDD refers to the Project title as "Jbel Sendouq-Khalladi (Khalladi) wind farm project in Morocco". This is a minor change in the project title and does not have any impact on the compliance of the Project activity with the CDM rules or the determination of emission reductions. The title in the PDD and other documents (e.g. financial model) has now been updated to exactly match the title in the LoA. Contribution to sustainable development <p>The Host Party LoA was received from the project participant, but its authenticity is not doubted. The LoA does not include any additional conditions relevant to the CDM validation requirements /06/.</p> <p>During the course of the validation, the Project Participant 'Ultimate Carbon Trading (North Africa) Limited' of Morocco was replaced with 'Ultimate Carbon Trading (North Africa) Limited' in the UK – i.e. the name of entity remained the same but the Party related to this PP was changed. Therefore in the updated PDD, the Annex 1 Party, The United Kingdom of Great Britain and Northern Ireland, has been added.</p> <p>The Annex 1 LoA has been provided and reviewed by ERM CVS /07/. The LoA authorises Ultimate Carbon Trading (North Africa) Limited to participate in the project, and confirms:</p> <ul style="list-style-type: none"> Ratification of the Kyoto Protocol: the United Kingdom ratified the Kyoto Protocol on 31st May 2002 Voluntary Participation Reference to the precise project title in the PDD: The project title in the UK LoA is the same as that in the host country LoA, the MoC, and the final PDD 		
5.3.2	Is the information in the LoAs consistent with the other project documentation, including PP names, etc	Yes	CAR-1	OK

ERM CVS also reviewed whether the LoAs contain any additional specifications:

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/CAR/ CL	Final OK/ NOT OK
5.3.3	Does any LoA contain additional specification or conditions of the project activity? If so, are these conditions fully complied with?	No. Neither LoA contains any additional specifications or conditions relevant to the project activity.	CAR-1	OK
5.3.4	If the LoA references a specific version of the Validation Report and this version cannot be submitted, then has either of the following been submitted?	Neither LoA references a specific version of the validation report or PDD.	CAR-1	OK

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/CAR/ CL	Final OK/ NOT OK
	<ul style="list-style-type: none"> a statement indicating final LoA has not been received or an updated Validation Report 			
5.3.5	If the project is a bundled activity (more than 1 project in the same PDD) does the LoA from the host party acknowledge the bundle activity?	Not applicable	n/a	n/a

Conclusion

ERM CVS confirmed that LoAs have been received from all parties involved in the project.

ERM CVS's validation of the approval status of the project activity confirmed that:

- Morocco is a Party to the Kyoto Protocol
- Participation is voluntary
- The project activity contributes to the sustainable development of the host country
- The title of the project activity is identical in the LoAs and the PDD.

ERM CVS therefore confirms that the LoAs are in accordance with paragraphs 45-48 of the VVM.

Participation

As per VVM section E.2, ERM CVS evaluated whether all PPs are listed in a consistent manner in section A.3 of the PDD and have been appropriately authorised by a Party to the Kyoto Protocol. ERM CVS also checked the consistency of information between the PDD, Letters of Approval (LoAs) and the Modalities of Communication (MoC).

PPs (list all)	Is the PP listed in Section A.3 of PDD?	Are contact details given in Annex 1 of PDD?	Does the LoA name the authorised PP?	Is information in the MoC correct?
UPC Renewables SARL	Yes	Yes	Yes	Yes
Ultimate Carbon Trading (North Africa) Limited	Yes	Yes	Yes	Yes

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/CAR/ CL	Final OK/ NOT OK
5.4.1	Is the correct information provided on PPs, and consistently applied in A.3 and Annex 1 of the PDD and other project documentation (Letters	Upon resolution of CAR 1, ERM CVS confirmed that the correct information is provided on PPs, and consistently applied in A.3 and Annex 1 of the PDD and other project documentation.	CAR-1	OK

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/CAR/ CL	Final OK/ NOT OK
	of Approval and Modalities of Communication)?			
	Can it be confirmed that there are no entities other than those approved as PPs included in section A.3 or Annex 1 of the PDD.	Yes	OK	OK

Conclusion

All PPs to the project activity have been approved by a party to the Kyoto Protocol, and ERM CVS has reviewed the letters of approval to confirm this. The PPs and are listed in a consistent manner in the PDD and all related project documentation, including the LoAs and Modalities of Communication. No entities other than those approved as PPs are included in section A.3 or Annex 1 of the PDD.

Project Design Document (PDD)

As per VVM section E.3, ERM CVS reviewed the PDD to determine whether it has been prepared in accordance with the relevant template and guidance from the CDM Executive Board available on the UNFCCC website.

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/CAR/ CL	Final OK/ NOT OK
5.5.1	Is the PDD prepared in accordance with the latest forms and guidance by the CDM EB? http://cdm.unfccc.int/Reference/PDDs_Forms/PDDs/index.html	<p>ERM CVS can confirm that the PDD has been checked against the 'Guidelines for developing the Project Design Document' (version 7) and the template for the Project Design Document (version 3) available on the CDM website. Some minor issues were identified by the validation team, namely: the map legend is given in French, whereas the official language to be used in the PDD should be English; the grid coordinates were given in degrees, minutes and seconds, whereas the CDM website requires these to be inputted in digital format; the Tool to Calculate Project or Leakage CO₂ Emissions from Fossil Fuel Combustion is referenced in the PDD whereas it is not used or required for this project; the titles in the table in section B.6.4 were not exactly in line with the wording used in the PDD guidelines; and the names in the diagram of the monitoring team in section B.7.2 were not legible.</p> <p>These minor issues were addressed by the PPs by revising the PDD during the course of the validation, and the final version of the PDD is in line with the form and guidelines.</p> <p>Furthermore, certain aspects were not sufficiently described in PDD section A.4.3. (Technology to be employed by the project activity) – please refer to CL 1.</p> <p>The PDD was updated and CL 1 was closed – please refer to Appendix B. ERM CVS confirmed that the final PDD is prepared in accordance with the latest forms and guidance by the CDM EB.</p>	CL 1	OK

Conclusion

ERM CVS has confirmed that the PDD has been prepared in accordance with the latest relevant forms and guidance.

Project Description

As per VVM section E.4, ERM CVS reviewed the description of the project in the PDD in order to evaluate whether it provides a clear and accurate description of the proposed CDM project activity. Validation of the project description was based on review of documentation, a physical site inspection and interviews.

Description of the project activity

The proposed project will install 40x 3MW turbines, providing a total capacity of 120 MW. The net expected electricity generation is estimated to be 296,100 MWh/year, and will be connected to the Moroccan national grid operated by ONEE (Office National de l'Electricité du Maroc – the Moroccan National Electricity Bureau). The electricity will be wheeled via the grid to be sold to specific consumers, Holcim (a cement company) and OCP (a phosphates company).

The baseline scenario is the supply of equivalent annual power output by the national electricity grid. The baseline scenario is the same as the scenario existing prior to the start of implementation of the project activity.

The findings of our validation of the project description in the PDD are set out below.

Project Location and Status

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
5.6.1	<p>(i) Description: project design</p> <p>Does the project description in the PDD section A.4 provide a clear, accurate and sufficiently detailed description of all relevant elements of the proposed project activity?</p> <p>Specifically, does the project description provide clear indication of:</p> <ul style="list-style-type: none"> a) List of main technologies involved b) List of main equipment and installations c) The lifetime of the project equipment d) Monitoring equipment and its location e) Capacities and efficiencies f) Emissions sources and GHGs involved in the project activity g) Existing and forecast energy and mass flows and balances h) Interaction with processes/equipment outside the project boundary, if any, is stated. i) Description of technology transfer from Annex I countries (if applicable) 	<p>ERM CVS has validated the project description by means of an on site inspection, interviews with the project developer, and review of the project documentation including the EIA /03/, the equipment specifications from the turbine manufacturer VESTAS /09/, a plan of the project site and plan of the electricity connection line /02/, and the wind resource assessment/annual electricity production study /10/.</p> <p>The PDD contains a clear description of the project activity, and the nature and technical implementation of the project activity. The project description in section A.4.3 complies with the requirements of the Guidelines for completing the PDD, with the exception of the issues identified in CL 1 below. The description has been validated as follows:</p> <ul style="list-style-type: none"> a) List of main technologies involved: the key components of the project technology, i.e. the wind turbines and electricity connection lines are described, and have been confirmed against the equipment specifications from the turbine manufacturer VESTAS /09/, and plans of the project and electricity connection line /02/. b) List of main equipment and installations: specifications of the turbines and electricity connection lines are provided, and have been confirmed against the equipment specifications from the turbine manufacturer VESTAS /09/, and plans of the project and electricity connection line /02/. c) The lifetime of the project is mentioned in the PDD however the lifetime of the wind turbine equipment is not stated in section A.4.3 of the PDD – please see CL 1. <ul style="list-style-type: none"> • In response to CL 1, the lifetime of the wind turbines has been stated in the PDD section A.4.3. The lifetime is 20 years, and this has been validated against a certificate from Det Norske Veritas (DNV) certifying the technical specifications of the wind turbine /23/. d) Monitoring equipment and its location is not mentioned in section A.4.3 of the PDD – please see CL 1. <ul style="list-style-type: none"> • In response to CL 1, (b) Monitoring equipment and its location has been stated in the revised PDD section A.4.3. This has been validated to be consistent with the monitoring plan and in line with the monitoring requirements of the applied methodology. e) Capacities and efficiencies: the installed capacity of the project is stated and has been validated against the EIA /03/ and the equipment specifications from the turbine manufacturer VESTAS /09/. f) Emissions sources and GHGs involved in the project activity: section A.4.3 states that the project will reduce emissions of CO₂ associated with electricity generation in the grid. Details of the grid are provided in 	CL 1	OK

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
		<p>annex 3 of the PDD and have been validated against the official data provided by ONEE /12/13/.</p> <p>g) Existing and forecast energy and mass flows and balances: the annual electricity generation of the project is stated and has been validated against the wind resource study /10/. In the PDD the value of energy production under the probability of 90% scenario (P90) is used, and line losses of 3% are already accounted for in the value. However the line loss value is not explained explicitly in the PDD and a reference to support the value has not been provided. Please see CL 1.</p> <ul style="list-style-type: none"> In response to CL 1, a footnote has been added to the PDD to describe the expected line loss. The line loss rate cannot exceed 3%, as stipulated in the draft interconnection agreement with ONEE /24/. ERM CVS has reviewed the document and confirmed that this is an official and reputable third party source. <p>In addition, further justification for selecting the P90 scenario should be provided. Please see CL1.</p> <ul style="list-style-type: none"> In response to CL 1, ERM CVS has reviewed an official document from the International Finance Corporation that is expected to provide debt financing to the project /25/. The document is a mandate letter i.e. it is offering to provide financing to the project on the basis of an application that was submitted by the project developer. The document can therefore be considered a reliable and authoritative source. The document demonstrates that the debt financial institution, the IFC, made the decision in principle to lend to the project on the basis of the P90 (probability of 90%) scenario for electricity generation. It therefore confirms that the P90 scenario is used by the lender and is the basis of the decision to go ahead with the project, and should therefore be the basis of the financial analysis. <p>h) Interaction with processes/equipment outside the project boundary: not applicable, since the electricity grid is also included as part of the project boundary.</p> <p>i) Description of technology transfer from Annex I countries: the PDD describes that the wind turbines to be used in the proposed project activity will be supplied by the Danish manufacturer VESTAS since there are no local suppliers in Morocco. Therefore, the proposed project activity will suppose a technology transfer from an Annex I country to Morocco. This has been validated against the Turbine Supply Agreement /09/.</p>		
5.6.2	Description: Project location Is the location of the project correctly stated in the PDD? Are geographical coordinates given (in decimal format)? How has the location been validated?	Yes, the location is correctly stated in the PDD and the correct geographical coordinates are given. This information was confirmed during the site visit. However the grid coordinates given in the PDD are not in digital format. This was raised as a minor issue and was corrected by the PPs during the course of the validation.	OK	OK
5.6.3	Description: Existing installations a) If the proposed CDM project activity involves the alteration of an existing facility, installation or process, does the project description clearly state the differences resulting from the project activity compared to the pre-project situation? b) How has the description of the existing facility, installation or process	Not applicable. The project does not take place in an existing installation. The validation team confirmed that there is no existing installation at the site by means of a physical site inspection.	n/a	n/a

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
	<p>been validated?</p> <p>c) Is the description of the existing facility, installation or process consistent with information provided in other parts of the PDD such as common practice and baseline selection?</p>			
5.6.4	<p>Description: Operational lifetime</p> <p>a) Does the PDD state the operation start date of the project? How was this validated? If the project is being implemented in phases, is this clearly described in the PDD?</p> <p>b) What is the expected operational lifetime of the project activity? Is this lifetime considered reasonable for a project of this type in the host country?</p>	<p>The project has not yet started construction. This was confirmed by means of a physical site inspection. Based on interviews during the site visit, the expected operation start date of the project was 01 January 2014, which was consistent with the start date of the crediting period stated in the GSP PDD. However during the course of validation, the project was delayed and the expected operation start date of the project is now April 2014. This has been updated in the revised PDD.</p> <p>The project is not being implemented in phases.</p> <p>The expected operational lifetime of the project activity is 20 years. This is considered reasonable for a wind project based on ERM CVS's sectoral knowledge. However confirmation of the lifetime of the equipment as stated by the manufacturer has not been provided – please see CL 1.</p> <p>The lifetime of the equipment has now been validated against a certificate from Det Norske Veritas (DNV) certifying the technical specifications of the wind turbine /23/, and CL 1 was closed.</p>	CL-1	OK
5.6.5	<p>Is information on the plant load factor provided in the PDD? How has this been validated (please refer to the Guidelines for the reporting and validation of plant load factors, EB41_Annex 12.</p>	<p>The estimated net electricity generation is stated in the PDD however the reference to support this value has not been provided. Please see CL 1.</p> <p>The estimated net electricity generation of the project has been revised based on an updated and more accurate assessment of the electricity generation by the proposed project. ERM CVS confirmed the value by validating the wind assessment report prepared by Garrad Hassan France SARL 'Assessment of the energy production of the proposed El Khalladi Wind Farm in the Kingdom of Morocco' /39/, which was prepared for the lender, International Finance Corporation, and can therefore be considered a reliable and authoritative document. The report was based on 30 months of on site wind speed measurements, and long term meteorological data from several meteorological stations in the vicinity of the site. Meteorological stations at Tarifa, Ceuta and Tanger airport were assessed and the historical data and the measurement equipment used at these stations was evaluated to determine the time period of data that is consistent and reliable. The most reliable data was found to be from Tanger airport, and the report used the most recent 11 years of data from this station (changes in the way the data was monitored in 2001 made earlier data not exactly comparable). The load factor of the project was therefore determined in a rigorous and conservative manner, by an independent third party contracted by the PPs, and was therefore found to be in line with the 'Guidelines for the reporting and validation of plant load factors' version 01 (EB 48, Annex 11).</p> <p>In order to cross check the value, ERM CVS has reviewed an official document from the International Finance Corporation that is expected to provide debt financing to the project /25/. The document is a mandate letter i.e. it is offering to provide financing to the project on the basis of an application that was submitted by the project developer. The document can therefore be considered a reliable and authoritative source. The document confirms the expected net electricity generation of the project, which is consistent with the value used in the investment analysis, and demonstrates that the debt financial institution, the IFC, made the decision in principle to lend to the project on the basis of the P90 (probability of 90%) scenario for electricity generation. It therefore confirms that the P90 scenario is used by the lender and is the basis of the decision to go ahead with the project, and should therefore be the basis of the financial analysis.</p>	CL-1	OK

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
		CL 1 was therefore closed.		

Conclusion

The process undertaken to validate the accuracy and completeness of the project description is set out in detail above. ERM CVS has confirmed that the project description in the PDD provides a clear, accurate and complete understanding of the nature of the proposed CDM project activity.

Description of baseline scenario

The project description was evaluated to confirm whether or not it provides a clear and accurate summary of the project and baseline scenario.

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
5.6.6	Is there a clear description of the baseline scenario in the PDD? This should include: a) A list of the equipment(s) and systems that would have been in place in the absence of the project activity (if any) b) Information about the age and average lifetime of the baseline facility based on manufacturer's specifications and industry standards (if applicable) c) Installed capacities, load factors and efficiencies of the baseline facility (if applicable) d) An explanation of how the same types and levels of services provided by the project activity would have been provided in the baseline scenario.	The PDD includes a description of the baseline, which is defined in the methodology ACM0002 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 sources" as reflected in the combined margin ("CM") calculations according to the "Tool to calculate the emission factor for an electricity system". Details of the grid are provided in Annex 3 of the PDD, and have been validated against the data provided by ONEE on the electricity grid (letter from ONEE dated 13 January 2012 and complementary letter dated 16 February 2012) /12/13/. There is no baseline facility as the project is a Greenfield project. The PDD explains that in the absence of the project electricity would have been supplied by the existing generation mix operating in the grid. This is in line with the baseline as defined by the methodology.	OK	OK
	If the scenario existing prior to the start of the implementation of the project activity is different from the selected baseline scenario, is there a clear description of the pre-existing scenario, with a list of the equipment(s) and systems in operation at that time?	Not applicable. The scenario existing prior to the start of the implementation of the project activity is the same as the selected baseline scenario.	OK	OK

Conclusion

The project description in the PDD contains a clear description of the project activity that provides the reader with a clear understanding of the precise nature of the project activity and the technical aspects of its implementation. The description sufficiently covers all relevant elements, is accurate, and clearly states the differences resulting from the project activity compared to the pre-project situation.

6. Validation findings – Baseline and Monitoring Methodology

ERM CVS has evaluated the baseline and monitoring methodology selected by the PPs to confirm its applicability and whether or not it has been appropriately applied to the project activity.

Validity of selected methodology and methodological tools

As per VVM section 5a, ERM CVS validated that an approved and currently valid baseline and monitoring methodology (and associated methodological tools) have been applied for this proposed CDM project activity.

Baseline methodology applied	ACM0002 (Version 12.3.0): Consolidated baseline and monitoring methodology for grid-connected electricity generation from renewable sources
Methodological tools applied as required by the methodology	The Tool for the Demonstration and Assessment of Additionality (version 06.1.0); The Tool to Calculate the Emission Factor for an Electricity System (version 02.2.1)

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
6.1.1	Are the number, title and version of the approved methodology clearly and correctly stated? Is the methodology within its period of validity?	ERM CVS has determined that the methodology is correctly quoted and applied by comparing with the actual text of the applicable version of the methodology available on the UNFCCC CDM website. The methodology is within its period of validity.	OK	OK
	Are all the required tools applied and fully referenced in the PDD? Are the version numbers applicable at the time of validation?	ERM CVS has determined that the methodological tools are correctly quoted and applied by comparing with the actual text of the applicable version of the tools available on the UNFCCC CDM website. The tools are within their period of validity.	OK	OK
	If applicable, has any specific guidance provided by the CDM EB relating to the applied methodology been considered?	Yes. The following EB guidance have been considered: Guidelines on the demonstration and assessment or prior consideration of the CDM, EB 62, Annex 13; Guidance on the Assessment of Investment Analysis, EB 62, Annex 5; Guidance for the reporting and validation of plant load factors (version 01), EB 48 Annex 11;	OK	OK

Conclusion

The applied methodology and associated methodological tools have been correctly described and are approved by the CDM Executive Board. All versions are currently valid.

Applicability of the selected methodology to the project activity

As per VVM section 5b, ERM CVS evaluated whether the selected baseline and monitoring methodology applied is applicable to the project activity. This evaluation was based on a review of the PDD and associated documentation and a visit to the project site. ERM CVS has validated that the applicability conditions of the methodology (and tools, where relevant) are met and that the project activity is not expected to result in emissions other than those allowed by the methodology.

ERM CVS has assured the compliance of the project activity with each of the applicability conditions of the selected methodology and tools:

	Applicability Conditions in methodology and/or tools	Discussed in PDD (yes/no)	Applicable (Yes/No, or state that this condition is not relevant for the project)	Validation findings (including justification and substantiation of information, data and evidence).	Draft OK/ CAR/CL	Final OK/ Not OK
6.2.1	This methodology is applicable to grid-connected renewable power generation project activities that (a) install a new power plant at a site where no renewable power plant was operated prior to the implementation of the project activity (greenfield plant); (b) involve a capacity addition; (c) involve a retrofit of (an) existing plant(s); or (d) involve a replacement of (an) existing plant(s).	Yes	Yes	This applicability condition was able to be validated on site. ERM CVS has confirmed by visual inspection that the project is a newly built grid connected wind power plant. No renewable power plant was operated at the site prior to the implementation of the project activity. This was confirmed by review of a list of all existing power plants in the country provided by ONEE /12/ and by the site inspection.	OK	OK
	The project activity is the installation, capacity addition, retrofit or replacement of a power plant/unit of one of the following types: hydro power plant/unit (either with a run-of-river reservoir or an accumulation reservoir), wind power plant/unit, geothermal power plant/unit, solar power plant/unit, wave power plant/unit or tidal power plant/unit;	Yes	Yes	The project is a newly installed wind project.	OK	OK
	In the case of capacity additions, retrofits or replacements: 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 or retrofit of the plant has been undertaken between the start of this minimum historical reference period and the implementation of the project activity;	Yes	Not relevant	The project is a Greenfield project, not a capacity addition, retrofit or replacement. This has been confirmed by means of a site inspection.	OK	OK
	In case of hydro power plants: • One of the following conditions must apply: o The project activity is implemented in an existing single or multiple reservoirs,	Yes	Not relevant	The project is a wind farm project.	OK	OK

	Applicability Conditions in methodology and/or tools	Discussed in PDD (yes/no)	Applicable (Yes/No, or state that this condition is not relevant for the project)	Validation findings (including justification and substantiation of information, data and evidence).	Draft OK/ CAR/CL	Final OK/ Not OK
	<p>with no change in the volume of any of reservoirs; or</p> <p>o The project activity is implemented in an existing single or multiple reservoirs, where the volume of any of reservoirs is increased and the power density of each reservoir, as per the definitions given in the Project Emissions section, is greater than 4 W/m²; or</p> <p>o The project activity results in new single or multiple reservoirs and the power density of each reservoir, as per the definitions given in the Project Emissions section, is greater than 4 W/m².</p>					
	<p>In case of hydro power plants using multiple reservoirs where the power density of any of the reservoirs is lower than 4 W/m² all the following conditions must apply:</p> <ul style="list-style-type: none"> The power density calculated for the entire project activity using equation 5 is greater than 4 W/m²; Multiple reservoirs and hydro power plants located at the same river and where are designed together to function as an integrated project that collectively constitute the generation capacity of the combined power plant; Water flow between multiple reservoirs is not used by any other hydropower unit which is not a part of the project activity; Total installed capacity of the power units, which are driven using water from the reservoirs with power density lower than 4 W/m², is lower than 15MW; Total installed capacity of the power units, 	Yes	Not relevant	The project is a wind farm project.	OK	OK

	Applicability Conditions in methodology and/or tools	Discussed in PDD (yes/no)	Applicable (Yes/No, or state that this condition is not relevant for the project)	Validation findings (including justification and substantiation of information, data and evidence).	Draft OK/ CAR/CL	Final OK/ Not OK
	which are driven using water from reservoirs with power density lower than 4 W/m ² , is less than 10% of the total installed capacity of the project activity from multiple reservoirs.					
	In the case of retrofits, 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, i.e. 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".	Yes	Not relevant	The project is a greenfield project.	OK	OK
	<p>The methodology is not applicable to the following:</p> <ul style="list-style-type: none"> • 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; • Biomass fired power plants; • Hydro power plant that result in a new single reservoir or in the increase in existing single reservoir where the power density of the power plant is less than 4 W/m². 	Yes	Not relevant	The project is a wind farm and does not involve switching from fossil fuels to renewable energy sources at the site. This was confirmed by a site inspection.	OK	OK

	Question	Validation findings (including justification and substantiation of information, data and evidence).	Draft OK/ CAR/CL	Final OK/ Not OK
6.2.2	Has any source of GHG emission been identified within the project boundary that is expected to contribute more than 1% of the project activity's expected average annual emissions reductions, and which is not addressed by	ERM CVS has determined that there will be no other GHG emissions within the project boundary expected to contribute more than 1% of the predicted emission reductions, which are not addressed by the applied methodology. This was confirmed by assessment of the project on site and by review of the project design, as described in section 5.6 above.	OK	OK

	Question	Validation findings (including justification and substantiation of information, data and evidence).	Draft OK/ CAR/CL	Final OK/ Not OK
	the applied methodology?			

Conclusion

The applied methodology and associated tools are fully applicable to the project activity and is correctly applied in the PDD. There are no greenhouse gas emissions occurring within the proposed CDM project activity boundary as a result of the implementation of the proposed CDM project activity which are expected to contribute more than 1% of the overall expected average annual emissions reductions, which are not addressed by the applied methodology, were identified.

Project Boundary

As per VVM section 5.c, ERM CVS reviewed the description of the project boundary in the PDD, including the physical delineation of the proposed CDM project activity included within the project boundary for the purpose of calculating project and baseline emissions for the proposed CDM project activity.

According to the applied methodology, the spatial extent of the project boundary includes the project power plant and all power plants connected physically to the electricity system (grid) that the CDM project power plant is connected to.

Emission sources

The emissions sources included in or excluded from the project boundary, as set out in the applied methodology are as follows:

	Source	Gas	Included in PDD?	Is inclusion / exclusion justified in the PDD?	How has this been validated?
Baseline emissions	CO2 emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity	CO ₂	Yes	Yes	This is a major emissions source according to the methodology.
Project emissions	None	-	-	-	According to the methodology there are no project emissions associated with wind farm projects
Leakage emissions	None	-	-	-	According to the methodology there are no leakage emissions associated with wind farm projects

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
6.3.1	Has the PDD justified the inclusion/exclusion of all potential sources of GHG emissions as set out in the applied baseline methodology	ERM CVS confirms, based on review of the PDD and the methodology, that the sources of GHG emission set out in the applied methodology were correctly included in the project boundary.	OK	OK

Conclusion

The identified boundary and the selected sources and gases included in the final PDD are appropriately described and justified for the project activity, in accordance with the applied methodology. The information is correctly described in the section B.3 of the PDD.

Physical delineation of the project

ERM CVS evaluated whether the PDD correctly describes the physical delineation of the proposed CDM project activity, including which installations/processes are included within the geographical boundary of the project activity.

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
6.3.2	Does the PDD correctly describe the project boundary, including the physical delineation of the proposed CDM project activity included within the project boundary?	Based on the site visit and review of the technical documentation associated with the project /09/10/12/, ERM CVS confirmed that the PDD correctly describes which installations/processes are included within the geographical boundary of the project activity. A diagram is included in the PDD that correctly illustrates the project boundary, including all the key equipment, systems and flows of mass and energy, as well as the emissions sources and gases included in the project boundary.	OK	OK
	Were any emission sources identified that will be affected by the project activity and are not addressed by the selected approved methodology? If so, was clarification of, revision to or deviation from the methodology approved in accordance with required procedures.	No emissions sources other than those addressed by the methodology were identified.	OK	OK

Conclusion

The PDD correctly describes the project boundary, including the physical delineation of the proposed CDM project activity, in compliance with the requirements of the selected baseline methodology, and this is consistent with site observations and other documentation provided. All sources and GHGs required by the methodology have been included within the project boundary. Where the methodology allows PPs to choose whether a source or gas is to be included within the project boundary, the PPs have sufficiently justified that choice. The justifications provided are reasonable, based on assessment of supporting documented evidence /09/10/12/ and site observations. The project boundary is justified for the project activity, based on ERM CVS's local and sectoral knowledge.

Baseline identification

As per VVM section 5d, ERM CVS reviewed the PDD to assess whether it correctly identifies the baseline for the proposed CDM project activity, defined as the scenario that reasonably represents the anthropogenic emissions by sources of GHGs that would occur in the absence of the proposed CDM project activity.

As per VVM paragraph 105, no alternative analysis is required if the approved methodology that is selected by the proposed CDM project activity prescribes the baseline scenario.

The baseline identification has been validated as follows:

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
6.4.1	Does the PDD identify the baseline, a scenario that represents the anthropogenic	Yes. The PDD clearly identifies the baseline scenario as: electricity delivered to the grid by the project activity that would have otherwise been generated by the existing grid-connected power plant and the addition of new power sources, as	OK	OK

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
	emissions by sources of GHG that would occur in the absence of the proposed CDM project activity?	reflected in the combined margin. This is in line with the methodology.		
	Have the procedures/ steps to identify the most reasonable baseline scenario, as required by the methodology and applicable tools, been documented clearly in the PDD?	Since the baseline is specified by the methodology, no further procedures / steps to identify the most reasonable baseline scenario are required	OK	OK
	Are all feasible and credible alternatives identified including but not limited to all the potential scenarios listed in the methodology? Does the list of alternatives include the project activity undertaken without being registered as a CDM project?	Since the baseline is specified by the methodology, no further procedures / steps to identify the most reasonable baseline scenario are required	OK	OK
	Are realistic different configurations or combinations of alternatives that may be able to provide similar outputs and services considered?	Since the baseline is specified by the methodology, no further procedures / steps to identify the most reasonable baseline scenario are required	OK	OK
	Are all considered alternatives assessed for consistency with (enforced) mandatory laws and regulations?	Since the baseline is specified by the methodology, no further procedures / steps to identify the most reasonable baseline scenario are required	OK	OK
	Have all relevant national and/or sectoral policies and circumstances been taken into account? Are they identified and correctly considered in the PDD?	<p>Based on ERM CVS's local and sectoral knowledge, the validation team can confirm that the selected baseline is in line with all relevant national and sectoral policies and circumstances. The regulatory framework is also described in the PDD section A.2. The proposed project is developed in the context of Law 13.09 /15/, which was adopted in March 2010 to promote large scale renewable electricity generation projects by offering the possibility for private operators to produce electricity from renewable resources and to sell the generated electricity to a pool of clients. This law was adopted to set a framework to authorise and enable renewable energy projects but does not impose mandatory regulations requiring private investors to build such projects, nor does it provide additional subsidies or financial incentives for the construction of the proposed project.</p> <p>ERM CVS has undertaken a review of host country policies and regulations regarding renewable energy. Historically there has been limited development of renewable energy in Morocco, but in recent years the government has been taking steps to deregulate the electricity market and open it up for participation by private entities investing in renewable energy projects /17/18/19/. ONEE also has a \$3.4 billion development plan designed to promote rural electrification and renewable energy development /17/ however to date most investments have been tied to CDM financing /21/. The Moroccan government has undertaken a long term project with GTZ to create an enabling regulatory framework for renewable energy, which led to the adoption of law 13.09 /19/. Law 13.09 breaks ONEE's monopoly on electricity generation and also regulates the approval process for renewable energy projects – requiring for example that all projects</p>	OK	OK

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
		larger than 2MW require full authorisation /18/. The Government also established the "National Agency for the Development of Renewable Energies and Energy Efficiency" /18/. All of these measures created an environment where renewable energy could be legally developed and regulated, however no subsidies or financial incentives were identified that could apply to the proposed project, and based on the regulatory review, the baseline is confirmed to be in compliance with relevant national and sectoral policies and circumstances /15/16/17/18/19/.		

Conclusion

Based on the site visit and documentary evidence to cross check the information contained in the PDD as referenced above, ERM CVS confirms that that:

- All the assumptions and data used by the PPs in establishing the baseline scenario are listed in the PDD, including their references and sources;
- All documentation used is relevant for establishing the baseline scenario and correctly quoted and interpreted in the PDD;
- Assumptions and data used in the identification of the baseline scenario are justified appropriately, supported by evidence and can be deemed reasonable;
- Relevant national and/or sectoral policies and circumstances are considered and listed in the PDD;
- 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 proposed CDM project activity.

Algorithms and/or formulae used to determine emission reductions

As per VVM section 5e, ERM CVS has evaluated whether the steps taken and equations applied to calculate project emissions, baseline emissions, leakage and emission reductions comply with the requirements of the selected baseline and monitoring methodology.

ERM CVS conducted validation activities to determine whether the equations and parameters in the PDD have been correctly applied by comparing them to those in the selected approved methodology. Where the methodology provides for selection between different options for equations or parameters, ERM CVS confirmed that adequate justification has been provided (based on the choice of the baseline scenario, context of the proposed CDM project activity and other evidence provided) and that the correct equations and parameters have been used, in accordance with the methodology selected.

ERM CVS verified the justification given in the PDD for the choice of data and parameters used in the equations. Where data and parameters will not be monitored throughout the crediting period of the proposed CDM project activity but have already been determined and will remain fixed throughout the crediting period (ex-ante parameters), ERM CVS assessed that all data sources and assumptions are appropriate and calculations are correct, applicable to the proposed CDM project activity and will result in a conservative estimate of the emission reductions. Where data and parameters will be monitored on implementation and hence become available only after validation of the project activity, ERM CVS confirmed that the estimates provided in the PDD for these data and parameters are reasonable (please see section 8 for details of the validation of the monitored parameters).

Ex Ante Data and Parameters

Each parameter required by the methodology and tools for this project type is listed and validated in detail as follows:

Parameter required as per methodology / tools	Description of the parameter (as per methodology)	Is the parameter included in the PDD?	Title and description in the PDD line with the Methodology?	Data unit correctly expressed in PDD?	Value in PDD correct and provides for conservative estimate of Emission Reductions? How was this validated?	Measurement method correctly described in the PDD (if applicable)
FCI _{m,y}	Amount of fossil fuel type i consumed by power plant / unit m feeding the grid, in year y	Yes	Yes	Yes	Yes. This was confirmed by review of the official data provided by ONEE /12/13/.	Not applicable
EG _{m,y}	Net electricity generated by power plant/unit m in year y	Yes	Yes	Yes	Yes. This was confirmed by review of the official data provided by ONEE /12/13/.	Not applicable
NCV _i	Net calorific value (energy content) of fossil fuel type I in year y	Yes	The parameter is described as "Net calorific value (energy content) per mass or volume unit of fuel i" – the meaning is clear and in line with the methodology.	Yes	Yes. This was confirmed by review of the official data provided by ONEE /12/13/.	Not applicable
EF _{CO₂,i}	CO ₂ emission factor of fossil fuel type i used in power unit m in year y	Yes	The parameter is described as "Carbon emission factor per unit of energy of the fuel I" – the meaning is clear and in line with the methodology.	Yes	The data was confirmed by review of the official data provided by ONEE /12/13/. However the unit is described as tCO ₂ /TJ whereas it is described as tCO ₂ /GJ in the tool. This was raised as a minor issue and corrected by the PP during the course of the validation.	Not applicable

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
6.5.1	Have the parameters required by the methodology / tools been correctly described in the PDD? Where the methodology provides for selection between different options for data and parameters; is the choice of data and parameters justified?	The parameters required by the methodology and tools have been correctly described in the PDD and the choice of data and parameters is correctly justified. For further details please see the table above.	OK	OK

Equations and calculations used to calculate emission reductions

ERM CVS reviewed the PDD to assess whether the equations and calculations used to calculate emission reductions are correctly applied, in accordance with the methodology ACM0002 and the Tool to Calculate the Emission Factor for an Electricity System (version 02.2.1).

The following steps are applied in the PDD to determine emission reductions:

Baseline emissions

In accordance with the ACM0002, the baseline scenario is defined as the “*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”.*”

The PP has assessed baseline emissions in accordance with the Tool to Calculate the Emission Factor for an Electricity System (version 02.2.1). The following six steps have been applied:

STEP 1. Identify the relevant electricity systems.

The relevant electricity system is well identified and corresponds to the national grid, which is defined by the Office National d'Electricité (ONEE) /12/13/. For the purpose of determining the operating margin emission factor, the CO₂ emission factor for net electricity imports from a connected electricity system are considered equal to 0 tCO₂/MWh, which is in line with the tool. Electricity exports were not subtracted from electricity generation data used for calculating and monitoring the electricity emission factors.

STEP 2. Choose whether to include off-grid power plants in the project electricity system (optional).

Option I was chosen, and only grid power plants are included in the calculation.

STEP 3. Select a method to determine the operating margin (OM).

Option (a) (simple OM) was chosen. Low-cost/must-run sources for Morocco constitute less than 50% of total generated electricity in the average of the five most recent years, and ERM CVS has validated the relevant evidence sources /12/13/. The ex ante option was chosen, therefore the emission factor is determined once at the validation stage, thus no monitoring and recalculation of the emissions factor during the crediting period is required. For grid power plants, the PP has used a 3-year generation-weighted average, based on the most recent data available at the time of submission of the CDM-PDD for validation /12/13/.

STEP 4. Calculate the operating margin emission factor according to the selected method.

The simple OM is calculated as the generation-weighted emissions per electricity unit of all generating units serving the system, excluding low cost and must-run power plants. Option A (based on the net electricity generation and a CO₂ emission factor of each power unit) was chosen, and the OM is calculated on the basis of average efficiency and electricity generation of each plant using data for the years 2008, 2009 and 2010 /12/13/, using equation 1 of the tool:

$$EF_{grid,OMsimple,y} = \frac{\sum_m EG_{m,y} \cdot EF_{EL,m,y}}{\sum_m EG_{m,y}}$$

Where:

- $EF_{grid,OMsimple,y}$ = Simple operating margin CO₂ emission factor in year y (tCO₂/MWh)
- $EG_{m,y}$ = Net quantity of electricity generated and delivered to the grid by power unit m in year y (MWh)
- $EF_{EL,m,y}$ = CO₂ emission factor of power unit m in year y (tCO₂/MWh)
- m = All power units serving the grid in year y except low-cost / must-run power units
- y = The three most recent years for which data is available at the time of submission of the CDM-PDD to the DOE for validation (ex ante option).

$EF_{EL,m,y}$ is determined using option A1 of the Tool to Calculate the Emission Factor for an Electricity System, since data on fuel consumption and electricity generation is available, using equation 2 of the tool:

$$EF_{EL,m,y} = \frac{\sum_i FC_{i,m,y} \cdot NCV_{i,y} \cdot EF_{CO_2,i,y}}{EG_{m,y}}$$

Where

- $FC_{i,m,y}$ = Amount of fossil fuel type i consumed by power plant / unit m in year y (mass or volume unit)
- $NCV_{i,y}$ = Net calorific value (energy content) of fossil fuel type i in year y (GJ / mass or volume unit)
- $EF_{CO_2,i,y}$ = CO₂ emission factor of fossil fuel type i in year y (tCO₂/GJ)
- i = All fossil fuel types combusted in power plant / unit m in year y
- m = All power units serving the grid in year y except low-cost/must-run power units
- y = The relevant year as per the data vintage chosen in Step 3

The simple OM was calculated using the data of all operational power fossil fuel fired plants providing electricity to the grid for the years 2008, 2009 and 2010, and ERM CVS has cross checked the data used in the calculations against the official data provided by ONEE /12/13/. The OM is confirmed as 0.6059 tCO₂/MWh.

STEP 5. Calculate the build margin (BM) emission factor.

In terms of vintage of data, the project participants have chosen Option 1: For the first crediting period, calculate the build margin emission factor ex ante based on the most recent information available on units already built for sample group m at the time of CDM-PDD submission to the DOE for validation.

The BM was calculated on the basis of the set of power capacity additions in the electricity system that comprises at least 20% of the system generation in 2010. The BM was determined as per the procedures (a) to (f) in the tool. The sample group of power units ' m ' used to calculate the build margin is the SETsample-CDM->10yrs. This set includes the thirteen most recent power units, including two power plants registered as CDM projects, and ERM CVS has validated the calculations against the official grid data /12/13/.

The Build Margin emissions factor (BM) was calculated as the generation-weighted average emission factor of the most recently built plants, following equation 12 of the tool:

Where

- $EF_{grid,BM,y}$ = Build margin CO₂ emission factor in year y (tCO₂/MWh)
- $EG_{m,y}$ = Net quantity of electricity generated and delivered to the grid by power unit m in year y (MWh)
- $EF_{EL,m,y}$ = CO₂ emission factor of power unit m in year y (tCO₂/MWh)
- m = Power units included in the build margin
- y = Most recent historical year for which power generation data is available

The CO₂ emission factor of each power unit ' m ' ($EF_{EL,m,y}$) was determined as per the guidance in Step 4 (a) for the simple OM, using option A2, using for y the most recent historical year for which electricity generation data is available, and using for ' m ' the power units included in the build margin. Since the power units included in the build margin m correspond to the sample group SETsample-CDM->10yrs, in line with the tool option A2 from guidance in Step 4 (a) was used and the default values provided in Annex 1 of the tool were used to determine the parameter $\eta_{m,y}$. The BM was confirmed as 0.1271 tCO₂/MWh.

STEP 6. Calculate the combined margin (CM) emission factor.

The CM was calculated as the weighted average of the emissions factor of the OM and the BM (Option A; preferred option), using default values for wind and solar power generation project activities. $w_{OM} = 0.75$ and $w_{BM} = 0.25$. The Combined Margin emissions factor was confirmed as 0.4862 tCO₂/MWh.

ERM CVS conducted validation activities to determine whether the equations and parameters in the PDD have been correctly applied by comparing them to those in the selected approved methodology and associated tool. Where the methodology provides for selection between different options for equations or parameters, ERM CVS confirmed that adequate justification has been provided (based on the choice of the baseline scenario, context of the proposed CDM project activity and other evidence provided) and that the correct equations and parameters have been used, in accordance with the methodology selected.

Project emissions

Project emissions are equal to 0 (zero) for the proposed project activity. Justification for this choice is provided in the PDD, as the project activity doesn't involve any use of fossil fuels, neither geothermal nor hydro energy sources.

Leakage

Leakage emissions are equal to 0 (zero) for the proposed project activity. Justification for this choice is provided in the PDD.

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
6.5.2	Has the PP correctly applied all relevant calculations as required by the methodology and associated tools? Is it fully explained how the procedures provided in the Methodology and applicable Tools are applied by the proposed project activity? (i.e. Are the required steps clearly followed?)	Yes. All relevant calculations and procedures provided in the Methodology and associated Tools are correctly applied by the PP and clearly described in the PDD. The calculations are correctly applied in the ER spreadsheet /5/.	OK	OK
	Where the methodology provides for selection between different options for equations; is every choice of options for calculating project emissions, baseline emissions and leakage offered by the methodology correctly justified in the context of the project activity and baseline scenario?	Yes. All methodological options are correctly described and justified in the PDD both in the context of project activity and baseline scenario.	OK	OK
	Are the formulae required for the determination of project emissions, baseline emissions and leakage correctly presented in a complete and transparent manner, enabling a complete identification of parameters to be used and / or monitored?	Yes. The formulae required for the determination of project emissions, baseline emissions and leakage are correctly presented in a complete and transparent manner. Nevertheless further clarification should be provided for the default values of weighted factors used when calculating the CM. This was raised as a minor issue during the course of the validation, and was corrected by the PP.	Minor issue	OK
	Are detailed calculations provided in a traceable spreadsheet showing relevant information? Are the tables of emission reductions in the PDD (section A.4.4 and B.6.4) consistent with the calculations?	Yes. A comprehensive excel spreadsheet detailing the calculations and relevant information was provided in attachment to the PDD. The tables of the emission reductions in the PDD are consistent with the calculations in the excel spreadsheet.	OK	OK
	Can the calculation of emission reductions be replicated using the data and parameters supplied in the PDD?	Yes. The ER calculations in the spreadsheet /5/ can be fully replicated and the input values are confirmed to be correct/.	OK	OK

Conclusion

ERM CVS confirms that:

As per the VVM paragraph 91, based on the information reviewed and calculations reproduced by the validation team, ERM CVS confirms the following:

- (a) All assumptions and data used by the PPs are listed in the PDD, including their references and sources;
- (b) All documentation used by PPs as the basis for assumptions and the sources of data are correctly quoted and interpreted in the PDD;
- (c) All values used in the PDD are considered reasonable in the context of the proposed CDM 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 PDD.

7. Validation findings – Additionality

As per VVM section 6, ERM CVS assessed the PDD to determine whether it clearly describes how the proposed CDM project activity is additional, as supported by sufficient and appropriate evidence. In accordance with decision 3/CMP.1, annex, paragraph 43, a CDM project activity is additional if anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the registered CDM project activity.

ERM CVS assessed and verified the reliability and credibility of all data, rationales, assumptions, justifications and documentation provided by PPs to support the demonstration of additionality in order to critically assess the presented evidence, using local knowledge and sectoral and financial expertise.

In undertaking this aspect of the validation, ERM CVS considered tools and documents provided by the CDM Executive Board to demonstrate the additionality of proposed CDM project activity, as well as specific complementary or alternative requirements included in the approved CDM methodology.

In the sections below, ERM CVS describes all steps taken, and sources of information used, to cross-check the information contained in the PDD on additionality. Where appropriate, we describe how the validation team determined that the documentation assessed is authentic.

Prior consideration of the CDM

As per VVM section 6a, if the project activity start date is **prior to the date of publication of the PDD** for stakeholder comments, it shall be demonstrated that the CDM benefits were considered necessary in the decision to undertake the project as a proposed CDM project activity. ERM CVS therefore evaluated the start date of the project activity

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
7.1.1	What is the start date of the project activity? Is this before the publication of the PDD for public comments?	The project activity start date is given in the GSP PDD as 15 April 2012, which is after publication of the PDD for public consultation . During the course of the validation, delays to the project meant that the expected starting date of the project activity was delayed until 01 January 2013.	OK	OK
	Is the start date clearly defined in the PDD in accordance with the "Glossary of CDM terms"? Does the PDD contain a description of how this start date has been determined, and a description of the evidence available to support this start date?	The start date of the project activity is defined as the expected date of the wind turbines purchasing contract signature, since this is likely to be the earliest date of construction, implementation or real action on the project activity. ERM CVS confirmed during the site visit that no implementation or real actions had yet taken place on the project. This was confirmed by means of a physical site inspection, interviews with the project developer, interviews with local stakeholders, and review of the draft (but as yet unsigned) wind turbine purchase agreement /09/. ERM CVS therefore confirms that the start date of the project activity, reported in the PDD, is defined in accordance with the "Glossary of CDM terms" and that it takes place after the start of validation. The PDD contains an explanation of the start date.	OK	OK
	Does the PDD provide an implementation timeline of the proposed CDM project activity, in line with the PDD guidelines?	Although a timeline is only required if the starting date of the project activity is before the date of validation, the PPs have nevertheless provided a timeline in the PDD. The timeline is validated below.	OK	OK

The timeline of the project is set out in the table below, showing the evidence used to support each step. ERM CVS reviewed the evidence provided and can confirm that the starting date is correctly defined and that the timeline is credible and supported by reliable evidence.

	Activity	Date	How has ERM CVS validated this information	Draft OK/ CAR/CL	Final OK/ Not OK
7.1.2	Starting of the wind measurement	26/10/2008	This was confirmed by means of interviews with the project developer	OK	OK
	Wind farm study report	19/11/2011	ERM CVS has reviewed the document /10/. However the date in the PDD footnote needs to be corrected. This was raised as a minor issue, and was corrected by the PP.	Minor issue	OK
	CDM Consultant Agreement contract	19/10/2011	This was confirmed by review of the contract. /57/	OK	OK
	CDM prior consideration notification of the project to the CDM Secretariat and to the Moroccan DNA	21/11/2011	ERM CVS has reviewed the notification, which contains the precise geographical location and a brief description of the proposed project activity, using the standardized form F-CDM-Prior Consideration. /58/	OK	OK
	EIA study presentation to the Ministry of Environment	15/12/2011	This was confirmed by review of the EIA /03/	OK	OK
	Stakeholders workshop held	02/02/2012	This was confirmed by review of the stakeholder consultation report and participants list /20/	OK	OK
	LoA issued by Moroccan DNA	10/08/2012	ERM CVS has reviewed the LoA /06/	OK	OK
	Signature construction contract (expected)	January 2013	Expected date	OK	OK
	Construction start of the wind farm (expected)	January 2013	Expected date	OK	OK
	Wind farm expected Commissioning Date	April 2014	Expected date	OK	OK

Conclusion

Based on the evidence provided, ERM CVS confirms that the start date for this project is after the start of validation. Therefore no further validation of prior consideration of CDM is required.

Identification of alternatives

As per VVM section 6b, ERM CVS evaluated whether the PDD clearly describes credible alternatives to the project activity in order to determine the most realistic baseline scenario, unless the approved methodology that is selected by the proposed CDM project activity prescribes the baseline scenario and no further analysis is required. The project applies methodology ACM0002 which defines the baseline as electricity delivered to the grid by the project activity that would have otherwise been generated by the existing grid-connected power plant and the addition of new power sources, as reflected in the combined margin. Therefore no further assessment of baseline alternatives is required.

Conclusion

On the basis of local and sectoral knowledge and the evidence provided, ERM CVS confirms that the baseline is defined in accordance with the applied methodology, and is appropriate based on ERM CVS's local and sectoral knowledge, and complies with all applicable legislation.

Investment analysis

As per VVM section 6c, ERM CVS evaluated the investment analysis presented in the PDD to demonstrate the additionality of the proposed CDM project activity. ERM CVS evaluated whether there is sufficient and reliable evidence to validate that the proposed CDM project activity would not be either:

- the most economically or financially attractive alternative; or

- economically or financially feasible without the revenue from the sale of CERs.

Additionality of the project is demonstrated using the 'Tool for the demonstration and assessment of additionality'. An investment analysis is used to demonstrate that the project activity is not financially or economically feasible without CER revenues, or is not the most financially or economically attractive option.

The financial analysis was assessed by the validation team, including assessment of the spreadsheet and evidences relating to the input values to the financial analysis. The analysis was also assessed by referring to the latest version of the 'Guidelines on the assessment of investment analysis' ('I.A. Guidelines') by a financial expert assigned by ERM CVS, who has specific expertise in the assessment of financial analysis for CDM projects. The validation of the investment analysis is set out below and in the resolution of CARs and CLs relating to the investment analysis.

Evaluation of Analysis Option

PPs can choose one of the following approaches:

- **Option I (Simple Cost Analysis):** Used when the proposed CDM project activity and the identified alternatives would produce no financial or economic benefits other than CDM-related income. It involves documentation of the costs associated with the proposed CDM project activity and the alternatives identified and demonstration that there is at least one alternative which is less costly than the proposed CDM project activity;
- **Option II (Investment Comparison Analysis):** Used to compare the rate of return of the project activity (without CDM) and the alternative(s), to demonstrate whether the proposed CDM project activity is less economically or financially attractive than at least one other credible and realistic alternative;
- **Option III (benchmark analysis):** Used to demonstrate that the financial returns of the proposed CDM project activity would be insufficient to justify the required investment, when compared to a benchmark.

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
7.3.1 (a)	Has the appropriate option been chosen? (as per the <i>Guidance on the Assessment of Investment Analysis</i>)	The PP has chosen the benchmark analysis, which is appropriate given that the project generates revenues from electricity sales (hence option I, simple cost analysis, is not applicable) and the alternative (continuation of electricity supply by the grid) is not a comparable investment alternative (hence option II, investment comparison analysis, is not applicable). The selection by the PP is in line with the 'Tool for the demonstration and assessment of additionality' and the 'Guidance on the assessment of investment analysis'.	OK	OK

Option III evaluation

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
7.3.1 (b)	Is benchmark analysis appropriate? (If the PP has to make an investment, to supply the same outputs and services, and there is at least one other alternative option than building the project activity without CDM, benchmark analysis is not appropriate and investment comparison analysis should be used).	The project developer has the alternative of making no investment (continuation of the supply of electricity from the existing generation mix operating in the grid). The project developer is not obliged to make an investment to supply the same outputs and services.	OK	OK
	Is the most suitable financial indicator for the project type	Yes. Project IRR is used, and this is consistent with the selected benchmark, and is considered reasonable as the basis for making an investment decision of this	OK	OK

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
	and decision-making context clearly identified, such as IRR?	type by a power sector investor, based on ERM CVS's financial and sectoral knowledge.		

Conclusion

ERM CVS confirms that the choice of option used for evaluation of the investment analysis is appropriate for this project activity.

Evaluation of Benchmark/Discount rate

The assessment used an external source of Benchmark or Discount rate. To confirm the suitability of the benchmark applied in the investment analysis, ERM CVS has

- Determined whether the type of benchmark applied is suitable for the type of financial indicator presented;
- Ensured that any risk premiums applied in determining the benchmark reflect the risks associated with the project type or activity;
- Determined whether it is reasonable to assume that no investment would be made at a rate of return lower than the benchmark by, for example, assessing previous investment decisions by the PPs involved and determining whether the same benchmark has been applied or if there are verifiable circumstances that have led to a change in the benchmark.

Details of the validation of the benchmark are provided in the following table:

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
If an external benchmark or discount rate has been used:				
7.3.2 (a)	Is the use of an external benchmark appropriate?	Yes, given that the project developer is not the only company that could potentially develop the project.	OK	OK
	Is the benchmark or discount rate based on publicly available data sources?	<p>Yes, the benchmark study was developed by a third party financial institution, the Moroccan investment Bank Attijari Finances Corp, and is available online /14/. Attijari Finances Corp. is a third party financial institution with experience of investment advisory services in Morocco /51/.</p> <p>However further clarification on the suitability of the benchmark was requested – please see CL 03.</p> <p>Upon conclusion of CL 03, ERM CVS concluded that the study was used due to the lack of official government benchmarks or other publicly available and reliable benchmarks in the host country, which ERM CVS has confirmed based on its local and sectoral knowledge: the renewable energy sector, and independent power projects, is a newly emerging sector within the Moroccan economy. ERM CVS confirmed that the report was developed based on publicly available data sources, <i>inter alia</i> the World Bank /52/, ONEE /53/, the OMPIC (Office Marocain de la Propriete Industrielle et Commerciale - Moroccan office of industrial and commercial enterprises) and information published on the UNFCCC website /21/ <i>inter alia</i> for the Essaouira wind power project (#0030), Tétouan wind farm project for Lafarge cement plant (#0042), and Wind farm extension project for Lafarge's cement plant in Tétouan (not registered).</p>	CL-03	OK
	Is the benchmark based on parameters that are standard in the market? (I.A Guideline	The benchmark is based on analysis of previous electricity generation projects developed in the country and the rates of return achieved by these previous projects (3 wind projects, 1 solar thermal, 1 coal and 1 combined cycle gas) /14/.	CL-03	OK

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK									
	13)	<p>However further clarification on the suitability of the benchmark was requested – please see CL 03.</p> <p>Upon conclusion of CL 03, ERM CVS concluded that, in the benchmark study /14/, different rates of return were derived for different project types, and the report concluded that the benchmark rate of return for wind projects in Morocco should be 12-14%. The underlying data includes all available wind investments in the country, and therefore is based on parameters that are standard in the market.</p> <p>The benchmark can be considered to be in line with the requirements of the guidelines on the assessment of investment analysis (version 05), which require that “The applied benchmark must be suitable for the specific proposed project activity. It is not suitable to compare the return of low risk investments with the returns achieved or achievable by higher risk investments”. The applied benchmark for wind projects was developed based on all wind project investments in Morocco /14/.</p>											
	Are the assumptions underlying the referenced benchmark or discount rate relevant to the sector?	<p>All the information is based on electricity generation investments in Morocco which took place in the past 15 years, including 3 wind farms /14/.</p> <p>In order to determine the benchmark, the study determines the IRR of 6 electricity generation projects in the country to estimate the rate of return expected by similar investors. They divide the investors into 3 types: projects under a concessional scheme, projects developed directly by ONEE, and captive (self) consumption projects and assign different benchmarks to each type /14/. The 6 projects used are:</p> <p>Projects developed under concessional scheme</p> <ul style="list-style-type: none">- The Jorf Lasfar Energy Company (JLEC) Company- The wind farm "Al Koudia Baidya" (CED)- The combined cycle plant of Tahaddart (EET) <p>Projects developed and operated directly by ONEE under an EPC contract</p> <ul style="list-style-type: none">- The Essaouira wind park (CDM)- Solar thermal plant of Ain Beni Mathar <p>Captive power projects:</p> <ul style="list-style-type: none">- Tétouan Wind Farm Project for Lafarge Cement Plant (CDM) <p>However further clarification on the suitability of the benchmark was requested – please see CL 03.</p> <p>Upon conclusion of CL 03, ERM CVS concluded that the assumptions underlying the referenced benchmark or discount rate are relevant to the sector. ERM CVS was able to cross check a sample of the data sources used to determine the benchmark: a detailed explanation of the IRR calculations used to support the study is provided for two projects: CED wind farm and Ain Beni Methar solar thermal plant /14/, and information on the IRR of the Essaouira project and the Jorf Lasfar project is available on the UNFCCC website /21/54/.</p> <p>Two other CDM wind farm projects in Morocco which used an investment analysis are not included in the benchmark, Akhfennir Wind Farm Project and Haouma Wind Farm Project. However ERM CVS was able to review data for these projects on the CDM website /21/ and verified that they applied the same benchmark (based on the same benchmark study /14/) in their investment decisions, which has been validated by a DOE and registered by the CDM Executive Board.</p> <table><tr><th>Name</th><th>IRR achieved</th><th>Benchmark applied</th></tr><tr><td>Akhfennir Wind Farm Project</td><td>9.77%</td><td>12-14%</td></tr><tr><td>Haouma Wind Farm</td><td>10.42%</td><td>12-14%</td></tr></table>	Name	IRR achieved	Benchmark applied	Akhfennir Wind Farm Project	9.77%	12-14%	Haouma Wind Farm	10.42%	12-14%	CL-03	OK
Name	IRR achieved	Benchmark applied											
Akhfennir Wind Farm Project	9.77%	12-14%											
Haouma Wind Farm	10.42%	12-14%											

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK								
		<table><tr><td>Project</td><td></td></tr><tr><td>Tanger wind power project</td><td>Uses levelised cost analysis (not benchmark)</td></tr><tr><td>Tétouan Wind Farm Project for Lafarge Cement Plant</td><td>Uses barriers analysis</td></tr><tr><td>Essaouira wind power project</td><td>Uses unit cost of service</td></tr></table>	Project		Tanger wind power project	Uses levelised cost analysis (not benchmark)	Tétouan Wind Farm Project for Lafarge Cement Plant	Uses barriers analysis	Essaouira wind power project	Uses unit cost of service		
Project												
Tanger wind power project	Uses levelised cost analysis (not benchmark)											
Tétouan Wind Farm Project for Lafarge Cement Plant	Uses barriers analysis											
Essaouira wind power project	Uses unit cost of service											
	Is an appropriate benchmark or discount rate value chosen that is relevant for the project activity (<i>i.e. for this investor, country, risk of project, time of investment decision</i>)?	Following resolution of CL 03, ERM CVS has confirmed that the benchmark is relevant for the project activity, for this investor (wind power project developer), for this country (Morocco), for the risk of the project (the project is a wind project, hence comparable to the wind projects used in the determination of the benchmark), and time of the investment decision (the benchmark is the most recently available document relating to benchmarks for wind energy projects in Morocco). The benchmark has also been applied by two registered CDM wind projects (Akhfennir Wind Farm Project, Haouma Wind Farm Project), hence it was confirmed that it is a reasonable and credible benchmark source.	CL-03	OK								
	Is the chosen benchmark conservative and in line with other benchmarks or discount rates used in current or previous projects by the same investor? (<i>including the benchmark or discount rate used in Feasibility Studies or other financial analyses of the project activity</i>)	<p>ERM CVS confirmed during the site visit interviews and online research that this is the first project developed by the investor in Morocco. UPC Renewables also plans another 50MW project in the south of the country but this is at an early stage of development /22/.</p> <p>However the benchmark can be cross checked with the benchmark applied by other investors and validated in registered CDM project documentation. The benchmark is the same as that applied in both of the other registered CDM wind projects for which the information is available (Akhfennir Wind Farm Project and Haouma Wind Farm Project) /21/.</p>	OK	OK								
	Does the benchmark meet the requirements of the investment analysis guidelines paragraph 15, <i>i.e. if the cost of equity is used in the determination of the benchmark, is the cost of equity determined either by:</i> <i>(a) selecting the values provided in Appendix A of the investment analysis guidelines; or by (b) calculating the cost of equity using best financial practices, based on data sources which can be clearly validated?</i> Are all underlying factors sufficiently justified?	Not applicable – cost of equity is not used as an assumption.	OK	OK								
	If the cost of debt is used in the determination of the benchmark, is it calculated as the cost of financing in the capital markets (e.g. <i>commercial lending rates and guarantees required for the country and the type of project activity concerned</i>), based on documented evidence from financial institutions with regard to the cost of debt financing of comparable projects? In cases where this data is not available, has the	Not applicable – cost of debt is not used as an assumption.	OK	OK								

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
	<i>commercial lending rate in the host country been used to calculate the cost of debt?</i> (I.A. Guideline 16)			
	Is the debt:equity ratio used to determine the benchmark based on the typical debt/equity finance structure observed in the sector of the country? <i>If such information is not readily available, 50% debt and 50% equity financing may be assumed as a default.</i> (I.A. Guideline 18)	Not applicable – debt/equity ratio is not used as an assumption.	OK	OK
Risk Premiums				
7.3.2 (b)	Are risk premiums applied in the development of the benchmark or discount rate? If so, are they reasonable and justified? How has this been validated?	A benchmark determined by independent financial experts is used and no additional risk premiums are applied.	OK	OK

Investment analysis assumptions and Input Values

ERM CVS evaluated the assumptions and input values used in the investment analysis

Assumptions based on Feasibility Study Reports (FSR)

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
7.3.1	Has the FSR been the basis of the decision to proceed with the investment in the project? How has this been verified?	Not applicable. An FSR was not used as the basis of the input values in the investment analysis. The input values have been validated against the original quotations, contracts (e.g. PPAs), etc for the project, which are considered credible and reliable third party sources. Please see below for further information on how the input values were validated.	n/a	n/a
	Are the values used in the PDD and associated annexes valid and consistent with the FSR?	Not applicable	n/a	n/a
	At the time of the investment decision, are the input values from the FSR valid and applicable <i>(based on specific local and sectoral expertise and knowledge)</i> ?	Not applicable	n/a	n/a

Input values used in the investment analysis

As per VVM paragraph 111 (a to c) ERM CVS has conducted a thorough assessment of all parameters and assumptions used in calculating the relevant financial indicator, and determined the accuracy and suitability of these parameters using the available evidence and expertise in relevant accounting practices. ERM CVS has cross-checked the parameters against third-party or publicly available sources, such as invoices or price indices where available, and has reviewed feasibility reports, public announcements and annual financial reports, where available, related to the proposed CDM project activity and the PPs. CL 04 was raised to further substantiate all the input values to the financial analysis, since sufficient supporting evidence was lacking at the site visit stage. In response to the draft validation findings, the PP revised the investment analysis to correctly reflect the financial situation of the proposed project based on the quotations, contracts etc received. The input values to the financial analysis were then validated and cross checked by ERM CVS and details of the validation activities and cross checks carried out are set out as follows. In order to present the validation findings clearly and transparently, first a table summarising the validation of the key input parameters (investment costs, O&M costs, electricity tariff and electricity generation) is presented, and then a more detailed table validating the detailed breakdown of each of the input values to the financial analysis is presented:

Table 7.3.3 (a): Key input parameters to the financial analysis

Key Input parameter	Validation (summary of how this parameter was validated)
Investment costs	The main component is the equipment (turbines, towers and anchor cages) which was confirmed against the quote from Vestas /26/. Civil works were validated against the quotation provided by Vestas /40/ and the independent assessment by Careolus /37/. The cost of the 33 KV Collector System was validated against the quote from Global Energie /50/.
O&M costs	Operating Expenses (excluding annual turbine O&M/servicing) were confirmed against the third party assessment by Caleolus /32/. Land costs were validated against the original official land rent contracts /56/. Turbine O&M/servicing costs were validated against the Draft agreement between Vestas France SAS and UPC Renewables SARL /46/. Consumables, unscheduled maintenance, other maintenance and maintenance contingency were validated against the independent report by Caleolus /32/.
Electricity tariff	The electricity tariffs were validated against the PPAs with Holcim /44/ and OCP /45/.
Electricity generation	The quantity of electricity generation was confirmed against the third party assessment report /39/ and the PPAs with Holcim /44/ and OCP /45/.

Table 7.3.3 (b): detailed analysis of the input parameters to the financial analysis

Input parameter	Value	Validation (source of the value used in the PDD financial analysis, including justification and substantiation of information, data and evidence)	Cross check (cross check of parameter against other sources or sectoral/financial knowledge, including justification and substantiation of information, data and evidence)	Final OK/ Not OK
Macroeconomic parameters				
Exchange Rate Versus USD	1.238	Confirmed against the exchange rate service xe.com /49/	No cross check required – this is a publically available and reputable source and the value is internationally recognised	OK
Exchange Rate Versus Morocco Dirhams	10.99	Confirmed against the exchange rate service xe.com /49/	No cross check required – this is a publically available and reputable source and the value is internationally recognised	OK
Local Inflation Rate (cost)	1.4%	Validated against the publicly available reference /55/	No cross check required – this is a publically available and reputable source and the value is internationally recognised	OK
Debt Service Reserve Account (P+I)	6 months	Validated against the IFC Mandate Letter /25/	This is reasonable based on ERM CVS's financial knowledge and expertise. A project IRR is calculated and as such no cash flows relating to the debt service reserve are included in the investment analysis.	OK
Project design parameters				
Wind Turbine Model	Vestas V90	Confirmed against equipment purchase agreement /09/	Cross checked against the quotation from Vestas /26/	OK
Number of Turbines	40	Confirmed against equipment	Cross checked against the quotation	OK

Input parameter	Value	Validation (source of the value used in the PDD financial analysis, including justification and substantiation of information, data and evidence)	Cross check (cross check of parameter against other sources or sectoral/financial knowledge, including justification and substantiation of information, data and evidence)	Final OK/ Not OK
		purchase agreement /09/	from Vestas /26/	
Turbine Capacity (Vestas)	3	Confirmed against equipment purchase agreement /09/	Cross checked against the quotation from Vestas /26/	OK
Total Installed Capacity (in KW)	120,000	Confirmed against equipment purchase agreement /09/	Cross checked against the quotation from Vestas /26/. Confirmed against the technical documentation of the project, for example reference /39/	OK
Financial Close	31-Dec-12	Confirmed as reasonable and in line with the schedule of the project, based on interviews with the project developer on site.	ERM CVS confirmed that the financial closure has not happened yet at the time of validation therefore no documentary evidence is available to cross check.	OK
Construction Period	16 months	Confirmed against the reference provided by the third party Caleolus /36/	This is reasonable for a project of this type, based on ERM CVS's local and sectoral knowledge	OK
Number of Years of Operations	20 years	Confirmed against the equipment certification of the Vestas turbines carried out by Det Norske Veritas /23/	This is consistent with the assessment period. The lifetime is considered reasonable for a project of this type, based on ERM CVS's local and sectoral knowledge	OK
Investment costs Total: € 119,841,730 (MAD 1,317,060,616). 1st Year Project Cost Injection MAD 948,283,644; 2nd Year Project Cost Injection MAD 368,776,972. >> Calculated based on the sum of the items below. Each item is validated individually in order to provide a higher level of assurance.				
Wind turbine equipment				
Turbine, Towers and Anchor Cages and Transport from Factory to Port	€ 78,860,000	Confirmed against the quote from Vestas /26/.	Cross check: Independent consultant Caleolus /36/ confirmed that the cost in the quotation is a reliable basis for the turbine cost	OK
Transportation				
Port to Port (Excluding Towers)	€ 686,591	Confirmed against the quotation provided by Salamambo /28/. The document is a specific third party quotation for the proposed project and therefore is reliable	No cross check is available however the value is considered reasonable based on ERM CVS's local and sectoral knowledge, and has a very small impact on the IRR	OK
Port to Site	€ 1,625,650	Confirmed against the quotation provided by Salamambo /27/. The document is a specific third party quotation for the proposed project and therefore is reliable	No cross check is available however the value is considered reasonable based on ERM CVS's local and sectoral knowledge, and has a very small impact on the IRR	OK
Civil works				
Roads & Pads	€ 12,717,280	Confirmed against the quotation provided by Vestas /40/	Cross checked against the independent assessment by Careolus /37/	OK
Foundations	€ 5,600,000	Confirmed against the quotation provided by Vestas /40/	Cross checked against the independent assessment by Careolus /37/	OK
Erection	€ 2,236,000	Confirmed against the independent assessment by Careolus /37/	Cross checked against the proposal from Sarens for the installation/erection of the wind turbines /41/	OK
Foundation Design	€ 55,000	Confirmed against the proposal from CTE /42/	Cross checked against the independent assessment by Careolus /37/	OK
33 KV Collector System				
Cables	€ 2,549,800	Validated against the quotation from Global Energie /50/	Cross checked against the independent assessment by Caleolus /37/.	OK
Connectors	€ 97,500	Validated against the quotation from Global Energie /50/	Cross checked against the independent assessment by Caleolus /37/.	OK
Civil Work	€ 1,200,000	Validated against the quotation from Global Energie /50/	Cross checked against the independent assessment by Caleolus	OK

Input parameter	Value	Validation (source of the value used in the PDD financial analysis, including justification and substantiation of information, data and evidence)	Cross check (cross check of parameter against other sources or sectoral/financial knowledge, including justification and substantiation of information, data and evidence)	Final OK/ Not OK
Engineering	€ 50,000	Validated against the quotation from Global Energie /50/	/37/. Cross checked against the independent assessment by Caleolus /37/.	OK
Construction Management	€ 120,000	Validated against the quotation from Global Energie /50/	Cross checked against the independent assessment by Caleolus /37/.	OK
Substation				
Substation Civil	€ 3,803,842	Validated against the quotation from Global Energie /50/	Cross checked against the independent assessment by Caleolus /37/.	OK
Transformers(2X 80 MVA)	€ 2,194,000	Validated against the quotation from Global Energie /50/	Cross checked against the independent assessment by Caleolus /37/.	OK
Engineering	€ 50,000	Validated against the quotation from Global Energie /50/	Cross checked against the independent assessment by Caleolus /37/.	OK
Other Components	€ 1,495,620	Validated against the quotation from Global Energie /50/	Cross checked against the independent assessment by Caleolus /37/.	OK
High Voltage Spans	€ 790,200	Validated against the quotation from Global Energie /50/	Cross checked against the independent assessment by Caleolus /37/.	OK
Construction Management	€ 190,000	Validated against the quotation from Global Energie /50/	Cross checked against the independent assessment by Caleolus /37/.	OK
Mobilisation/Demobilization	€ 100,000	Validated against the quotation from Global Energie /50/	Cross checked against the independent assessment by Caleolus /37/.	OK
Transmission line				
Transmission Line	€ 3,600,000	Validated against the quotation from Global Energie /50/	Cross checked against the independent assessment by Caleolus /37/.	OK
Other costs				
Contingency (% of balance of plant)	3.00%	CL 05 was raised to substantiate the contingency. Upon closure of CL 05, the revised contingency of 3% was validated against the independent assessment by Careolus /37/	The value is considered reasonable based on ERM CVS's local and sectoral knowledge	OK
Contingency Amount in EUR	€ 1,174,844	Calculated	n/a	OK
Legal Fees	€ 305,000	Validated against the quotation from Naciri and Associates with Allen and Overy /31/.	Cross check: The quote gives detailed information on the services to be provided, hourly rates charged, and a detailed breakdown of the costs as follows: Legal Due Diligence €100,000; Investment Documents and Coordination €120,000, Closing and Post-Closing Matters, and Other €70,000, Total Expenses: €15,000, and the costs are considered reasonable based on ERM CVS's local and sectoral knowledge.	OK
Insurance (construction)				
Marine cargo	€ 133,324	Validated against the quotation provided by G-Cube /43/. The quotation provides a detailed breakdown of the cover provided.	Cross checked against the insurance premium document from G-Cube /47/	OK
Construction All Risk (CAR) and Construction All Risk (CAR) Fronting Fee and Local Taxes	€ 207,079	Validated against the quotation provided by G-Cube /29/. The quotation provides a detailed breakdown of the cover provided.	Cross checked against the insurance premium document from G-Cube /47/	OK
Funding sources				
Equity (as % of total costs)	30.00%	No documentary evidence was	The debt:equity ratio is considered	OK

Input parameter	Value	Validation (source of the value used in the PDD financial analysis, including justification and substantiation of information, data and evidence)	Cross check (cross check of parameter against other sources or sectoral/financial knowledge, including justification and substantiation of information, data and evidence)	Final OK/ Not OK
		available to support the debt:equity split as the loan contract has not been signed yet. However the debt:equity ratio is within the maximum debt:equity ratio stipulated in the mandate letter from the IFC /25/	reasonable based on ERM CVS's financial and sectoral knowledge	
Debt (as % of total costs)	70.00%			
Debt structure pricing				
Interest Rate	0.32%	Consistent with the IFC Mandate Letter /25/	ERM CVS confirmed that the financial closure has not happened yet at the time of validation therefore no documentary evidence is available to cross check. However the value is reasonable based on ERM CVS's financial knowledge	OK
Upfront Fee	1.50%	Consistent with the IFC Mandate Letter /25/		OK
Flat Fee	€ 300,000.00	Consistent with the IFC Mandate Letter /25/		OK
Margin	3.50%	This is consistent with the IFC Mandate Letter /25/.	The lower end of the range of 3% to 3.5% is chosen, which is conservative.	OK
Term (from first drawdown)	15 years	Consistent with the IFC Mandate Letter /25/	ERM CVS confirmed that the financial closure has not happened yet at the time of validation therefore no documentary evidence is available to cross check. However the value is reasonable based on ERM CVS's financial knowledge	OK
Average DSCR	1.50x	Consistent with the IFC Mandate Letter /25/		OK
Electricity tariff				
Energy Rate - On-Peak (HPL) for High Tension (60KV)	661 MAD kWh/yr	Validated against the PPAs with Holcim /44/ and OCP /45/	Cross checked against the revised tariffs published by the Government of Morocco /34/	OK
Energy Rate - Off-Peak (HC) for High Tension (60KV)	435 MAD kWh/yr	Validated against the PPAs with Holcim /44/ and OCP /45/	Cross checked against the revised tariffs published by the Government of Morocco /34/	OK
Energy Rate - Super-Peak (SHP) for High Tension (60KV)	1498 MAD kWh/yr	Validated against the PPAs with Holcim /44/ and OCP /45/	Cross checked against the revised tariffs published by the Government of Morocco /34/	OK
Energy Rate - Rushhour (HP) for High Tension (60KV)	938 MAD kWh/yr	Validated against the PPAs with Holcim /44/ and OCP /45/	Cross checked against the revised tariffs published by the Government of Morocco /34/	OK
Energy Rate - On-Peak (HPL) for Very High Tension (THT) (150 and 225 KV)	628 MAD kWh/yr	Validated against the PPAs with Holcim /44/ and OCP /45/	Cross checked against the revised tariffs published by the Government of Morocco /34/	OK
Energy Rate - Off-Peak (HC) for Very High Tension (THT) (150 and 225 KV)	411 MAD kWh/yr	Validated against the PPAs with Holcim /44/ and OCP /45/	Cross checked against the revised tariffs published by the Government of Morocco /34/	OK
Energy Rate - Rushhour (HP) for Very High Tension (THT) (150 and 225 KV)	1078 MAD kWh/yr	Validated against the PPAs with Holcim /44/ and OCP /45/	Cross checked against the revised tariffs published by the Government of Morocco /34/	OK
Discount to published rates as agreed by Holcim	8%	Validated against the PPA with Holcim /44/	The rate is defined in the specific agreement with Holcim and hence no cross check evidence is available. However the PPA is a credible third party legal contract and hence is considered a reliable source.	OK
Discount to published rates for On-Peak as agreed by OCP	0.0%	Validated against the PPA with OCP /45/		OK
Discount to published rates for Off-Peak as agreed by OCP	0%			OK
Discount to published rates for Rush-hour as agreed by OCP	0%			OK
Proportion of Energy sold to Holcim at HPL	44%	Confirmed against the third party assessment by Caleolus /35/	Cross checked against the PPA with Holcim /44/	OK
Proportion of Energy sold to Holcim at HC	35%	Confirmed against the third party assessment by Caleolus /35/	Cross checked against the PPA with Holcim /44/	OK
Proportion of Energy sold to Holcim at SHP	8%	Confirmed against the third party assessment by Caleolus /35/	Cross checked against the PPA with Holcim /44/	OK
Proportion of Energy sold to	12%	Confirmed against the third party	Cross checked against the PPA with	OK

Input parameter	Value	Validation (source of the value used in the PDD financial analysis, including justification and substantiation of information, data and evidence)	Cross check (cross check of parameter against other sources or sectoral/financial knowledge, including justification and substantiation of information, data and evidence)	Final OK/ Not OK
Holcim at HP		assessment by Caleolus /35/	Holcim /44/	
Proportion of Energy sold to OCP at HPL	44%	Confirmed against the third party assessment by Caleolus /35/	Cross checked against the PPA with OCP /45/	OK
Proportion of Energy sold to OCP at HC	35%	Confirmed against the third party assessment by Caleolus /35/	Cross checked against the PPA with OCP /45/	OK
Proportion of Energy sold to OCP at HPL	21%	Confirmed against the third party assessment by Caleolus /35/	Cross checked against the PPA with OCP /45/	OK
Electricity Tariff - Holcim	630 MAD MWh/yr	Confirmed against the PPA with Holcim /44/	Cross checked against the revised tariffs published by the Government of Morocco /34/	OK
Electricity Tariff - OCP	644 MAD MWh/yr	Confirmed against the PPA with OCP /45/	Cross checked against the revised tariffs published by the Government of Morocco /34/	OK
Total Energy sold to Holcim	100,000 MWh/yr	Confirmed against the PPA with Holcim /44/	Confirmed against the third party assessment by Caleolus /35/	OK
Total Energy sold to OCP	196,100 MWh/yr	Confirmed against the PPA with OCP /45/	Confirmed against the third party assessment by Caleolus /35/	OK
Weighted Average of Electricity Tariff	639 MAD MWh/yr	Calculated	n/a	OK
Annual Tariff Rate Increase - Holcim	0.005 every 1 year/s	Confirmed against the PPA with Holcim /44/	The rate is defined in the specific agreement with Holcim and hence no cross check evidence is available. However the PPA is a credible third party legal contract and hence is considered a reliable source.	OK
Annual Tariff Rate Increase - OCP	0.03 every 3 year/s	Confirmed against the PPA with OCP /45/	The rate is defined in the specific agreement with OCP and hence no cross check evidence is available. However the PPA is a credible third party legal contract and hence is considered a reliable source.	OK
Weighted Average of Annual Tariff Rate Increase	0.83%	Calculated	n/a	OK
Transmission Line Loss	3.00%	Confirmed against the reference provided by ONEE /24/	Cross checked against the electricity supply agreement with Holcim /44/	OK
Wheeling Charge	80 MAD MWh/yr	Confirmed against the reference provided by ONEE /24/	No documentary evidence was available for cross check, however the document is an official reference from ONEE and hence is considered reliable	OK
Electricity Production				
Net P90 Output (kWh)	296,100,000	Confirmed against the third party assessment report /39/.	Cross checked against the Draft agreement between Vestas France SAS and UPC Renewables SARL: SERVICE & AVAILABILITY AGREEMENT (AOM 4000) relating to KHALLADI WIND FARM /46/.	OK
Load Factor at P90	28.17%	ERM CVS confirmed the value by validating the wind assessment report prepared by Garrad Hassan France SARL 'Assessment of the energy production of the proposed El Khalladi Wind Farm in the Kingdom of Morocco' /39/, which was prepared for the lender, International Finance Corporation, and can therefore be considered a reliable and authoritative document. The load factor of the project was therefore found to be in line with the 'Guidelines for the reporting and validation of plant load factors' version 01 (EB 48, Annex 11).	Cross checked against the mandate letter from the International Finance Corporation that is expected to provide debt financing to the project /25/ which demonstrates that the IFC, made the decision in principle to lend to the project on the basis of the P90 (probability of 90%) scenario for electricity generation. It therefore confirms that the P90 scenario is used by the lender and is the basis of the decision to go ahead with the project, and should therefore be the basis of the financial analysis	OK
Operating costs				

Input parameter	Value	Validation (source of the value used in the PDD financial analysis, including justification and substantiation of information, data and evidence)	Cross check (cross check of parameter against other sources or sectoral/financial knowledge, including justification and substantiation of information, data and evidence)	Final OK/ Not OK
Operating Expenses (excluding annual turbine O&M)	€ 250,000 per annum	Confirmed against the third party assessment by Caleolus /32/.	The independent entity Caleolus researched the balance of plant operational (e-g- non Turbine related) costs that might typically be expected to be incurred for a 40 x 3 MW wind project located in Morocco. They considered the type of equipment that will be installed and its location, and considered prevailing wage rates in Morocco as well as local transportation and lodging costs. Caleolus estimated the annual operating expenses of the balance of plant (i.e. everything except the turbines) to be €250,000	OK
Land Rent during Operating Period	€ 22,290 per annum	Validated against the original official land rent contracts /56/	Since the original land rent contracts were validated directly, no further cross check was necessary, since the value is officially agreed and fixed	OK
Annual O&M Cost (turbine) per year (the equipment supplier Vestas will service the turbines and will charge a fixed annual maintenance fee. The value increases as the age of the equipment goes up, and has been validated for each year of the operating period against the agreement with Vestas as follows)				
Year 1	€ 753,780 per annum	Validated against the Draft agreement between Vestas France SAS and UPC Renewables SARL: SERVICE & AVAILABILITY AGREEMENT (AOM 4000) relating to KHALLADI WIND FARM /46/ which runs up to year 15. After 15 years, the PPs have increased the price according to the trend of prices over the 15 year period, which is considered reasonable.	Since the project has not yet started operating, data to cross check the values is not yet available. However since the costs are pre agreed with Vestas and will not change, and given that the agreement with Vestas is an official legal contract and hence a reliable source, not further cross check was necessary.	OK
Year 2	€ 753,780 per annum			
Year 3	€ 1,508,580 per annum			
Year 4	€ 1,508,580 per annum			
Year 5	€ 1,508,580 per annum			
Year 6	€ 2,248,080 per annum			
Year 7	€ 2,248,080 per annum			
Year 8	€ 2,248,080 per annum			
Year 9	€ 2,248,080 per annum			
Year 10	€ 2,248,080 per annum			
Year 11	€ 2,987,580 per annum			
Year 12	€ 2,987,580 per annum			
Year 13	€ 2,987,580 per annum			
Year 14	€ 2,987,580 per annum			
Year 15	€ 2,987,580 per annum			
Year 16	€ 3,883,854 per annum			
Year 17	€ 3,883,854 per annum			
Year 18	€ 3,883,854 per annum			
Year 19	€ 3,883,854 per annum			
Year 20	€ 3,883,854 per annum			
Consumables	€ 8,333 per annum	Confirmed against the independent	The independent entity Caleolus researched the balance of plant	OK

Input parameter	Value	Validation (source of the value used in the PDD financial analysis, including justification and substantiation of information, data and evidence)	Cross check (cross check of parameter against other sources or sectoral/financial knowledge, including justification and substantiation of information, data and evidence)	Final OK/ Not OK
Unscheduled Maintenance	€ 125,000 per annum	report by Caleolus /32/.	operational (e-g- non Turbine related) costs that might typically be expected to be incurred for a 40 x 3 MW wind project located in Morocco. They considered the type of equipment that will be installed and its location, and considered prevailing wage rates in Morocco as well as local transportation and lodging costs. Caleolus estimated the annual operating expenses of the plant to be €250,000 accordingly.	
Other Maintenance	€ 25,000 per annum			
Maintenance Contingency	€ 100,000 per annum			
Insurance (operation)				
Property Damage (turbines)	€ 317,770	Validated against the insurance premium document from G-Cube /47/	No cross check was available however since the value has been confirmed directly with the insurance premium offer, it is considered reliable	OK
Balance sheet assumptions				
Depreciation				
% of Costs Depreciable	100%	Validated against the Code General des Impots 2010 (general tax code 2010) /33/	The value is fixed by host country standards, hence no further cross check was necessary.	OK
Depreciable Basis	Straight Line	Validated against the Code General des Impots 2010 (general tax code 2010) /33/	Consistent with ERM CVS's financial knowledge.	OK
Straight Line Basis (yrs)	10.00	The depreciation rate of 10%, i.e. straight line depreciation over a period of 10 years, was confirmed by review of the 'Code General des Impots' (general tax code) of Morocco, where the depreciation rate of 10% should be applied to machinery and equipment /33/	Consistent with ERM CVS's financial knowledge.	OK
Tax				
Income Tax (1-10 years)	30%	Validated against the 'Invest in Morocco' factsheet /48/	The tax rate is standard in Morocco.	OK
Income Tax Rate (11-20 years)	30.0%			OK
Income Tax Rate (21- years)	30.0%			OK
Tax Loss Carry Over	100%	In line with standard accounting practice and with ERM CVS's financial knowledge	According to a 2012 report /59/ published by Deloitte, one of the World's largest professional services companies, tax losses incurred in Morocco can be carried forward for up to 4 years while the portion of the loss which relates to depreciation can be carried forward indefinitely. ERM CVS confirms that carrying forward all losses indefinitely in the investment analysis is conservative.	OK

Investment analysis calculations

As per VVM paragraph 111(d) ERM CVS has assessed the correctness of computations carried out and documented by the PPs as follows:

Spreadsheet evaluation

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
7.3.3	<p>Has the PP supplied unprotected and traceable spreadsheet versions of all investment analysis?</p> <p>Have the listed input values been consistently applied in all calculations?</p> <p>Are the computations/formulae correct? (this includes the computations implicit in input values, such as technical calculations of the amount of energy demanded or sold etc)</p> <p>From the investment analysis provided, is it possible to reproduce the results?</p>	<p>A project IRR has been used. However finance related expenditure is included in the net cash flow, therefore CAR 04 was raised.</p> <p>Sensitivity analysis was not included in the financial analysis spreadsheet, therefore CAR 05 was raised.</p> <p>CDM costs were erroneously included in the financial analysis calculations, therefore CAR 02 was raised.</p> <p>Payment terms for debtors and creditors were included in the original version of the investment analysis. CL 06 was raised to substantiate the value. In the revised analysis, payment terms for creditors and debtors were no longer relevant, since a project IRR comparison is presented. Therefore CL 06 was closed.</p> <p>The PP has supplied a revised version of the financial analysis spreadsheet which provided traceable calculations /04/. Finance related expenditure is no longer included in the net cash flow, therefore CAR 04 was closed. The sensitivity analysis was traceably calculated in the revised spreadsheet, therefore CAR 05 was closed. CDM costs are no longer included in the analysis, therefore CAR 02 was closed. Please refer to appendix B for further details.</p> <p>By review of the revised financial analysis spreadsheet /04/, ERM CVS can confirm that the listed input values have been consistently applied in all calculations, the computations and formulae are correct, and ERM CVS is able to reproduce the results.</p>	<p>CAR-02</p> <p>CAR-04</p> <p>CAR-05</p> <p>CL-06</p>	OK

Depreciation and residual value

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
7.3.4	<p>Is any residual value of the project activity assets included in the analysis?</p> <p>Are residual value assumptions reasonable and justified and consistent with local accounting rules/international best practice/industry experience?</p>	<p>No residual value was included in the analysis. Please provide evidence supporting this assumption – see CL 07</p> <p>The PP provided a revised investment analysis /04/, and justified the fact that residual value is zero. The assessment period is consistent with the technical lifetime of the project activity and the project assets are fully depreciated during the assessment period. No residual value is therefore included in the investment analysis, which is consistent with the 'Guidelines on the assessment of investment analysis'. Therefore CL 07 was closed.</p>	CL-07	OK
	<p>Is the depreciation consistent with the assessment period and the residual value?</p> <p>Are depreciation costs/periods consistent with local accounting regulations?</p>	<p>The depreciation rates in the investment analysis spreadsheet were not supported by evidence. Therefore CL 08 was raised.</p> <p>The PP provided a revised version of the investment analysis spreadsheet, which was reviewed by ERM CVS /04/. All assets are depreciated over 10 years, equivalent to a depreciation rate of 10%, i.e. straight line depreciation over a period of 10 years. This rate was confirmed by review of the 'Code General des Impôts' (general tax code) of Morocco, where the depreciation rate of 10% should be applied to all machinery and equipment /33/. Therefore CL 08 was closed.</p>	CL-08	OK
	Is depreciation correctly	The depreciation rates in the investment analysis spreadsheet were not	CL-08	OK

	<p>accounted for?</p> <p><i>(Depreciation costs (and other non-cash items) related to the project activity should be <u>excluded (not deducted)</u> from net Cash Flow used for calculating the financial indicator (e.g. IRR, NPV). Depreciation is relevant only for the calculation of income tax.)</i></p>	<p>supported by evidence. Therefore CL 08 was raised.</p> <p>In the revised analysis /04/, depreciation is correctly accounted for. Depreciation costs are excluded from the cash flow and are only included for the purposes of determining income tax. CL 08 was therefore closed.</p>		
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Taxation and interest

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
7.3.12	Is the treatment of taxation consistent with the chosen benchmark or discount rate? <i>(i.e. taxation should only be treated as an expense in the IRR/NPV calculation if the chosen benchmark or discount rate is intended for post-tax calculations?)</i>	Yes, the treatment of taxation is consistent with the chosen benchmark. Both the investment analysis and the benchmark are post-tax.	OK	OK
	<p>For post-tax benchmarks or discount rates :</p> <p>a) Are interest costs included in the calculation of net taxable income and thus tax?</p> <p>b) Are interest costs calculated in accordance with the <i>Guidance on the Assessment of Investment Analysis</i>?</p>	<p>A post-tax benchmark is applied.</p> <p>a. Interest costs are not deducted from Net Cash Flow in the calculation of project IRR /04/.</p> <p>b. Interest payments are correctly accounted for in line with the Guidelines on the Assessment of Investment Analysis.</p> <p>Please clarify the debt / equity ratio for the proposed project, with evidence – CL 09</p> <p>Please provide source documents supporting the loan terms – CL 09</p> <p>The IFC mandate letter /25/ stipulates the maximum debt:equity ratio, however the loan is not finally agreed yet. The debt equity ratio applied in the proposed project is therefore the ratio expected by the PPs. The ratio is considered reasonable based on ERM CVS's sectoral and financial knowledge.</p> <p>Evidence to support the loan terms was provided. The loan terms are consistent with the IFC Mandate Letter /25/ – please refer to table 7.3.2 above for further details of how each item was validated. CL 09 was closed.</p>	CL-09	OK
	<p><i>If a Project IRR has been used:</i> Are the costs of financing expenditures excluded from the calculation of Project IRR? <i>(financing costs should not be deducted from Net Cash Flow)</i></p> <p><i>If an Equity IRR has been used:</i> Is the debt portion of the investment cost excluded as</p>	<p>A project IRR has been used. However finance related expenditure is included in the net cash flow, therefore CAR 04 was raised.</p> <p>The PP has supplied a revised version of the financial analysis spreadsheet which provided traceable calculations /04/. Finance related expenditure is no longer included in the net cash flow, therefore CAR 04 was closed.</p>	CAR-04	OK

	a cash outflow and the interest costs and principal repayments included as costs?			
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Recommended projects (Project activities where an investment decision was taken but implementation subsequently ceased)

The project is not a recommended project. This was confirmed by means of the site visit and interviews with the project developer.

Sensitivity analysis

A sensitivity analysis has been carried out to demonstrate the impact on the IRR of variations in the key input values to the financial analysis in accordance with the *Guidelines on the assessment of investment analysis*. All costs and revenues greater than or equal to 20% of total costs / revenues have been included in the analysis. The variation in each parameter needed in order for the IRR to reach the benchmark, and the likelihood of such variations taking place, are explained in the PDD. As per VVM paragraph 111(e) ERM CVS has assessed the sensitivity analysis by the PPs to determine under what conditions variations in the result would occur, and the likelihood of these conditions. ERM CVS has reviewed the calculations for the sensitivity analysis which are presented in the IRR Spreadsheet /04/ and checked whether the computations are reproduced as correct and consistent with the information presented in the PDD.

The findings of the validation of sensitivity analysis are set out below.

	Parameters ≥ 20% of costs or revenues (list all)	Is the parameter included in the PDD sensitivity analysis?	Is the sensitivity analysis correctly calculated and traceable?	Is the degree of variation reasonable ?	Validation of why such variation is considered unlikely, based on evidence	Draft conclus ion [OK/ CAR / CL]	Final conclus ion [OK/Not OK]
7.3.14	Investment costs	Yes	The sensitivity analysis is not included in the spreadsheet – CAR 05 The sensitivity analysis was included in the spreadsheet and CAR 05 was closed	Yes	The investment costs have been validated against quotations and procurement contracts from Vestas /26/40/, Salammbo /27/28/, Global Energie /50/, Sarens /41/, and CTE /42/. Each component of the investment costs has been validated in detail against third party documentation. The costs were cross checked against independent assessment reports from Caleolus /37/36/ which looked at the costs of the proposed project and concluded that they are reasonable and unlikely to vary significantly. The price of the turbines, the main element of the investment costs, is already fixed by agreement with Vestas /26/. Furthermore, according to inflation data for Morocco, the current rate of inflation in the country is 1.4%, and the average rate of inflation between 1999 and 2010 was 1.71%. Given the sustained price inflation in Morocco over recent years, it is considered unlikely that variable elements of the investment costs could decrease to the extent whereby the IRR crosses the benchmark (27.85%).	CAR-05	OK
	Electricity tariff	Yes	The sensitivity analysis is not included in the spreadsheet	Yes	The electricity tariff is already agreed in PPAs with Holcim and OCP /44/45/. The price in the PPAs is based on the tariff rates set by the Government of Morocco, over which the project developer has no control /34/. An annual rate of increase in the tariff is already included in the analysis and this has been	CAR-05	OK

	Parameters ≥ 20% of costs or revenues (list all)	Is the parameter included in the PDD sensitivity analysis?	Is the sensitivity analysis correctly calculated and traceable?	Is the degree of variation reasonable ?	Validation of why such variation is considered unlikely, based on evidence	Draft conclus ion [OK/ CAR / CL]	Final conclus ion [OK/Not OK]
			<p>– CAR 05</p> <p>The sensitivity analysis was included in the spreadsheet and CAR 05 was closed</p>		agreed and fixed in the PPAs /44/45/. Hence it is considered unlikely for the electricity tariff to increase significantly to the extent here the IRR crosses the benchmark (38.8%).		
	Annual electricity generation	Yes	<p>The sensitivity analysis is not included in the spreadsheet – CAR 05</p> <p>The sensitivity analysis was included in the spreadsheet and CAR 05 was closed</p>	Yes	The electricity generation has been determined by an independent third party based on 30 months of site measurements of wind speed data, as well as historical climate data, site characteristics, and the design specifications of the wind turbines themselves /39/. The annual electricity supplied has been cross checked against the Draft service and availability agreement between Vestas France SAS and UPC Renewables SARL /46/. Furthermore, the annual electricity supplied has been confirmed against the information provided to the lender which forms the basis of the IFC's decision in principle to lend to the project /25/. Although the electricity generation of the project may vary, it is considered unlikely that the electricity generation will vary by to the extent that the IRR crosses the benchmark (38.8%).	CAR-05	OK
	Operation and Maintenance costs	Yes	<p>The sensitivity analysis is not included in the spreadsheet – CAR 05</p> <p>The sensitivity analysis was included in the spreadsheet and CAR 05 was closed</p>	Yes	Each element of the O&M costs has been validated in detail against contracts, quotations, and expert assessments. It is therefore considered unlikely that the O&M costs will vary to the extent where the IRR reaches the benchmark. The largest portion of the O&M costs is the Annual O&M Cost (turbine) per year (the equipment supplier Vestas will service the turbines and will charge a fixed annual maintenance fee. The value increases as the age of the equipment goes up, and has been validated for each year of the operating period against the agreement with Vestas). This costs is fixed and will not vary from the values presented in the agreement with Vestas. Even if these other O&M costs are assumed as zero in the analysis, the IRR reaches only 7.93%. In fact, even if all O&M costs are zero, the IRR still does not reach the benchmark.	CAR-05	OK

Investment analysis conclusion

On the basis of its specific local and sectoral expertise, ERM CVS has confirmed that the input values to the investment analysis are valid and applicable at the time of the investment decision. Further details on the cross checks carried out on the input parameters are given above.

The PDD presents the key input parameters and results of the IRR of the project, and ERM CVS assessed the correctness of computations carried out by the PPs by reproducing the results using the IRR calculation spreadsheet /04/. The validation team confirms that the calculations are correct and traceable. All input values used in the spreadsheet are consistent with the PDD and the supporting evidence documents (see 7.3.2 above) and the calculation is in line with the *Guidelines on the Assessment of Investment Analysis*, and is considered reasonable on the basis of ERM CVS's local and sectoral expertise and financial knowledge.

The IRR of the project without CDM income is well below the benchmark of 12%, and hence it can be concluded that the project is additional.

Barrier Analysis

Barrier analysis has not been used to demonstrate the additionality of the proposed CDM project activity.

Common practice analysis

The proposed project activity is a large-scale project and therefore common practice analysis has been carried out as a credibility check of the other available evidence used by the PPs to demonstrate additionality. This is a test to complement the investment analysis (Step 2 of the additionality tool) to confirm that the project activity is not widely observed and commonly carried out in the region.

The project applies the additionality tool version 06. For measures covered in paragraph 6 of the tool, common practice analysis should be carried out in accordance with the requirements of paragraph 47 of the tool. The project falls under the measures listed in paragraph 6 since it involves (b) Switch of technology with or without change of energy source (including energy efficiency improvement as well as use of renewable energies). ERM CVS used its local and sectoral expertise to assess compliance with the common practice requirements of the tool for the demonstration and assessment of additionality, paragraph 47. The tool requires the following:

Step 1: Calculate applicable output range as +/-50% of the design output or capacity of the proposed project activity.

Step 2: In the applicable geographical area, identify all plants that deliver the same output or capacity, within the applicable output range calculated in Step 1, as the proposed project activity and have started commercial operation before the start date of the project. Note their number Nall. Registered CDM project activities and projects activities undergoing validation shall not be included in this step;

Step 3: Within plants identified in Step 2, identify those that apply technologies different that the technology applied in the proposed project activity. Note their number Ndiff.

Step 4: Calculate factor $F = 1 - N_{diff}/N_{all}$ representing the share of plants using technology similar to the technology used in the proposed project activity in all plants that deliver the same output or capacity as the proposed project activity.

The proposed project activity is a "common practice" within a sector in the applicable geographical area if both the following conditions are fulfilled:

(a) the factor F is greater than 0.2, and

(b) $N_{all} - N_{diff}$ is greater than 3.

Consideration of whether the project activity is 'first-of-its-kind'

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
7.5.1	Is the proposed project activity described a 'first of its kind'? If so, does the project comply with the 'Guidelines on additionality of first-of-its-kind'	The project is not described as first of its kind.	OK	OK

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
	project activities'?			

Geographical scope of the common practice analysis

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
7.5.2	<p>Is the applicable geographical area of the common practice analysis appropriate for the assessment related to the project activity's technology or industry type?</p> <p>If a region other than the host country is chosen, is this appropriate?</p>	<p>The geographical scope of the analysis (i.e. the defined region) is determined as the host country i.e. Morocco. This is considered appropriate for the project type and industry because investment and regulatory conditions vary significantly from country to country.</p>	OK	OK

Comparison with similar and operational projects

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
7.5.3	<p>In the applicable geographical area, has the PP identified all plants that deliver the same output or capacity, within the applicable output range, that started commercial operation before the starting date of the project?</p> <p>How have we validated the data sources, including that the list includes all relevant plants?</p>	<p>The PP has not clearly defined the applicable output range or identified all plants that deliver the same output or capacity, within the applicable output range, that started commercial operation before the starting date of the project – please see CAR 03</p> <p>The common practice analysis was updated. The requirements of paragraph 47 of the tool are now followed, and are provided in addition to the earlier analysis. This is considered acceptable.</p> <p>The applicable output range is correctly defined as +/-50% of the installed capacity (60-180MW).</p> <p>The PP has identified all plants that deliver the same output or capacity, within the applicable output range, that started commercial operation before the starting date of the project (Nall). 10 projects are identified. The data used in the common practice analysis has been confirmed by reviewing the official grid data provided by ONEE /12/13/. In accordance with the tool, registered CDM project activities and project activities undergoing validation are not included in this step. Therefore the Tanger Wind Farm (CDM project number 4876), Essaouira wind power project (CDM project number 0030) and Akhfennir Wind Farm Project (CDM project number 4834) have been excluded. This was confirmed by review of the publicly available information on the CDM website.</p> <p>CAR 03 was closed</p>	CAR-03	OK
	Has the PP correctly identified those plants that apply technologies different than the technology applied in the proposed project activity?	<p>No – please see CAR 03</p> <p>The common practice analysis was updated. Within plants identified in Step 2, the PP has identified those that apply technologies different than the technology applied in the proposed project activity (Ndiff). All 10 projects apply different technology as none of them are wind plants. The data used in the common practice analysis has been confirmed by reviewing the official grid data provided</p>	CAR-03	OK

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
		by ONEE /12/13/. CAR 03 was closed		
	Has the PP correctly calculated the factor F, in accordance with the requirements of the tool? Is the project activity common practice (The proposed project activity is a common practice within a sector in the applicable geographical area if both the following conditions are fulfilled: (a) the factor F is greater than 0.2, and (b) Nall-Ndiff is greater than 3)?	To be confirmed based on the resolution of CAR 03 The PP has calculated factor $F = 1 - N_{diff}/N_{all}$ representing the share of plants using technology similar to the technology used in the proposed project activity in all plants that deliver the same output or capacity as the proposed project activity. Because $N_{diff} = N_{all}$, $F = 0$. The proposed project is therefore not a common practice. The analysis has been cross checked against the official data on all grid connected projects in Morocco published by ONEE /12/13/, and found to be consistent. CAR 03 was closed.	CAR-03	OK
	Has the PP provided documented evidence and, where relevant, quantitative information to support the analysis?	Sufficient documentary evidence has not been provided to support the common practice analysis – please see CAR 03 The common practice was revised and official government data was provided on all electricity generation plants in the host country to substantiate the analysis: The analysis has been cross checked against the official data on all grid connected projects in Morocco published by ONEE /12/13/, and found to be consistent. CAR 03 was closed.	CAR-03	OK

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
7.5.4	Overall, has it been demonstrated that the proposed CDM project activity is not common practice?	To be confirmed based on the resolution of CAR 03 The common practice analysis was updated and official government data was provided on all electricity generation plants in the host country to substantiate the analysis: The analysis has been cross checked against the official data on all grid connected projects in Morocco published by ONEE /12/13/, and found to be consistent. CAR 03 was closed. It has been clearly demonstrated and substantiated that the proposed CDM project activity is not common practice.	CAR-03	OK

Common Practice Conclusion

The proposed project is not claimed to be the first-of-its kind, therefore common practice analysis has been carried out as a credibility check to compliment the demonstration of additionality to confirm that the project activity is not widely observed and commonly carried out in the region. ERM CVS has validated that:

- (a) The geographical scope of the common practice analysis is justified;
- (b) An assessment of the existence of similar projects has been undertaken by the PPs and validated by ERM CVS;

(c) The project is not common practice according to paragraph 47 of the additionality tool.

8. Validation Findings - Monitoring plan and other issues

ERM CVS evaluated the monitoring plan for the proposed project to ensure that it is based on the approved monitoring methodology that has been applied. As per the VVM, ERM CVS applied a two-step process, based on review of the documented procedures, interviews with relevant personnel, project plans and any physical inspection, to assess:

- a) *Compliance of the monitoring plan with the approved methodology:*
 - (i) By means of document review, identify the list of parameters required by the selected approved methodology;
 - (ii) Confirm that the monitoring plan contains all necessary parameters, that they are clearly described and that the means of monitoring described in the plan complies with the requirements of the methodology.
- b) *The Implementation of the monitoring plan, taking into account:*
 - (i) Whether the monitoring arrangements described in the monitoring plan are feasible within the project design;
 - (ii) Whether the means of implementation of the monitoring plan, including the data management and quality assurance and quality control procedures, are sufficient to ensure that the emission reductions achieved by/resulting from the proposed CDM project activity can be reported ex post and verified.

Compliance of the monitoring plan with the approved methodology

The monitoring plan in the PDD includes all parameters necessary for monitoring of this type of project in accordance with the approved methodology that has been applied for this project. The parameters are clearly described and the means of monitoring described in the plan complies with the requirements of the methodology.

Completeness of monitoring parameters

The monitoring parameters required by the methodology and applicable tools are:

Parameter Name	Parameter Description	Is the parameter appropriately included in the Monitoring Plan? (including justification and substantiation of information, data and evidence)
EG _{facility,y}	Quantity of net electricity generation supplied by the project plant/unit to the grid in year y	Yes. The GSP_PDD also included an additional parameter: EP _y , Electricity supplied by the grid consumed in the site boundary, which was not required by the methodology. CL 02 was raised.

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
8.1.1	Are all required parameters included in the monitoring plan?	Yes	OK	OK

The remaining parameters listed in the methodology are not relevant for wind projects. The grid emissions factor is determined ex-ante therefore parameters related to the grid emissions factor are also not relevant for the project.

Conclusion

The monitored parameters included in the monitoring are complete and appropriate for monitoring of this project activity.

Compliance of monitoring

For each parameter, ERM CVS has validated whether it has been addressed in accordance with the baseline and monitoring methodology.

Monitored Parameters	EG _{facility,y}
Parameter Description correct?	Yes
Description in line with methodology?	The parameter is described as "Electricity supplied by the Project activity to the grid". The meaning is clear and in line with the methodology.
Data unit correctly expressed?	Yes
Source clearly referenced?	Yes
Correct value provided for ex ante estimation?	Yes /10/
Has this value been verified?	The wind resource study /10/ was reviewed
Measurement method correctly described?	Yes
Measurement and recording frequency correctly described?	Yes
Correct reference to standards?	Yes
Indication of accuracy provided?	Yes
QA/QC procedures described?	Yes
QA/QC procedures appropriate?	Yes

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
8.2.2	Are all required parameters appropriately monitored in accordance with the methodology (including applicable tools)?	<p>Parameter EG_{facility,y} is appropriately monitored in accordance with the methodology, however please refer to CL 02 for clarification related to parameter EP_y.</p> <p>Parameter EP_y was removed from the monitoring plan. CL02 was closed.</p> <p>All required parameters are appropriately monitored in accordance with the methodology (including applicable tools).</p>	CL-02	OK

Conclusion

The means of monitoring all relevant monitored parameters complies with the requirements of the methodology, including applicable tools.

Implementation of the monitoring plan

ERM CVS evaluated the feasibility and sufficiency of the monitoring plan. The key components of the monitoring plan are as follows.

Operational and management structure:

The PDD contains a diagram illustrating the organisational structure to be implemented in order to monitor the project activity. A wind plant manager will be in overall charge of the monitoring system and there will be separate roles for monitoring and auditing, in order to carry out the monitoring plan.

The measurement methods, recording procedures, meter maintenance and trouble-shooting procedures described in the monitoring plan are considered standard good practice for a project of this type in the host country, based on ERM CVS's local and sectoral knowledge and interviews with the project developer. No difficulties are anticipated in implementing the operational and management structure or the monitoring plan as a whole.

Equipment:

Two bidirectional meters, namely a main meter and a back-up meter, will be installed at each step-up transformer stations, allowing simultaneous monitoring of electricity supplied to the grid and the electricity imported from the grid.

The accuracy of the meters is stated to be 0.2s in the monitoring plan. The plan states that equipment installation and metering will be in accordance with to the International Electro technical Commission (IEC) and ONEE standards. The electricity meters will be installed and sealed by ONEE and will be calibrated at least annually by ONEE according to its official maintenance and calibration procedures. The electricity meters will remain the property of ONEE. The equipment setup is considered sufficient to allow for ex-post monitoring of the emission reductions.

Quality Assurance and Quality Control (QA/QC) of equipment and data:

The plan describes that the meters may be inspected at any reasonable time by ONEE on the project participant's request. If, during any test, the accuracy of the meters fails to meet the standards specified by the International Electrotechnical Commission, ONEE shall repair, recalibrate or replace the meters if necessary. If the error of the main meter is out of the permissible limits or if the main meter is malfunctioning, the data of the backup meter will be referenced.

The plan further describes that meters will be jointly inspected, sealed or calibrated on behalf of the parties concerned and shall not be interfered with by either party, except in the presence of the other party or its accredited representatives.

Data will be transferred electronically to UPC's monitoring computer and backed up in electronic and paper copy. The monitoring plan includes provisions for internal audits, including regular site audits, as well as provisions for training. The monitoring procedures will be defined in a monitoring manual that will be updated regularly.

All the data will be archived until two years after the end of the crediting period, or the last issuance of CERs, whichever is later.

The PDD contains sufficient description on how quality will be controlled and assured in the monitoring of emission reductions.

Feasibility of the monitoring plan:

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
8.2.3	Are the arrangements described in the plan feasible and practical within the project design? Please consider: (a) operational and management structure,	Based on ERM CVS's local and sectoral knowledge and by interviewing representatives of the project developer on site, ERM CVS can confirm that the operational and organisational structure is considered sufficient to fulfil the monitoring requirements of the methodology and to ensure that emission reductions can be verified The equipment setup is considered sufficient to carry out the monitoring	OK	OK

	including responsibilities	requirements of the methodology, and the appropriate national standards have been followed. Calibration and maintenance plans are appropriate.		
	(b) Plans for maintenance and calibration of equipment	The data management procedures are considered appropriate to fulfil the monitoring requirements of the methodology and to ensure that emission reductions can be verified.		
	(c) Plans for QA/QC of equipment and data			
	(d) Installation of monitoring equipment (whether in place, or planned)			

Conclusion

Based on the validation activities performed, ERM CVS concludes that:

- (a) The monitoring plan is fully in compliance with the requirements of the methodology;
- (b) The monitoring arrangements described in the monitoring plan are feasible within the project design;
- (c) The means of implementation of the monitoring plan, including the data management and quality assurance and quality control procedures, are sufficient to ensure that the emission reductions achieved by/resulting from the proposed CDM project activity can be reported ex post and verified.

The assessment conducted by ERM CVS is by means of review of the documented procedures, interviews with relevant personnel, project plans and physical inspections of the proposed CDM project activity site.

9. Validation Findings – Sustainable Development, Local Stakeholder Consultation and Environmental Impact

Sustainable Development

As per VVM section 8, ERM CVS evaluated whether the letter of approval by the DNA of the host Party confirms the contribution of the proposed CDM project activity to the sustainable development of the host Party.

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
9.1.1	Does the LOA from the Host Party confirm that the project activity contributes to the sustainable development of that country?	To be confirmed once the LoA is provided. Please see CAR 1 The LoA was provided and confirms that the project activity contributes to the sustainable development of that country. CAR 01 was closed.	CAR-1	OK

Local Stakeholder Consultation

As per VVM section 9, ERM CVS evaluated whether local stakeholders had been invited to comment on the on the proposed CDM project activity prior to the publication of the PDD on the UNFCCC website.

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
9.2.1	Have comments from local stakeholders that can reasonably be considered relevant been invited prior to the publication of the PDD on the UNFCCC website?	Yes. A local stakeholder meeting was carried out on 02 February 2012. Invitation letters were also sent to identified stakeholders /20/. In addition there was an opportunity for consultation associated with the EIA - this was publicised by means of an advertisement in a local newspaper /11/.	OK	OK
	Is the summary of comments received as provided in the PDD complete?	ERM CVS has reviewed the report of the local stakeholder consultation /20/ and confirms that the summary of comments and of responses provided in the PDD is accurate. ERM CVS also interviewed 4 local stakeholders during the site visit to confirm that the details of the stakeholder consultation reported in the PDD are correct, that the stakeholder consultation was adequate and that issues and comments raised during the consultation were addressed adequately by the PPs. Based on the interviews conducted ERM CVS can confirm that relevant stakeholders were properly consulted and the summary of the local stakeholder consultation in the PDD is accurate.	OK	OK
	Has due account been taken of any stakeholder comments received and is this adequately and clearly described in the PDD?	Comments that were raised at the meeting were addressed by the PP and the description in the PDD adequately and clearly describes how the issues were responded to. This has been confirmed by review of the stakeholder consultation report and signed attendance list /20/, and interviews with 4 stakeholders during the site visit as listed in appendix A.	OK	OK

Conclusion

Based on the document reviews undertaken and interviews with local stakeholders, ERM CVS concludes that relevant local stakeholders were invited to comment on the project prior to publication of the PDD on the UNFCCC website, and that the consultation undertaken is adequate in the context of the project. The stakeholders did not identify any serious concerns or significant negative impacts from the construction of the project.

ERM CVS has therefore validated that the local stakeholder consultation is adequate.

Environmental Impacts

As per VVM section 10, ERM CVS evaluated whether an analysis of the environmental impacts of the project activity had been conducted in accordance with paragraph 37(c) of the CDM modalities and procedures.

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
9.3.1	Confirm whether an analysis of the environmental impacts of the project activity has been conducted, including transboundary impacts, and if those impacts are considered significant by the PPs or Host Party?	Yes, an EIA was conducted by Dr. Mohamed DAKKI, from the Rabat Scientific Institute, in April 2011 and has been reviewed by ERM CVS /03/. No transboundary impacts are identified in the EIA. The EIA was approved at the local level by the regional commission of the province of Fahs Anjra and the community of Ksar Sghir on 06 October 2011 and by the National committee of Impact Studies of the Ministry of Environment, on 15 December 2011 /03/. Furthermore, ERM CVS has reviewed the decision of environmental agreement from the Ministry of Energy, Mining, Water and the Environment date 27 July 2012 providing environmental authorisation to the project /60/	OK	OK
	Has the PP conducted an environmental impact assessment if required to do so by the host Party, in accordance with the Party's procedures?	Yes, an EIA was conducted by Dr. Mohamed DAKKI, from the Rabat Scientific Institute, in April 2011 and has been reviewed by ERM CVS /03/. No transboundary impacts are identified in the EIA.	OK	OK

Conclusion

An analysis of environmental impacts of the project has been undertaken /03/. In accordance with procedures required by the host Party, an environmental impact assessment was undertaken /03/.

Public funding

ERM CVS also evaluated whether the information relating to public funding in the PDD Annex 2 has been correctly presented.

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
9.4.1	If the project involves public funding from an Annex 1 country, have the annex 1 parties involved provided an affirmation that such funding does not result in a diversion of official development assistance?	Not applicable. The project does not involve public funding from an annex 1 country. This was confirmed by interviews with the project developer.	OK	OK
	Is the information provided on public funding (PDD, Annex 2) provided in compliance with the actual situation or planning as available by the PPs?	Yes	OK	OK

Conclusion

ERM CVS has confirmed that there is no public funding from Annex 1 countries.

Appendix A: Documents and Interviewees

A.1 DOCUMENT LIST

Reference number	Date	Document Title and version number (if applicable)
01	06 February 2012 26 December 2012	Project Design Document for the proposed project Version 01.1 (for GSP) Version 03.4 (final).
02	Undated	Project site plans: satellite image of project site, and plan of the project site and electricity connection line
03	April 2011 06 October 2011 15 December 2011	Environmental Impact Assessment (EIA) Environmental Impact Assessment for the Project conducted by Dr. Mohamed DAKKI, from the Rabat Scientific Institute Approval of the EIA at the local level by the regional commission of the province of Fahs Anjra and the community of Ksar Sghir Approval memorandum of EIA for the Project by the National committee of Impact Studies of the Ministry of Environment
04	21 February 2012 26 December 2012	IRR calculation spreadsheet Original version (version 01) Final version (version 07)
05	06 February 2012 20 February 2012 26 December 2012	ER calculation spreadsheet Version 01.1 Version 01.2 Version 5
06	10 August 2012	Host Country Letter of approval for the proposed project issued by the Ministry of Energy, Mining, Water and the Environment, as authorised representative of the CDM DNA of the Kingdom of Morocco
07	14 December 2012	Annex-I country Letter of approval for the proposed project issued by The Environment Agency acting as the UK's DNA
08	10 December 2012	Modalities of Communication for the proposed project.
09	25 January 2012	Vestas: Wind Turbine generator purchase agreement (draft)
10	19 November 2011	Annual Estimated Production for 120MW wind farm Khalladi – Morocco (Wind resource study) developed by UPC Renewables
11	20 July 2011	Newspaper advert for the consultation associated with the EIA stating that the project will be open for consultation from 8 August to 02 September 2011
12	13 January 2012 (signature date)	Official letter from ONEE with data on Morocco power plants, consumption and net electricity generation used to calculate the ERs.

Reference number	Date	Document Title and version number (if applicable)
13	16 February 2012 (signature date)	Complementary official letter from ONEE detailing grid information for Tahaddart, Ain Beni Mathar and Jorf Lasfar power plants.
14	04 August 2011	Nareva Holding/Attijari Wafa: Benchmark de centrales électriques au Maroc (Benchmark study for electricity generation projects in Morocco) http://cdm.unfccc.int/filestorage/C/5/X/C5XFQDWN0HBEL86R7VGSTJA21IMKOP/Annex%201.pdf?t=T2N8bHp3N2lifDBgGPwt_pkcV-QQQdbRQ5qb
15	Adopted in March 2010	Law 13.09 (Moroccan renewable energy law)
16	Accessed 22 February 2011	Global Wind Energy Council: Country Profile – Morocco http://www.gwec.net/index.php?id=174
17	Accessed 22 February 2011	Wikipedia – Energy policy of Morocco http://en.wikipedia.org/wiki/Energy_policy_of_Morocco
18	08 November 2010	CMS Legal: Flash info Morocco The new legal framework of the Morocco's renewable energies sector http://www.cmslegal.com/newsmedia/newsletters/newsletterdetail/pages/default.aspx?PublicationGuid=3b75c3eb-bdc7-4cdb-aec0-002f81373b59
19	Accessed 22 February 2012	GTZ: Renewable Energy and Energy Efficiency Promotion in Morocco www.gtz.de/en/weltweit/maghreb-naheer-osten/marokko/26777.htm
20	(a) 04 February 2012 (b) 02 February 2012	(a) Stakeholder consultation report (notes made on 04 February for the consultation meeting that took place on 02 Feb 2012) (b) Stakeholder consultation signed participant's list (from the meeting on 02 February 2012)
21	Accessed 20 February 2012	PDDs and validation reports for previous wind projects registered in Morocco: Akhfennir Wind Farm Project Haouma Wind Farm Project Tanger wind power project Tétouan Wind Farm Project for Lafarge Cement Plant Essaouira wind power project Available on the UNFCCC CDM website http://cdm.unfccc.int
22	Accessed 24 February 2012	UPC renewables Group website www.upcrenewables.com , including a list of projects http://upcnarenewables.com/projects/
23	17 May 2010	Det Norske Veritas (DNV): Type Certificate: Vestas V90 3MW (This certificate certifies the technical specifications and lifetime of the wind turbines)
24	Undated (draft agreement – not yet signed and dated)	OFFICE NATIONAL DE L'ELECTRICITE: 'Convention d'Accès au réseau électrique national de transport Pour le Site de Jbel-Sendouq (Khalladi)' (Draft interconnection agreement with ONEE)
25	15 December 2011	International Finance Corporation: 'Morocco: Khalladi 120MW Wind Farm - IFC Mandate Letter' signed by Syed Gulrez Hoda, Director, IFC Europe, Middle East and North Africa Infrastructure Department
26	06 October 2011	Vestas: Indicative Quotation N°4 SP-31542 for Wind Power Plants in KHALLADI Morocco (22 x V90-3MW HH80m) + (18 x V90-3MW HH65m)
27	Undated	Salamambo Logistics: Quotation for the land transportation of equipment in Morocco. Salamambo logistics is part of the Salamambo Group, headquartered at 56 Rue du Mercure, Z.I. 2013, Ben Arous, Tunis, Tunisia
28	22 December 2011	Salamambo Logistics: Sea freight offer Taranto Port Italy - Tangier Med Morocco Khalladi wind mills Project Morocco
29	Undated. Valid until 03	GCube Underwriting Limited: quotation for insurance cover during the construction period covering erection risks, advanced loss of profits, and international liability –

Reference number	Date	Document Title and version number (if applicable)
	May 2012	construction.
30	Undated	Spreadsheet provided by the PP which gives a very detailed breakdown of all development related fees accrued to date
31	March 2012	Naciri & Associates with Allen & Overy: legal fees quotation for UPC Renewables Jbel-Sendouq wind project
32	29 May 2012	Caleolus: Assessment Report of plant operational costs for the project
33	01 February 2010	Royaume de Maroc (Kingdom of Morocco): Code General des Impots 2010 (general tax code 2010)
34	02 April 2009	Official Bulletin of the Kingdom of Morocco: Revised Tariffs for grid connected electricity generation projects
35	03 June 2012	Caleolus: Assessment report of the proportion of energy sold to OCP and Holcim during each tariff period (HP(rush-hour), SHP (super-peak), HPL (on-peak), HC (off-peak))
36	29 May 2012	Caleolus: Assessment report of the Investment Costs (CAPEX) of the Balance of Plant (i.e. items other than the wind turbines themselves)
37	29 May 2012	Caleolus: Estimate of CAPEX costs for the Khalladi 120 MW Wind Project – Morocco
38	06 October 2011	Bulletin Officiel (official Bulletin of the Kingdom of Morocco), containing Law no. 32-10, supplementing Act No. 15-95, of the 'Code de commerce' (Commercial code)
39	01 June 2012	Garrad Hassan France SARL 'Assessment of the energy production of the proposed El Khalladi Wind Farm in the Kingdom of Morocco'. Prepared for the International Finance Corporation. Document number 120062-FRPR-R-01.
40	Undated	Vestas: Quotation for Balance of Plant (BOP) costs (i.e. additional CAPEX, aside from the cost of the wind turbines themselves) for the proposed project
41	30 January 2012	Sarens Maroc Wind Division: UPC Renewables Khalladi Wind Farm 40 WTG V90 x HH 65 & 80 m Technical & Commercial Offer (quotation for the crane and installation services)
42	20 December 2011	CTE: Proposal/draft agreement for the erection of 40 wind Turbines on Khalladi Wind Farm site, Morocco
43	Undated. Valid until 03 May 2012	GCube Underwriting Limited: quotation for insurance cover for the marine cargo transportation of the equipment
44	16 August 2012	Contract for electricity purchase between Holcim (Maroc) SA and UPC Renewables SA
45	07 March 2012	UPC Renewables: Offer for supply of energy to OCP
46	25 July 2012	Draft agreement between Vestas France SAS and UPC Renewables SARL: SERVICE & AVAILABILITY AGREEMENT (AOM 4000) relating to KHALLADI WIND FARM
47	03 October 2012	GCube Underwriting Limited: Insurance Premium document for the Khalladi Project
48	03 December 2010	Invest in Morocco: Fact Sheet no.13 – Corporate Tax (confirms that the corporate tax rate in Morocco is 30%). Available at the Moroccan Investment Development Agency

Reference number	Date	Document Title and version number (if applicable)
		website (http://www.invest.gov.ma/?lang=en&Id=18)
49	Accessed 01 June 2012	www.XE.com exchange rates website
50	04 November 2011	Global Energie: cost quotation spreadsheet and covering letter indicating costs for the 33 KV Collector System, substation, and transmission line.
51	Accessed 18 November 2012	Attijari Finance Corp website: http://www.attijariwafabank.com/Entreprise/BMI/Pages/CorporateFinancebis.aspx
52	20 February 2007	The World Bank: Project Appraisal Document on a proposed grant from the Global Environment Facility trust fund in the amount of US\$ 43.2 million to the Office Nationale De l'Electricite, for an Intergrated Solar Combined Cycle Power Project. Available: http://www.worldbank.org/projects/P041396/integrated-solar-combined-cycle-power-project?lang=en
53	Accessed 18 November 2012	ONEE: Centrale à cycle combiné de Tahaddart (Report on a combined cycle gas power plant project). http://www.one.org.ma/fr/pdf/tahhadart_Fr.pdf
54	Accessed 18 November 2012	PDD of the Jorf Lasfar heat recovery enhancement for power project http://www.dnv.com/focus/climate_change/Upload/OCP%20PDD.pdf
55	Accessed 18 November 2012	Index Mundi: Inflation Data for Morocco www.indexmundi.com/morocco/inflation_rate_consumer_prices.html
56	2011-2012	Royaume du Maroc: Project d'installation du parc eolien Khalladi: Contrats de location des terrains (land rent contracts, various)
57	19 October 2011	Agreement on direct cooperation for CDM project in Morocco, between ADS Maroc and Ultimate Carbon Trading (North Africa) Limited (CDM consultancy contract)
58	21 November 2011	Notification of prior consideration for the project sent to the CDM Secretariat and to the Moroccan DNA
59	2012	Deloitte: International Tax Report: Morocco Highlights 2012 http://www.deloitte.com/assets/Dcom-Global/Local%20Assets/Documents/Tax/Taxation%20and%20Investment%20Guides/2012/dttl_tax_highlight_2012_Morocco.pdf
60	27 July 2012	Ministry of energy, mining, water and the environment: environmental authorisation for the project

A.2 INTERVIEWS

Reference	Name	Title & Organisation	Main topics discussed
IV1	Omar B. Hassine Bey	General Manager, EnerCiel Tunisie, UPC Group (Project Owner)	Project description, Monitoring, Additionality, Timeline
IV2	Dr Abdelmourhit Lahbabi	President, ADS Maroc (CDM Consultants)	PDD content

IV3	Amine Amraoui	Project Manager, ADS Maroc (CDM Consultants)	PDD content
IV4	Imed Hmaidia	Responsible technique & logistique (responsible for technical issues and logistics), UPC Renewables (project owner)	Project description, site layout, Monitoring, Additionality, Timeline, stakeholder consultation
IV5	Charif Achahbar	Representative of UPC Renewables	Project description, site layout, Monitoring, Additionality, Timeline
IV6	Abdelislam Khayat	President of the rural community of Khmis Anjra	Stakeholder consultation, environmental impacts
IV7	Yasser Ftouh	Representative of the Province Anjra Fahs	Stakeholder consultation, environmental impacts
IV8	Benaissa Msiid	Conseil, Economie de la culture et developpement durable (advisor, economic and cultural issues and sustainable development), Association Targa-AIDE (Moroccan NGO)	Stakeholder consultation, environmental impacts
IV9	Driss Nassou	Journalist, 'La Depeche' newspaper, University Professor	Stakeholder consultation, environmental impacts

Appendix B: Remediation Form

Corrective Action Requests (CARs), Clarification Requests (CLs) and Forward Action Requests (FARs)

Corrective Action Requests	Ref. to Question Number	Summary of PPs' response	Final conclusion
CAR 1: Please provide the letters of approval and modalities of communication.	5.3.1	Clear and accepted	<p>The Host Party LoA has been provided and reviewed by ERM CVS /06/. The LoA confirms:</p> <ul style="list-style-type: none"> Ratification of the Kyoto Protocol: The Kingdom of Morocco ratified the Kyoto Protocol on 03 April 2002 Voluntary Participation Reference to the precise project title in the PDD: The LoA references the project title as "Jbel Sendouq-Khalladi ("Khalladi") wind farm project in Morocco" however the GSP PDD did not include the additional quotation marks [""] within the brackets – the GSP PDD refers to the Project title as "Jbel Sendouq-Khalladi (Khalladi) wind farm project in Morocco". This is a minor change in the project title and does not have any impact on the compliance of the Project activity with the CDM rules or the determination of emission reductions. The title in the PDD and other documents (e.g. financial model) has now been updated to exactly match the title in the LoA. Contribution to sustainable development <p>The Host Party LoA was received from the project participant, but its authenticity is not doubted. The LoA does not include any additional conditions relevant to the CDM validation requirements /06/.</p> <p>During the course of the validation, the Project Participant 'Ultimate Carbon Trading (North Africa) Limited' of Morocco was replaced with 'Ultimate Carbon Trading (North Africa) Limited' in the UK – i.e. the name of entity remained the same but the Party related to this PP was changed. Therefore in the updated PDD, the Annex 1 Party,</p>
	5.3.2	Letter of Approval from Moroccan DNA attached.	
	5.3.3	Letter of Approval from UK DNA attached	
	5.3.4	MOC attached	
	5.4.1		
	9.1.1		

Corrective Action Requests	Ref. to Question Number	Summary of PPs' response	Final conclusion
			<p>The United Kingdom of Great Britain and Northern Ireland, has been added.</p> <p>The Annex 1 LoA has been provided and reviewed by ERM CVS /07/. The LoA authorises Ultimate Carbon Trading (North Africa) Limited to participate in the project, and confirms:</p> <ul style="list-style-type: none"> • Ratification of the Kyoto Protocol: the United Kingdom ratified the Kyoto Protocol on 31st May 2002 • Voluntary Participation • Reference to the precise project title in the PDD: The project title in the UK LoA is the same as that in the host country LoA, the MoC, and the final PDD. <p>The MoC has been provided. The correct form is used and it is signed by all PPs. Contact details are consistent between the PDD and MoC.</p> <p>CAR closed</p>
CAR 02: Please remove CDM related costs from the financial analysis calculations.	7.3.2 7.3.3	<p>Clear and accepted</p> <p>CDM related costs are now removed from the financial analysis calculations. A new version of the financial has been provided.</p>	<p>The revised financial analysis model has been reviewed by ERM CVS. CDM related costs have been removed from the calculations, since the analysis is supposed to assess the situation of the project in the absence of CDM financing.</p> <p>CAR closed</p>
CAR 03: The common practice is not carried out in accordance with the latest version of the additionality tool. Please revise the PDD, and provide sufficient evidence to substantiate the analysis.	7.5	<p>Clear and accepted</p> <p>The common practice analysis is now done in the new version of the PDD according to para 47 of the additionality tool.</p> <p>As for the list of power plants with a capacity within the applicable output range 50% of the design capacity of the proposed</p>	<p>The common practice analysis in the PDD has been revised. The requirements of paragraph 47 of the tool are now followed, and are provided in addition to the earlier analysis. This is considered acceptable.</p> <p>The applicable output range is correctly defined as +/-50% of the installed capacity (60-180MW).</p> <p>The PP has identified all plants that deliver the same output or capacity, within the applicable output range, that started commercial operation before the starting date of</p>

Corrective Action Requests	Ref. to Question Number	Summary of PPs' response	Final conclusion
		<p>project activity, it is derived from the ONEE official data already transmitted to the DOE.</p> <p>Moreover, registered CDM project activities, project activities undergoing validation and project activities in Morocco that are considering the CDM and that provided notification to the UNFCCC are available at the UNFCCC website.</p>	<p>the project (Nall). 10 projects are identified. The data used in the common practice analysis has been confirmed by reviewing the official grid data provided by ONEE /12/13/. In accordance with the tool, registered CDM project activities and project activities undergoing validation are not included in this step. Therefore the Tanger Wind Farm (CDM project number 4876), Essaouira wind power project (CDM project number 0030) and Akhfennir Wind Farm Project (CDM project number 4834) have been excluded. This was confirmed by review of the publicly available information on the CDM website.</p> <p>Within plants identified in Step 2, the PP has identified those that apply technologies different than the technology applied in the proposed project activity (Ndiff). All 10 projects apply different technology as none of them are wind plants.</p> <p>The PP has calculated factor $F = 1 - \text{Ndiff}/\text{Nall}$ representing the share of plants using technology similar to the technology used in the proposed project activity in all plants that deliver the same output or capacity as the proposed project activity. Because $\text{Ndiff} = \text{Nall}$, $F = 0$.</p> <p>The proposed project is therefore not a common practice.</p> <p>The analysis has been cross checked against the official data on all grid connected projects in Morocco published by ONEE /12/13/, and found to be consistent.</p> <p>CAR closed</p>
CAR 04: A project IRR has been used. However finance related expenditure is included in the net cash flow, please amend the analysis accordingly.	7.3.12 7.3.3	<p>Clear and accepted</p> <p>The financial analysis has been amended accordingly. A new version of the financial model has been provided.</p>	<p>A new version of the financial analysis has been provided by the PP and reviewed by ERM CVS. Finance related expenditure has been removed from the cash flow. The investment analysis is now in line with the 'Guidelines on the assessment of investment analysis' version 05.</p> <p>CAR closed</p>
CAR 05: Please include the sensitivity analysis in the	7.3.14	<p>Clear and accepted</p> <p>The sensitivity analysis has been included</p>	<p>Traceable sensitivity analysis calculations have now been included in the investment analysis spreadsheet. The sensitivity analysis is validated in detail in section 7.3 of</p>

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Corrective Action Requests	Ref. to Question Number	Summary of PPs' response	Final conclusion
financial analysis spreadsheet.	7.3.3	in the new version of the financial analysis spreadsheet.	this report. CAR closed

Clarification Requests	Ref. to Question Number	Summary of PPs' response	Final conclusion
CL 1:	5.6.1	Clear and accepted	(a) The lifetime of the wind turbines has been stated in the PDD section A.4.3. The lifetime is 20 years, and this has been validated against a certificate from Det Norske Veritas (DNV) certifying the technical specifications of the wind turbine /23/.
(a) The lifetime of the wind turbine equipment is not stated in section A.4.3 of the PDD. Please revise the PDD and provide relevant evidence to support the value.	5.5.1	(a) Lifetime of the wind turbine of 20 years is now stated in section A.4.3. Evidence is attached.	(b) Monitoring equipment and its location has been stated in the revised PDD section A.4.3. This has been validated to be consistent with the monitoring plan and in line with the monitoring requirements of the applied methodology.
(b) Monitoring equipment and its location is not mentioned in section A.4.3 of the PDD – please revise the PDD.	5.6.4	(b) Monitoring equipment description and diagram has been included in the PDD accordingly	(c) A footnote has been added to the PDD to describe the expected line loss. The line loss rate cannot exceed 3%, as stipulated in the draft interconnection agreement with ONEE /24/. ERM CVS has reviewed the document and confirmed that this is an official and reputable third party source.
(c) The line loss value is not explained explicitly in the PDD and a reference to support the	5.6.5	(c) The line loss value will be explained in the PDD. The draft interconnection agreement will be provided to the DOE as a source to support the value	(d) ERM CVS has reviewed an official document from the International Finance Corporation that is expected to provide debt financing to the project /25/. The document is a mandate letter i.e. it is offering to provide financing to the project on the basis of an application that was submitted by the project developer. The
		(d) The mandate letter from IFC	

Clarification Requests	Ref. to Question Number	Summary of PPs' response	Final conclusion
<p>value has not been provided. Please revise the PDD and provide relevant evidence.</p> <p>(d) Please provide evidence to support the estimated net electricity generation, and in doing so please justify the selection of the P90 (probability of 90%) scenario to determine the estimated net expected electricity generation.</p>		<p>which was based on financial projections using a P90 case is attached.</p>	<p>document can therefore be considered a reliable and authoritative source. The document confirms the expected net electricity generation of the project and demonstrates that the debt financial institution, the IFC, made the decision in principle to lend to the project on the basis of the P90 (probability of 90%) scenario for electricity generation. It therefore confirms that the P90 scenario is used by the lender and is the basis of the decision to go ahead with the project, and should therefore be the basis of the financial analysis.</p> <p>CL closed</p>
<p>CL 02: For parameter EPy (Electricity supplied by the grid consumed in the site boundary):</p> <p>(a) the PDD describes that readings will be measured hourly. This is not consistent with EG_{facility,y}.</p> <p>(b) The PDD does not include reference to any standards for parameter EPy.</p> <p>(c) No indication of accuracy is provided for parameter EPy.</p> <p>Please revise the PDD to include the relevant information.</p>	8.2.2	<p>Clear and accepted</p> <p>Since parameter EG_{facility,y} is the quantity of net electricity generation supplied by the project activity to the grid there is no need for the parameter EPy. In fact, the four bidirectional electricity meters (see description of the monitoring plan in section B.7.2 subsection c) measure the net electricity export to the national grid (gross electricity export to the grid minus the electricity imports for the use of the wind farm auxiliaries)</p> <p>Moreover there is no reference of EPy parameter in the applied methodology.</p> <p>Therefore parameter EPy has been deleted from PDD and the latter has been updated accordingly.</p>	<p>Parameter EPy has been removed from the monitoring plan as it was not required by the methodology and is not needed for the monitoring of the proposed project activity.</p> <p>CL closed</p>
<p>CL 3: Please substantiate the appropriateness of the</p>	7.3.2	<p>Clear and accepted</p> <p>The data sources used in the development</p>	<p>ERM CVS concluded that the benchmark study was used due to the lack of official government benchmarks or other publicly available and reliable benchmarks in the host country. ERM CVS confirmed that the report was developed based on publicly available</p>

Clarification Requests	Ref. to Question Number	Summary of PPs' response	Final conclusion
benchmark.		<p>of the benchmark are stated in the PDD in Section B.5 page 13 as follows: <i>"The benchmark IRR is based on the benchmark study on power plants in Morocco that was conducted for the CDM registered projects of Haouma Wind Farm Project (Ref 4827) and the Akhfennir Wind Farm Project (Ref 4834) both developed by Nareva Holding."</i></p> <p>In addition, the benchmark study that is publicly available on the UNFCCC website (link stated in the PDD) will be forwarded to the DOE.</p> <p>New evidence has been provided on the detailed study of Moroccan investment Bank Attijari Finances Corp on the benchmark establishment for the power sector in Morocco. This study was commissioned by Nareva for its wind farm project (registered CDM project N°4827) in the absence of <i>public available benchmarks in Morocco for power generation projects</i> (See attached extracts from the Haouma validation report). Six projects has been analyzed in this study :</p> <ol style="list-style-type: none"> 1) The company Jorf Lasfar Energy Company (JLEC); 2) The wind farm "Al Al Koudia Baida" (CED); 3) The combined cycle plant of Tahaddart (EET), 4) The wind park in Essaouira; 5) Solar thermal plant of Ain Beni Mathar. 6) Lafarge's Tétouan Wind Farm. <p>The study concludes that <i>the project IRR of</i></p>	<p>data sources, inter alia the World Bank /52/, ONEE /53/, the OMPIC (Office Marocain de la Propriete Industrielle et Commerciale - Moroccan office of industrial and commercial enterprises) and information published on the UNFCCC website /21/ inter alia for the Essaouira wind power project (#0030), Tétouan wind farm project for Lafarge cement plant (#0042), and Wind farm extension project for Lafarge's cement plant in Tétouan (not registered). The underlying data used to develop the benchmark study includes all available wind investments in the country, and therefore is based on parameters that are standard in the market.</p> <p>ERM CVS concluded that the assumptions underlying the referenced benchmark or discount rate are relevant to the sector. ERM CVS was able to cross check a sample of the data sources used to determine the benchmark: a detailed explanation of the IRR calculations used to support the study is provided for two projects: CED wind farm and Ain Beni Methar solar thermal plant /14/, and information on the IRR of the Essaouira project and the Jorf Lasfar project is available on the UNFCCC website /21/54/.</p> <p>ERM CVS confirmed that the same benchmark is used by 2 other registered CDM wind farm projects in Morocco, Akhfennir Wind Farm Project and Haouma Wind Farm Project /21/.</p> <p>The report concluded that the benchmark rate of return for wind projects in Morocco should be 12-14%, and the PP has chosen the most conservative end of this range.</p> <p>The benchmark is validated in further detail in section 7 of the validation report.</p> <p>CL closed</p>

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Clarification Requests	Ref. to Question Number	Summary of PPs' response	Final conclusion
		<p><i>a private developer of wind energy projects in Morocco should be between 12% and 14%.</i></p> <p>Accordingly, using a 12% as after tax project IRR benchmark for wind farms projects in Morocco is deemed conservative.</p>	
CL 04: Please provide evidence sources / documents for all the input values to the financial analysis.	7.3	Further evidence has been provided to support all the input values in the investment analysis, and these are listed in the 'data book' sheet of the investment analysis spreadsheet.	<p>ERM CVS has validated the input values to the financial analysis directly against the quotations, expert assessments, contracts and official documents that were used as the sources of the values. Because the project has not yet started construction at the time of validation, actual contracted values were not available for all sources, but the values have been cross checked against reliable and authoritative sources. All input values used in the investment analysis are found to be consistent with the referenced sources. The input values are validated in detail in section 7.3 of this report.</p> <p>CL closed</p>
CL 05: Please provide additional evidence to justify the contingency (5% of total investment including finance charges) included in the development fee in the financial analysis.	7.3.3	<p>Clear and accepted</p> <p>The 5% figure was amended on expert opinion and was replaced with a contingency of 3% on the balance of plant only. This was confirmed by written confirmation by Caleolus – a third party independent consultant – document of which has been provided to the DOE.</p>	<p>The rate of contingency has been revised to 3% based on an independent third party expert opinion statement /34/. The 3% rate of contingency is in line with the expert opinion /34/ and is reasonable based on ERM CVS's sectoral and financial knowledge.</p> <p>CL closed</p>
CL 06: Please provide evidence of standard payment terms for debtors and creditors	7.3.3	<p>Clear and accepted</p> <p>Financial model now changed to 90 day creditor/debtor terms according the Moroccan law N°32-10.</p>	ERM CVS has reviewed Article 78.2 of Law no. 32-10, supplementing Act No. 15-95, of the Commercial Code, published in the Official Bulletin of the Kingdom of Morocco, 06 October 2011 /38/ and confirmed that the standard payment terms for creditors and debtors is 90 days. However this is no longer relevant as working capital is no longer

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Clarification Requests	Ref. to Question Number	Summary of PPs' response	Final conclusion
		Moroccan law is provided: See Article 78.2, page 33/104 of the PDF file : "p33_BO_5984_LOI 32-10 DELAI DE PAIEMENT.pdf".	included in the investment analysis. CL closed
CL 07: No residual value is included in the analysis. Please provide evidence supporting this assumption	7.3.4	Clear and accepted There should not be any residual value as the financial analysis period (20 years) is greater than the amortization period (10 years).	The assessment period is consistent with the technical lifetime of the project activity and the project assets are fully depreciated during the assessment period. No residual value is therefore included in the investment analysis, which is consistent with the 'Guidelines on the assessment of investment analysis'. CL closed
CL 08: Please provide source documents supporting the depreciation rates.	7.3.4	Clear and accepted Financial model t provided using a depreciation rate of 10 years throughout as per Morocco's tax code. This document has been provided.	The depreciation rate has been validated against the tax code of Morocco /33/ which stipulates that a 10% annual rate should be used, i.e. straight line depreciation over 10 years. CL closed
CL 09: (a) Please clarify the debt / equity ratio for the proposed project, with evidence (b) Please provide source documents supporting the loan terms	7.3.12	Clear and accepted IFC mandate letter showing relevant debt/equity ratio and loan terms is provided. A further financial analysis providing the assumed debt arrangements has been provided showing the Project Participants assessed likely debt:equity ratio. The project has not reached financial close, so the debt:equity ratio is not 100% fixed so can only be provided on a best assessment basis. This has further been used to provide an equity IRR for the project.	The IFC mandate letter /25/ stipulates the maximum debt:equity ratio, however the loan is not finally agreed yet. The debt equity ratio applied in the proposed project is therefore the ratio expected by the PPs. The ratio is considered reasonable based on ERM CVS's sectoral and financial knowledge. All loan terms are referenced to the IFC mandate letter and are found to be consistent. CL closed

In addition some editorial and minor changes to the PDD were made by the PP that had no relevance on compliance with CDM requirements.

Forward Action Requests	Ref. to Section Number	Summary of PP's response	Final conclusion
None			