



POA VALIDATION REPORT

First Solar PoA in India by SENES Consultants in India

REPORT No. 2010-0593

REVISION No. 04

DET NORSKE VERITAS



POA VALIDATION REPORT

DNV CLIMATE CHANGE
SERVICES AS

Veritasveien 1,
1322 HØVIK, Norway
Tel: +47 67 57 99 00
Fax: +47 67 57 99 11
http://www.dnv.com
Org. No: NO 994 774 352 MVA

Date of first issue: 7 March 2011	Project No.: PRJC-283026-2010-CCS-IND
Approved by Ole A. Flagstad	Organisational unit: DNV Climate Change and Environmental Services
Client: SENES Consultants India Private Limited	Client ref.: Mr. Mainak Hazra

Title of PoA: First Solar PoA in India by SENES Consultants

Host country: India

Methodology: AMS-I.D

Version: 16

GHG reducing Measure/Technology: Renewable energy generation from solar power
(Sectoral Scope 1)

ER estimate: 159 334 tCO₂e over a 7 year renewable crediting period equivalent to 22 762 tCO₂e per annum.

Size

☐ Large Scale ☒ Small Scale

Validation Phases:

☒ Desk Review

☒ Follow up interviews

☒ Resolution of outstanding issues

Validation Status

☐ Corrective Actions Requested

☐ Clarifications Requested

☒ Full Approval and submission for registration

☐ Negative validation opinion

In summary, it is DNV's opinion that the First Solar PoA in India by SENES Consultants in India, as described in the PoA-DD of 9 March 2012 meets all relevant UNFCCC requirements for the CDM and correctly applies the baseline and monitoring methodology AMS-I.D, version 16. DNV Climate Change Services AS (DNV) thus requests the registration of the programme as a CDM Programme of Activities.

Report No.: 2010-0593	Date of this revision: 23 March 2012	Rev. No. 04
Report title: First Solar PoA in India by SENES Consultants in India		
Work carried out by: Nitin Kapoor, GN Agrawal		
Work verified by: Simon Wong Yon-Sing		

Key words:

Programme of Activities (PoA)

Clean Development Mechanism (CDM)

Climate Change

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

☐ Limited distribution

☐ Unrestricted distribution



POA VALIDATION REPORT

Abbreviations

AVVNL	Ajmer Vidyut Vitran Nigam Limited
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEF	Carbon Emission Factor
CER	Certified Emission Reduction
CERC	Central Electricity Regulatory Commission
CH ₄	Methane
CL	Clarification request
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
CDM-CPA-DD	CDM programme activity design document
CDM-PoA-DD	CDM programme of activities design document
CPA	CDM programme activity
DNA	Designated National Authority
DNV	Det Norske Veritas
EIA	Environment Impact Assessment
EPC	Engineering, Procurement and Construction
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
IEX	Indian Energy Exchange
IPCC	Intergovernmental Panel on Climate Change
JdVVNL	Jodhpur Vidyut Vitran Nigam Limited
JNNSM	Jawaharlal Nehru National Solar Mission
JVVNL	Jaipur Vidyut Vitran Nigam Limited
MP	Monitoring Plan
NGO	Non-governmental Organisation
NPV	Net Present Value
ODA	Official Development Assistance
PDD	Project Design Document
PLR	Prime Lending Rate
PoA	Programme of activities
SBI	State Bank of India
SPV	Solar Photo Voltaic
UNFCCC	United Nations Framework Convention on Climate Change
UPCL	Uttarakhand Power Corporation Limited
WPI	Wholesale Price Index



POA VALIDATION REPORT

TABLE OF CONTENTS

1	EXECUTIVE SUMMARY – VALIDATION OPINION	1
2	INTRODUCTION	2
2.1	Objective	2
2.2	Scope	2
3	METHODOLOGY	3
3.1	Desk review of the programme design documentation	3
3.2	Follow-up Interviews with Programme Stakeholders	7
3.3	Resolution of outstanding issues	9
3.4	Internal quality control	11
3.5	Validation team	11
4	VALIDATION FINDINGS	12
4.1	Participation requirements	12
4.2	Programme design	12
4.3	Criteria for inclusion of CDM Programme Activities	13
4.4	Operational, management and verification plan	14
4.5	Baseline identification	15
4.6	Additionality	17
4.7	Monitoring plan	21
4.8	Environmental impacts	25
4.9	Comments by local stakeholders	25
4.10	Comments by Parties, stakeholders and NGOs	26
Appendix A: Validation Protocol		
Appendix B: Protocol for Assessing Compliance of Specific CDM Programme Activities with the Programme of Activities		
Appendix C: Curricula vitae of the validation team members		



POA VALIDATION REPORT

1 EXECUTIVE SUMMARY – VALIDATION OPINION

DNV Climate Change Services AS (DNV) has performed a validation of the small-scale programme of activity (PoA) titled “First Solar PoA in India by SENES Consultants” in India and the PoA specific CDM-SSC-CPA-DD with generic information relevant to all CDM programme activities (CPAs) to be included in this PoA.

The validation was performed on the basis of UNFCCC criteria for programme of activities under the Clean Development Mechanism (CDM) and host Party criteria, as well as criteria given to provide for consistent programme operations, monitoring and reporting.

The review of the programme design documentation and the subsequent follow-up interviews have provided DNV with sufficient evidence to determine the fulfilment of stated criteria.

The host Party is India and there is no Annex I Party has been identified as yet. The host Party India fulfills the participation criteria and has approved the programme and authorized the project participant on 20 September 2011. The DNA from India confirmed that the programme assists in achieving sustainable development.

The programme correctly applies AMS-I.D “Grid Connected renewable energy generation”, version 16.

The programme utilizes solar power to produce renewable energy in the form of electricity and supplies to the grid which results in reductions of CO₂ emissions that are real, measurable and give long-term benefits to the mitigation of climate change. It is demonstrated that the programme is not a likely baseline scenario. Emission reductions attributable to the programme are hence additional to any that would occur in the absence of the programme of activity.

The total emission reductions from the project activity (first CPA) are estimated to be on the average 22 762 tCO₂e per year over the selected renewable 7 years crediting period. The emission reduction forecast has been checked and it is deemed likely that the stated amount is achieved given that the underlying assumptions do not change.

Adequate training and monitoring procedures have been described.

In summary, it is DNV’s opinion that the PoA titled “First Solar PoA in India by SENES Consultants” in India, as described in the CDM-SSC-PoA-DD of 9 March 2012, meets all relevant UNFCCC requirements for a PoA under the CDM and all relevant host Party criteria and correctly applies the baseline and monitoring methodology AMS-I.D, version 16. DNV thus requests the registration of the PoA titled “First Solar PoA in India by SENES Consultants” as a PoA under the CDM.

New Delhi and Oslo 23 March 2012

Nitin Kapoor
CDM Validator
DNV New Delhi, India

Ole A. Flagstad
Approver,
DNV Climate Change Services AS



POA VALIDATION REPORT

2 INTRODUCTION

SENES Consultants India Private Limited has commissioned DNV Climate Change Services AS (DNV) to perform a validation of the small-scale CDM Programme of Activities (PoA) with the title “First Solar PoA in India by SENES Consultants” in India (hereafter called “the PoA”). This report summarises the findings of the validation of the PoA and the PoA specific small-scale CDM programme activities Design Document (CDM-SSC-CPA-DD) with generic information relevant to all CDM programme activities (CPAs) to be included in this PoA. The validation was performed on the basis of UNFCCC criteria for the PoAs under the CDM, as well as criteria given to provide for consistent programme operations, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM modalities and procedures, the simplified modalities and procedures for small-scale CDM project activities, the procedures for registration of a programme of activities and the subsequent decisions by the CDM Executive Board.

2.1 Objective

The purpose of a validation is to have an independent third party assess the small-scale PoA design document (CDM-SSC-PoA-DD) and the PoA specific CDM-SSC-CPA-DD with generic information relevant to all CPAs to be included in this PoA. In particular, the eligibility criteria for inclusion and demonstration of additionality of CPAs, the programme's baseline determination, monitoring plan, and the programme's compliance with relevant UNFCCC and host Party criteria are validated in order to confirm that the programme design, as documented, is sound and reasonable and meets the identified criteria. Validation is a requirement for all CDM PoAs and is seen as necessary to provide assurance to stakeholders of the quality of the programme and its intended generation of certified emission reductions (CERs).

2.2 Scope

The validation scope is defined as an independent and objective review of the CDM-SSC-PoA-DD and the PoA specific CDM-SSC-CPA-DD with generic information relevant to all CPAs to be included in this PoA. The CDM-SSC-PoA-DD and CDM-SSC-CPA-DD were reviewed against the criteria stated in Article 12 of the Kyoto Protocol, the CDM modalities and procedures as agreed in the Marrakech Accords, the simplified modalities and procedures for small-scale CDM project activities, the procedures for registration of a programme of activities as a single CDM project activity and the relevant decisions by the CDM Executive Board, including the approved baseline and monitoring methodology AMS-I.D, version 16.

The validation of the programme has also considered the completed CDM-SSC-CPA-DD for the CPA with the title First Solar PoA in India by SENES Consultants submitted together with the CDM-SSC-CPA-DD.

The validation was based on the recommendations in the Validation and Verification Manual /27/. The validation is not meant to provide any consulting towards the programme participants. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the project design.



POA VALIDATION REPORT

3 METHODOLOGY

The validation consisted of the following three phases:

- I a desk review of the CDM-SSC-PoA-DD and the PoA specific CDM-SSC-CPA-DD with generic information relevant to all CPAs to be included in this PoA
- II follow-up interviews with programme stakeholders
- III the resolution of outstanding issues and the issuance of the final validation report and opinion.

The following sections outline each step in more detail.

3.1 Desk review of the programme design documentation

The following table lists the documentation that was reviewed during the validation:

3.1.1 Documentation provided by the project participants

- /1/ SENES Consultants India Private Limited: *CDM-SSC-PoA-DD for PoA titled "First Solar PoA in India by SENES Consultants"*, version 01 dated 15 December 2010, Version 02 dated 30 May 2011 and version 3 dated 28 November 2011, version 4 dated 9 March 2012
- /2/ SENES Consultants India Private Limited: *Generic CDM-SSC-CPA-DD for PoA titled "First Solar PoA in India by SENES Consultants"*, Version 01 dated 15 December 2010, Version 02 dated 30 May 2011 and version 3 dated 28 November 2011
- /3/ SENES Consultants India Private Limited: *CDM-SSC-CPA-DD for CPA titled "15122010 First Bundled CPA on Grid Connected Solar Power Project in India by SENES consultants"*, Version 01 dated 15 December 2010, Version 02 dated 30 May 2011 and version 3 dated 28 November 2011
- /4/ Jawarharlal Nehru National Solar Mission Resolution document, Government of India, Ministry of New and Renewable Energy dated 11 January 2010 to confirm the purpose of the mission is to promote solar power generation available at <http://mnre.gov.in/pdf/resolution-jnnsn.pdf>
Jawarharlal Nehru National Solar Mission document to confirm the purpose of the mission is to promote solar power generation available at <http://mnre.gov.in/pdf/mission-document-JNNSM.pdf>
- /5/ List of upcoming thermal plants in India as on 2 June 2010 available on <http://thermalpower.industry-focus.net/index.php/industry-overview/342-list-of-upcoming-thermal-plants-in-india.html>
- /6/ Power Purchase Agreements signed between operators and respective electricity distribution agency to confirm that plants are PV solar based power plants, capacities of power plants and lifetime of projects:
 - 1) Tayal & Co. Mohali and Haryana Power Purchase Centre dated 20 August 2010
 - 2) RV Akash Ganga Infrastructure and Uttarakhand Power Corporation Limited (UPCL) dated 21 August 2010; Ref No. 970/UPCL/CGM (Com)/Solar
 - 3) Gajanan Financial Services and Andhra Pradesh Central Power Distribution Company Limited dated 14 July 2010; Ref No. CGM/APCPDCL/Solar/04/2010



POA VALIDATION REPORT

- 4) SDS Solar Private Limited and Haryana Power purchase centre dated 20 August 2010
- 5) Asian Aero-Edu Aviation Private Limited & Jaipur Vidyut Vitran Nigam Limited (JVVNL) and Jodhpur Vidyut Vitran Nigam Limited (JdVVNL) and Ajmer Vidyut Vitran Nigam Limited (AVVNL) dated 16 August 2010
- 6) RAYS Power Private Limited and JVVNL and JdVVNL and AVVNL dated 20 August 2010
- 7) Soma Enterprise Limited & Punjab State Power Corporation dated 18 August 2010; Ref No. 499/IPC/303 C152666
- 8) Vivek Pharmachem Limited JVVNL and JdVVNL and AVVNL dated 16 August 2010; Ref No. RREC/NSM/RPSSGP/Rooftop D9137
- 9) Chandraleela Power Energy (P) Ltd dated 20 August 2010
- 10) Basant Enterprises and JVVNL and JdVVNL and AVVNL dated 16 August 2010; Reference No. RREC/NSM/RPSSGP/Rooftop
- 11) Navbharat Buildcon Pvt Ltd and JVVNL and JdVVNL and AVVNL dated 16 August 2010
- 12) GS Atwal & Co (Engineers) Pvt. Ltd. dated 18 August 2010; Reference No. 501/IPC/303
- 13) AEW Infratech Pvt. Ltd and JVVNL and JdVVNL and AVVNL dated 16 August 2010; Reference No. RREC/NSM/RPSSGP/Rooftop/D. 9131

Work Order by G S Atwal & Co Engineers Pvt. Ltd. on Scatec Solar AS (Ref. No. GSA/SPP/PB/ SS/01) dated 4 February 2011 to confirm the start date of the first CPA and hence of the PoA.

/7/ Agreement signed between SENES Consultants India Pvt. Ltd. (Managing Entity) and respective project operators confirming their awareness to project activity being subscribed to the PoA:

1. Rays Power Pvt. Ltd. And SENES dated 8 March 2011
2. Vivek Pharmachem India Ltd. And SENES dated 11 March 2011
3. AEW Infratech and SENES dated 23 March 2011
4. Asian Aero-Aviation and SENES dated 8 March 2011
5. Basant Enterprises and SENES dated 15 March 2011
6. Chandraleela Power Energy and SENES dated 9 March 2011
7. Gajanan Financial Services and SENES dated 13 May 2011
8. GS Atwal & Co and SENES dated 23 March 2011
9. Navbharat Buildcon and SENES dated 11 March 2011
10. Soma Enterprises and SENES
11. R.V Akash Ganga and SENES dated 23 March 2011
12. SDS Solar and SENES dated 11 March 2011
13. Tayal & Co and SENES dated 23 March 2011

/8/ CERC Order on Renewable Energy Tariff dated 9 November 2010;
http://www.cercind.gov.in/2010/November/Signed_Order_256-2010_RE_Tariff_FY_11-12.pdf for capital cost, Operation & Maintenance (O&M) cost



POA VALIDATION REPORT

- /9/ EPC Quotations for Plant Load Factor (PLF), capital cost and O&M cost:
- Proposal for 1 MW Solar Photovoltaic System by WIPRO EcoEnergy dated 25 November 2010
 - Proposal for 2 MW Solar Photovoltaic System by WIPRO EcoEnergy dated 23 February 2011
 - Proposal for 5 MW Solar Photovoltaic System by TATA BP
 - Proposal for 10 MW Solar Photovoltaic System by Lanco Solar dated 5 February 2011
 - Proposal for 5 MWp Solar Photovoltaic System by Lanco Solar dated 5 February 2011
- /10/ Stakeholder Consultation Documents:
- Minutes of Meeting dated 24 November 2010
 - Invitation Letters dated 14 November 2010
 - Attendance Sheet dated 24 November 2010
- /11/ Central Electricity Authority (CEA) CO₂ Database User Guide Version 5 dated November 2009 published by Government of India, Ministry of Power to confirm the CO₂ emission factor for grid power and a total installed power capacity of 147 965.41 MW
http://cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm
- /12/ EIA Notification published in the Gazette of India, Ministry of Environment and Forests dated 14 September 2006 to confirm that no EIA is necessary
Government of India, Ministry of Environment and Forests, Office memorandum dated 13 May 2011 confirming that solar power projects are not covered under EIA and no environmental clearance is required.
- /13/ http://www.cea.nic.in/power_sec_reports/executive_summary/2010_09/8.pdf to verify that the contribution of solar is negligible in the generating installed capacity of power utilities in India
- /14/ Weblinks
<http://india.gov.in/knowindia/profile.php>
http://india.gov.in/knowindia/india_at_a_glance.php
http://india.gov.in/knowindia/state_uts.php
to verify the geographical area and location of India
- /15/ Ministry of New and Renewable Energy, Government of India XIth Plan dated December 2006 to confirm the government plans for promoting renewable energy and solar power.
- /16/ Dr. Vinod K. Singhania, May 2010; “*Direct Taxes Reckoner*” to verify the income tax, Minimum Alternate Tax rate and depreciation rates for the assessment years 2010-11 and 2011-12 onwards.
- /17/ Undertaking by SENES Consultants India Private Limited (Managing Entity) dated 22 March 2011 confirming that the power generation units under the CPA is not registered or being registered as a stand-alone CDM project outside of the PoA.
- /18/ State Bank of India document confirming the Prime Lending Rate to be 12.5% effective from 21 October 2010.



POA VALIDATION REPORT

State Bank of India document confirming effective rate in January 2011 at 12.75% and on 14 February 2011 at 13%, thus confirming an increasing trend of interest rates in India.

- /19/ Excel sheet for NPV calculation, version 3 dated 04 September 2011
- /20/ Excel sheet for CER estimations, version 3 dated 4 September 2011
- /21/ Land Lease Document dated 27 August 2010 to confirm the land cost
- /22/ Weblink <http://eaindustry.nic.in/> for Wholesale Price Index, Office of Economic Advisor of India, Government of India to verify escalation for electricity. [inputs of type, yearly and name of commodity needs to be entered]
- /23/ Weblink <http://www.mnre.gov.in/press-releases/press-release-13072009-2.pdf> and Weblink <http://www.ecoworld.com/products/electronics/indias-solar-power.html> to confirm contribution from grid connected solar power plants at 2.1 MW and cost of INR 170 Million to INR 200 Million per MW for a solar power plant.

3.1.2 Letters of approval

- /24/ DNA of India: *Letter of Approval issued by Ministry of Environment and Forests, Government of India dated 20 September 2011*

3.1.3 Methodologies, tools and other guidance by the CDM Executive Board

- /25/ CDM Executive Board: *Validation and Verification Manual*, version 1.2
- /26/ CDM Executive Board: *Baseline and monitoring methodology; "Grid Connected renewable energy generation", AMS-I.D*, version 16
- /27/ CDM Executive Board: *Tool to calculate the emission factor for an electricity system*, Version 2 to take the default values should be used for weights of OM and BM for solar power generation projects
- /28/ CDM Executive Board: Procedures for registration of PoA as a single registered CDM project activity, EB 47, Annex 29 for start date of CPA
CDM Executive Board EB 65, Annex 3 "Standard for demonstration of additionality, development of eligibility criteria and application of multiple methodologies for Programme of Activities".
- /29/ CDM Executive Board: Annex 26, version 01 of EB 60 Meeting Report to confirm that additionality has to be done at PoA level
CDM Executive Board: Annex 24 of EB 63 Attachment A to Appendix B, version 8
CDM Executive Board: Annex 34 of EB 35; Non – binding practice examples to demonstrate Additionality for SSC project activity.
- /30/ CDM Executive Board: Annex 3, EB22 Clarifications on the consideration of National and/or sectoral policies and circumstances in baseline scenarios
CDM Executive Board: Annex 32, EB53 Clarifications on the consideration of National and/or sectoral policies and circumstances in baseline scenarios
- /31/ CDM Executive Board: Annex 13, version 03 of EB54 Guidelines on assessment of debundling for SSC project activities

EB 66 Annex 63, Glossary of CDM terms to confirm the definition of start date of PoA



POA VALIDATION REPORT

http://cdm.unfccc.int/filestorage/9/C/4/9C4SWT62ZGLHXODQ03VFN7A5EJ1RIU/eb66_repan63.pdf?t=SIV8bTBtNzhufDBLogjQsakUIhILpyqkO6Rq

- /32/ CDM Executive Board: Annex 5, version 05 of EB 62 Guidelines on assessment of investment analysis
CDM Executive Board: Annex 11 of EB48 Guidelines for the reporting and validation of Plant Load Factors, version 01
- /33/ CDM Executive Board: Annex 38, version 04.1 of EB 55; Procedures for registration of activities as a single CDM project activity and issuance of certified emission reductions for a programme of activities

3.1.4 Documentation used by DNV to validate / cross-check the information provided by the project participants

- /34/ <http://cdm.unfccc.int/ProgrammeOfActivities/registered.html> to verify the registered PoA across world
- /35/ Newspaper clips to cross verify the plant cost for solar power projects:
Headlines India dated 17 June 2010, cost of INR 150 Million per MW for a proposed solar power project in Karnataka by Titan Energy Systems Ltd.
- The Indian News dated 22 January 2011, cost of INR 150 Million per MW for a proposed solar power project in the state of Gujarat

The major changes between the webhosted version and the final version submitted for registration are

1. The eligibility criterion for inclusion of CPA has been revised as per latest EB guidelines.
2. The details of the individual power plants forming the first CPA has now been included.

3.2 Follow-up Interviews with Programme Stakeholders

On 9 February 2011, 15-16 February 2011 and 8 June 2011, DNV team comprising of Mr. Nitin Kapoor and Mr. G.N Agrawal met with some of the project owners and participants in the PoA as well as government officials. The meetings were primarily held at the offices while some of the proposed project sites at Rajasthan were visited. The below listed persons have been interviewed and/or provided additional information to the presented documentation. The PP and the managing entity were present across locations and interactions with various stakeholders

	Date	Name	Organization	Topic
/36/	9 February 2011	Sumit Barat	SENES Consultants	Confirmation on the technology used for setting up of solar power plants that only solar PV is being used for the first CPA
		Prateek Goel	SENES Consultants	



POA VALIDATION REPORT

	Aniruddha Das Gupta Eswaran Venkatesna	Soma Enterprises Limited-Project Owner	Confirmation whether the project activity involves any alteration or is a retrofit or a green field project. Power purchase agreements with the Sanction letters for setting up of solar power projects. Project additionality Monitoring parameters Project performance checks
15 February 2011	Baldev Singh Chander Prakash Bhatia	Additional Collector- Jaisalmer Revenue Assistant (Collector Office- Jaisalmer)	Confirmation that the projects have been allotted on land owned by the government and that there has been no displacement.
16 February 2011	Ashok Jain	Project Owner- Basant Enterprises	Same as mentioned for Soma Enterprises Limited
8 June 2011	Sumit Barat Richa Lohia Eswaran Venkatesna	SENES Consultants Soma Enterprises	PoA design Technology employed/ to be employed. Monitoring parameters and procedures EPC Contracts for erection and commissioning of solar power plants Discussion on appropriateness of input values used for financials and energy generation. Additionality



POA VALIDATION REPORT

3.3 Resolution of outstanding issues

The objective of this phase of the validation was to resolve any outstanding issues which needed to be clarified prior to DNV's positive conclusion on the PoA. In order to ensure transparency a validation protocol was customised for the project. The protocol shows in a transparent manner the criteria (requirements), means of verification and the results from validating the identified criteria. The validation protocol serves the following purposes:

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

The validation protocol consists of four tables. The different columns in these tables are described in the figure below. The completed validation protocol for the programme of activity "First Solar PoA in India by SENES Consultants" is enclosed in Appendix A to this report.

A corrective action request (CAR) is raised if one of the following occurs:

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

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

A forward action request (FAR) is raised during validation 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.



POA VALIDATION REPORT

Validation Protocol Table 1: Mandatory Requirements for CDM Programme of Activities				
Requirement	Reference	Conclusion		
The requirements the project must meet.	Gives reference to the legislation or agreement where the requirement is found.	This is either acceptable based on evidence provided (OK), a Corrective Action Request (CAR) due to non-compliance with stated requirements or a request for Clarification (CL) where further clarifications are needed.		

Validation Protocol Table 2: Requirement Checklist				
Checklist question	Reference	Means of verification (MoV)	Assessment by DNV	Draft and/or Final Conclusion
The various requirements in Table 1 are linked to checklist questions the project should meet. The checklist is organised in different sections, following the logic of the CDM-PDD	Gives reference to documents where the answer to the checklist question or item is found.	Means of verification (MoV) are document review (DR) , interview (I) or any other follow-up actions (e.g., on site visit and telephone or email interviews) and cross-checking (CC) with available information relating to projects or technologies similar to the proposed CDM project activity under validation.	The discussion on how the conclusion is arrived at and the conclusion on the compliance with the checklist question so far.	OK is used if the information and evidence provided is adequate to demonstrate compliance with CDM requirements. A corrective action request (CAR) is raised when project participants have made mistakes, the CDM requirements have not been met or there is a risk that emission reductions cannot be monitored or calculated. A clarification request (CL) is raised if information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met. A forward action request (FAR) during validation is raised to highlight issues related to project implementation that require review during the first verification of the project activity.

Validation Protocol Table 3: Resolution of Corrective Action and Clarification Requests			
Corrective action and/or clarification requests	Ref. to checklist question in table 2	Response by project participants	Validation conclusion
The CARs and/or CLs raised in Table 2 are repeated here.	Reference to the checklist question number in Table 2 where the CAR or CL is explained.	The responses given by the project participants to address the CARs and/or CLs .	The validation team's assessment and final conclusions of the CARs and/or CLs .

Validation Protocol Table 4: Forward Action Requests		
Forward action request	Ref. to checklist question in table 2	Response by project participants
The FARs raised in Table 2 are repeated here.	Reference to the checklist question number in Table 2 where the FAR is explained.	Response by project participants on how forward action request will be addressed prior to first verification.

Figure 1 Validation protocol tables



POA VALIDATION REPORT

3.4 Internal quality control

The validation report underwent a technical review performed by a technical reviewer qualified in accordance with DNV's qualification scheme for CDM validation and verification.

3.5 Validation team

Role	Last Name	First Name	Country	Type of involvement							Financial Expert
				Desk review	Site visit / Interviews	Reporting	Supervision of work	Technical review	Sectoral competence(TA 1.2)	Sectoral competence(TA 1.1)	
Technical team leader (CDM validator)	Kapoor	Nitin	India	✓	✓	✓			✓		✓
Sector Competence	Agrawal	GN	India	✓	✓	✓				✓	
Technical reviewer	Wong	Simon Yon-Sing	Malaysia					✓	✓	✓	

The qualification of each individual validation team member is detailed in Appendix B to this report.



POA VALIDATION REPORT

4 VALIDATION FINDINGS

The findings of the validation are stated in the following sections. The validation criteria (requirements), the means of verification and the results from validating the identified criteria are documented in more detail in the validation protocol in Appendix A.

The final validation findings relate to the programme design as documented and described in the PoA design documentation dated 9 March 2012 /1/.

4.1 Participation requirements

The PoA participant is SENES Consultants India Private Limited, which is designated as coordinating/managing entity authorized to participate in the PoA by the DNA of the India. The letter of approval /24/ was received by the Programme participant directly by the DNA of India and has been verified in original by DNV. DNV does not doubt the authenticity of the letter of approval.

Host Party involved, i.e., India, meet the requirements to participate in the CDM, and has provided written approval of voluntary participation in the programme. The host Party India fulfils the participation requirements, having ratified the Kyoto Protocol on the 26 August 2002 and having established the National Clean Development Mechanism Authority, Ministry of Environment and Forests (MoEF), as its DNA. The PP which is the Managing entity is required to inform the National Clean Development Mechanism Authority of any additional programme that is added to the PoA.

The letter of approval and confirmation by the host Party of the programme's contribution to the country's sustainable development has been obtained through letter dated 20 September 2011 and has been verified by DNV in original /24/. The letters of approval were received from the project participants. DNV does not doubt the authenticity of the letters of approval. DNV considers the letters are in accordance with paragraphs 45- 48 of the VVM. DNV considers the letter to be in accordance with paragraphs 45 to 48 of VVM /25/

No public funding is involved, and the validation did not reveal any information that indicates that the programme can be seen as a diversion of ODA funding towards India.

4.2 Programme design

The "First Solar PoA in India by SENES Consultants" managed by the "SENES Consultants India Private Limited" PoA consists of the implementation of grid connected solar power plants in India.

The installation of solar power plants aims to utilize solar energy, which is a renewable source of energy to meet the India's energy demand and thereby enable displacement of non renewable resources /1/. The programme is expected to bring environmental benefits (reduction of GHG emissions, reduced dependence on non-renewable sources of energy) and create employment for local people, thus contributing to sustainable development objectives of the Indian Government.

The PoA is planned to be implemented in the political boundary of India /14/. The physical boundary has been described in the PoA-DD /1/. The latitude and longitude of India /14/ lies between:

- Latitudes- 8°4' and 37°6' North



POA VALIDATION REPORT

- Longitude- 68°7' and 97°25' East

The PoA shall have grid connected solar based photo voltaic (PV) or thermal based solar power plants with each CPA limited to a maximum of 15 MW_{el} installed capacity. The first CPA consists of a bundle of 13 PV based solar power plants with a total capacity of 14.8 MW /2/ connected to the respective Indian regional grids, which is North East West and North East (NEWNE) grid and Southern grid.

The length of PoA is 28 years as per the para 6(h), EB guidance on PoA /33/. The start date of the crediting period of the Programme is 1 March 2012 or the date of complete submission to UNFCCC, whichever is later /1/. The start date of crediting period for first CPA is 1 March 2012 or date of complete submission to UNFCCC whichever is later /3/. The first work order for the first plant of the CPA bundle was issued on 4 February 2011 /6/, hence as per EB guidance /31/ this becomes the start date of the PoA.

The EPC contractor for each of the solar power plants included in the programme shall train the onsite staff on operation and maintenance of the power plants and SENES as a managing entity shall ensure training to onsite staff on the aspects related to monitoring plan forming a part of this PoA DD /1/.

The programme description is to the consideration of DNV complete and accurate.

4.3 Criteria for inclusion of CDM Programme Activities

The PoA-DD /1/ established clear eligibility criteria for inclusion of each CPA under the PoA /28/, requiring for each CPA that:

- Be a grid connected solar based renewable energy generation units.
- Be a newly built solar power plant.
- Have no energy generation equipment transferred from another activity and no existing equipment is transferred to another activity.
- Ensure that the geographical boundary of each solar power generation unit under the SSC-CPA is uniquely defined with GPS coordinates and is within the boundary of PoA.
- Confirm that the power generation unit/ units under the CPA is not registered or being registered as a stand-alone CDM project outside of the PoA. This would be achieved through undertaking by project implementer and display of unique identification number for each power plant at the entrance and near to the meters.
- Confirm that if the new unit has both renewable and non-renewable components (e.g., a solar/diesel unit), the eligibility limit of 15 MW for a small-scale CDM project activity applies only to the renewable component.
- Confirm that the start date of any CPA is not, prior to the commencement of validation of the programme of activities, i.e. the date on which the CDM-PoA-DD is first published for global stakeholder consultation. The date of webhosting of the CDM-PoA-DD is 30 December 2010.
- Confirm and fulfil the additionality criterion as per attachment A of appendix B (following Annex 24, EB 63) which confirms that solar technologies (photovoltaic and solar thermal electricity generation) that are grid-connected are automatically additional up to an installed capacity of 15 MW. This applicability criterion has been added based on



POA VALIDATION REPORT

EB 60, Annex 26 guidelines /29/ which requires a confirmation of additionality for CPAs by means of eligibility criterion.

- Declaration that there is no ODA funding flowing into the individual CPA's
- In the event the power plant operator has an operating solar power plant within 1 km of boundary of the proposed plant then the combined capacity of all such plants put together by the same operator should not exceed 15 MW. At the time of inclusion of CPA, the managing entity would do a check within a radius of 1 km of power plant as part of the CPA to confirm the condition is met.

4.4 Operational, management and verification plan

The programme consists of the implementation of solar power plants across India. SENES Consultants will coordinate the Small-Scale Programme of Activities (SSC-PoA) and will support the project operators in implementing the CDM Programme Activities (CPAs) in India while acting as the focal point for all CDM related activities. The CME has developed three teams for the operation, management and verification of the PoA as detailed in section A.4.4.1 of the PoA DD. The CME has clearly defined roles and responsibilities of the personnel involved in the complete process. It has further divided the personnel involved into three teams for operation and maintenance of the PoA. DNV has assessed the process and competencies of the team members in each of the three teams while carrying out interviews and based on the curriculum vitae of the team members provided by the CME during the course of validation and considers the same to be adequate and in line with the requirements of Annex 3, EB 63.

The CME has developed adequate procedures for document control, record handling and storage. It has been clearly described that all the data related to the power generation and emission reduction calculations shall be maintained onsite. A soft copy shall be maintained onsite by each of the project operators and the same shall be shared periodically (six monthly at the minimum) with the Managing entity. SENES would maintain a record of all the power plants included in the PoA and will assign a Unique Identification Number to all the power plants to avoid any duplicacy.

In order to avoid double counting, an undertaking in form of contract agreement would be taken from all the power plant operators which shall cover the following at the minimum

- Operator is aware and has agreed that power generation equipment has been included in this PoA and as a part of a uniquely identified CPA.
- That the operator undertakes that no emission reductions benefits from the projects shall be claimed by it through any other instruments either as a standalone project or through bundle or as CPA to any other PoA.
- In addition, the CME would also undertake cross referencing of every project forming a part of the CPA with publicly available information on the UNFCCC website and other relevant websites defined in the operation and Management plan.
- There will be a unique identification number assigned to every power plant and the same shall be displayed at the entrance to the plant as well as next to the energy meters once the power plant is commissioned and included as a part of CPA.



POA VALIDATION REPORT

DNV has verified the signed contract agreements /7/ confirming to both the stated conditions with all 13 project operators which form a part of the first CPA. The first CPA constitutes 13 small scale solar power plants operating at different locations across India with a total capacity of 14.8 MW.

It has been confirmed from undertaking by the PP /17/ that there are no other PoA (small or large scale) for same technology or measure in any of the GHG reduction schemes or which form a part of any other scheme. Hence based on EB 54, Annex 13, guidance for determining the occurrence of debundling under PoA /31/, a proposed small scale CPA of this PoA is deemed not to be de bundled.

The Managing entity would in the form of a contract agreement with the individual project operators shall ensure that they have agreed to their specific project activity being subscribed to this PoA.

The Managing entity shall monitor the monitoring parameters for all the power plants that form a part of the PoA. The DOE shall verify the generation data for all the power plants which are active and operating at the time of verification.

DNV has assessed the detailed operation and management plan as elaborated in section A.4.4.1 of the PoA DD and confirms it is line with the requirements of EB guidance. The assessment is based on interviews with the key members of the CME, and verification of the resumes of the members forming a part of the various teams defined. The CME has well laid out procedures for training and capacity development on an annual basis and if necessary for any new recruits added to the teams. The procedures for technical review and inclusion of CPA's to the PoA is well laid out and includes the following steps

1. Initial screening;
2. Preparation of documents relevant to addition like CPA DD, emission reduction calculations
3. Eligibility checks
4. Technical review of the complete process by the CME before submission to DOE for its inclusion

The procedure for continual improvement has been identified with annual feedback and audits every six months by the Director of CME. The audits and feedback is expected to provide relevant inputs to confirm that the operation and management plan is working as designed and any shortcomings/ findings shall be dealt with as required on a case to case basis.

DNV considers the operation and management plan to be adequate and also confirms the CME's ability to implement the same.

4.5 Baseline identification

The PoA and consequently each CPA applies the simplified baseline methodology for selected small-scale CDM project activity; AMS-I.D version 16; "*Grid connected renewable electricity generation*" /26/.

The programme meets the applicability criteria of AMS-I.D, version 16 /26/:

- This PoA/CPA comprises of renewable energy generation units comprise of renewable energy generation using Solar photovoltaic or Solar Thermal technology and will supply



POA VALIDATION REPORT

electricity to Indian grid. This has been verified for the first CPA from the Power Purchase Agreements (PPA) signed between the project operators and respective state electricity distribution agencies /6/.

- This PoA/CPA will install a new solar power plant at a site where there was no solar renewable energy power plant operating prior to the implementation of the project activity (Greenfield plant) with a combined capacity of power generation units under each CPA not exceeding 15 MW.
- The applicability conditions related to hydro power, biomass based and combined heat and power systems are not applicable to this programme and hence have not been discussed.

Therefore, the applicability conditions of AMS-I.D, version 16 /26/, are satisfied and met completely.

The baseline scenario has been identified in accordance with AMS-1.D /26/. In absence of the PoA, the power would have been generated in existing power plants in the electricity grid. The PoA/ CPA would consist of power plants all across India. There are two regional grids in India; North, Eastern, Western and North Eastern Grid (NEWNE Grid) and the Southern Grid.

Thus, in line with the methodology /26/ and Tool to calculate the emission factor for an electricity system, Version 2 /27/, the baseline emission factor for the NEWNE and Southern grid has been calculated as 0.9225 tCO₂/MWh and 0.9451 tCO₂/MWh respectively. The emission factor has been sourced from Central Electricity Authority Database “CO₂ Baseline Database for the Indian Power Sector User Guide - Version 5.0 Database” /11/, using a combined margin approach consisting 75% operating margin and 25% build margin approach as per the tool to calculate the emission factor for an electricity system, Version 2 /27/. The weightages assigned are as per the tool /27/ for solar power plants.

The build margin and operating margin has been calculated as follows:

Grid	Simple Operating Margin (tCO ₂ /MWh)	Build Margin (tCO ₂ /MWh)	Combined Margin (tCO ₂ /MWh)
NEWNE	1.005	0.675	0.9225
Southern	0.988	0.818	0.9451

DNV confirms that the CEA database is an official publication of the Government of India for the purpose of CDM baselines and the OM in the CEA database is calculated using the simple OM approach based on the generation weighted average emissions per electricity unit of all fossil-fuelled generating sources serving the system over a three year period of 2006-2007, 2007-2008 and 2008-2009. BM is calculated *ex-ante* based on the 20% most recent capacity additions in the grid based on net generation for the year 2008-09 as described in tool /27/.

The programme system boundary includes physical, geographical site of the renewable generation sources included in the PoA in accordance with AMS-I.D /26/.

The selected sources and gases are justified for the project activity. Emission sources and gases included in the project boundary are:

	<i>GHGs involved</i>	<i>Description</i>
--	----------------------	--------------------



POA VALIDATION REPORT

<i>Baseline</i>	<i>CO₂</i>	<i>For the net electricity displaced from the grid.</i>
<i>Project</i>	<i>Nil</i>	<i>No project emissions are envisaged from the project activity.</i>
<i>Leakage</i>	<i>Nil</i>	<i>No leakage envisaged in the project.</i>

The identified boundary and selected sources and gases are justified for the project activity. The validation of the project activity did not reveal other greenhouse gas emissions occurring within the proposed CDM project activity boundary as a result of the implementation of the proposed project activity which is expected to contribute more than 1% of the overall expected average annual emission reduction, which is not addressed by the methodology AMS-I.D, version 16 /26/.

4.6 Additionality

4.6.1 Additionality of Programme

It has been verified that there is no mandatory legal requirement in India to generate electricity by installing solar power plants. It has also been verified that number of fossil fuel based thermal power plants are in pipeline in India /5/ thus confirming that there is no mandatory requirement to generate power through renewable sources only. Hence it is confirmed that the PoA being coordinated by SENES Consultants, a private entity which has no legal requirement to promote solar power projects in India.

Additionality has been done at PoA level and criterion has been established to determine additionality at each CPA level. This approach has been verified to be in line with EB 60 guidance, Annex 26 /29/ and has been found to be appropriate by DNV.

Additionality analysis has been conducted appropriately as per Attachment A to Appendix B /26/, Non – binding practice examples to demonstrate Additionality for SSC project activity (EB 35 Annex 34) /29/ has been followed while assessing the additionality.

In accordance with Attachment A to Appendix B /29/, barrier analysis has been done to assess the additionality. It is shown that the programme faces investment and prevailing practice barrier to its implementation. This has been done in addition to the requirements of Attachment A to Appendix B /29/ which confirms that grid connected solar power based renewable electricity generation are automatically additional upto a capacity of 15 MW.

Investment Barrier

The programme activity also demonstrates additionality through the existence of investment barrier. A NPV analysis has been chosen by project proponent since the project generates revenues without CDM. NPV analysis has been carried out for solar power plants with typical capacities of 1 MW, 2 MW, 5 MW, 10 MW and 15 MW. This has been done as the CPA which is likely to be added in the future can have solar power plants of different capacities and get implemented across the political boundary of India.

Incentives available under National Action Plan on Climate Change (NAPCC) an E- policy as per guideline provided in EB 22 Annex 3 /30/ to combat climate change by Government of India launched in 2008 has not been considered in the financial analysis. NAPCC led to formulations of several E- policies, such as the state level solar policies of Gujarat in 2009, and the launch of the Jawaharlal Nehru National Solar Mission (JNNSM) in 2010 to promote



POA VALIDATION REPORT

solar power /4/. However the financial analysis has been done for a situation without such E-policies and considers that the tariff available to the solar power projects would be as per the prevailing tariff in the region. This is as per guideline provided in EB 22 Annex 3 and EB 53 Annex 32 /30/ and avoids creation of incentives that may impact host parties contribution to the ultimate objective of the convention.

Input Parameters

The set up of a solar power plant primarily includes plant and machinery cost which has been sourced from quotations received by project operators from EPC contractors /9/. However DNV cross checked the cost for per MW to be INR 144.2 Million from CERC Order /8/ and the same has been taken for capacities where the CERC cost was found to be lesser then the cost quoted by the EPC contractor which was at INR 159.4 Million for 1 MW solar power plant. The cost of a 2 MW power plant has been taken based on the EPC quotation at INR 286 Million /9/ as this was more conservative then the per MW cost of CERC of INR 144.2 Million /8/. The same principal has been followed for all the capacities vis-à-vis 5 MW, 10 MW and 15 MW which are covered under this PoA. This is considered conservative. DNV has further independently cross checked with the several newspaper clips /35/ which give the cost/MW for similar solar power plants implemented or in pipeline in India to be INR 150 million per MW. Hence, the input costs considered in the financial analysis are in order and conservative.

It has been verified by DNV that just the land cost for a 0.8 MW solar power plant is INR 7.5 million /21/ which works out to be 5.2% of the plant and machinery cost. However the cost including land cost, project management cost, consultancy fee, license fee and other pre project and preliminary expenses have been considered as 5% of plant and machinery cost in the financial analysis which is considered conservative by DNV. These costs are associated with the land cost for setting the power plant as well as initial engineering expenses.

Working capital has been considered as 2 months revenue from electricity generation based on CERC order /8/. This is found to be reasonable and appropriate and has been added back at the end of the project lifetime

The total capital investment based on the above input parameters considered in the projects of various capacities is as listed below and has been detailed in the excel sheet /19/ for NPV calculations:

- 1 MW: 152.9 Million INR
- 2 MW: 303.4 Million INR
- 5 MW: 764.7 Million INR
- 10 MW: 1453.8 Million INR
- 15 MW: 1975.9 Million INR

Depreciation has been provided based on the rates given vide Schedule XIV of the Companies Act 1956 for the calculation of Minimum Alternate Tax and based on Appendix I of Income Tax Rules for the computation of Income Tax /16/. The rates specified in Schedule XIV of the Companies Act 1956 for depreciation are 5.28% straight line method and the IT rules specify depreciation of 15% written down value method for the calculation of depreciation. These are accepted accounting methods as the maximum of the Income Tax or the Minimum



POA VALIDATION REPORT

Alternate Tax is payable as per the rules of host country. The corporate income tax rate and as well as the Minimum alternate tax have been confirmed to be correct at 18.54% and 33.22% /16/.

The discount factor has been conservatively taken as 11.75% for the calculation of NPV analysis.

The programme involves solar power generation, it falls under Group 1 which is “Energy Industries”. Since the project activity shall be implemented in India, the default value for expected return on equity for India for Group 1 is 11.75% as per EB 61, Annex 13 “Guidance on assessment of investment analysis” /32/

It was also confirmed that the bank prime lending rate PLR rate /18/ of State Bank of India effective at the time of start date of PoA was 12.5% (effective 21 October 2010). The PLR is the minimum rate of interest which a bank charges to its most preferred customer. It has further been verified that the PLR has increased over the PLR pertaining at the time of start of the PoA /18/.

Thus the selection of discount factor of 11.75% for the NPV calculation by the project participant is conservative.

Base tariff of INR 5.5/kWh has been verified from Power Purchase Agreement (PPA) signed between the project operators and respective state electricity distribution agencies /6/. This base tariff is same for all the project operators irrespective of the installed capacity. The yearly escalation of 1.1% in the tariff has been verified from the Wholesale Price Index given by Economic Advisor to India, Government of India /20/ for electricity as a commodity and has been built in the financial analysis while projecting the revenues.

The plant load factor taken as 19% is based on quotations received from third party EPC Contractors /9/ is justified and is in line with EB48, Annex 11; “Guidelines for the reporting and validation of Plant Load Factors”, /32/. It has been further cross verified from the CERC Order which also gives a Plant Load Factor of 19% for solar power projects /8/.

The operation and maintenance (O&M) expenses has been verified from the quotations received from EPC contractors /9/ and have been cross verified from the CERC Order /8/. The manpower cost has been taken as the minimum requirement of staff for a power plant and is found to be appropriate by DNV.

The salvage value has been taken as 10% of the plant and machinery cost which is appropriate based on the CERC guidelines /8/. This has been added as a cash inflow towards the end of the operating life time of the project.

In summary, all the input parameters have been cross checked with relevant sources that include quotations/ CERC order/ income tax rules/newspaper clips etc and have been found to be appropriate and conservative.

DNV is able to confirm that the right inputs have been taken in the project cost and financial analysis in the form of NPV.

Investment Barrier: Calculation and conclusion

The NPV calculations were provided in a spreadsheet /19/ covering 25 years of expected operation period of the underlying project activity based on the CERC order /8/.

The calculations were verified and found to be correct by DNV. The assumptions used in the calculations were deemed to be appropriate by DNV. The project NPV was checked



POA VALIDATION REPORT

separately for each capacity and verified to be negative for all capacity variation. Thus, it is concluded that the project is not financially attractive without revenues from CDM.

Plant Capacity (MW)	Total Capital cost (Million INR)	O&M and Manpower Cost (Annual for First year) (Million INR)	Revenue (Annual for First year) (Million INR)	NPV (INR Million)
1	152.9	1.96	9.15	-90.3
2	303.4	3.56	18.31	-174.9
5	764.7	5.95	45.77	-417.55
10	1453.8	12.69	91.54	-778.92
15	1975.9	17.72	137.31	-988.54

Sensitivity Analysis

A sensitivity analysis was carried out for parameters contributing more than 20% to revenues or costs in order to check the robustness of the financial analysis. Reasonable variations of the total investment, base tariff and O&M costs were checked by calculating the variation necessary to reach the a NPV of zero (at which the project touches the discount rate and hence becomes viable) and then discussing the likelihood for that to happen. None of the parameters in the sensitivity analysis are considered to have any significant positive correlation as described below.

- **Project Cost:** Decrease in project cost is not expected since the estimates are based on the minimum requirement of capital for the plants. Moreover, the NPV of the project remains negative up to 71% decrease in project cost for 1 MW and 2 MW capacity power plants, 66% decrease for a 5 MW and 10 MW power plant and 62% decrease for 15 MW power plant, which is unrealistic estimate of investment cost.
- **Base tariff:** The NPV does not become zero even with an increase of 100% in tariff for all the capacities and hence the situation of NPV being zero is unrealistic. This is over in spite of the tariff has already been escalated every year at 1.1% based on the wholesale price index of electricity /20/.
- **O&M Expenses:** NPV does not become zero on decrease in O&M. Even the elimination of O&M expenses does not result in NPV becoming zero for any of the power capacities discussed.

Barriers due to Prevailing Practise

The programme faces prevailing practise barriers in addition to the financial barriers discussed above. This is primarily because of the low level of technological maturity and reliability of solar power in India. This can be confirmed from the fact that only 2.1 MW of solar power has been installed as of 31 March 2009 /23/ against a total installed capacity of 147 965.41 MW in India covering thermal, nuclear and renewable sources of power /11/. It has further been verified that a 140 MW Integrated Solar Combined Cycle plant at Mathania, Rajasthan could also not be utilized on the basis of a review in 2006 that recommended a more cautious approach towards deployment of grid-interactive solar projects at this juncture in view of technological and commercial reasons /23/.



POA VALIDATION REPORT

In conclusion, the assessment of the arguments presented above is deemed to sufficiently demonstrate that the programme is not a likely baseline alternative, and that the emission reductions resulting from the programme are additional.

4.6.2 Additionality of Typical CPA

The PP has demonstrated additionality at PoA level. The additionality has been demonstrated by using investment barrier which is as per Attachment A of Appendix B for demonstrating additionality of small scale projects. The various criterion used for demonstrating additionality is the scale which has been discussed in section 4.6.3 of this report.

4.6.3 Approach for demonstrating additionality of CPAs

Considering that the design of solar power plant has the same pattern and costs involved the criteria to demonstrate the additionality of each SSC-CPA will be restricted to:

Criteria	Benchmark	Rationale
Scale	The installed capacity of the power generating unit should be less than or equal to 15 MW.	<p>The eligibility criterion has been selected in accordance with Section 4.6 of additionality.</p> <p>The source of installed capacity to be checked while adding a CPA would be based on allotment letter or signed Power Purchase Agreement (PPA) by the respective state electricity board or any other similar agency.</p>

4.7 Monitoring plan

The programme applies the approved monitoring methodology AMS-I.D version 16 titled “Grid connected renewable energy generation” /26/. The monitoring will involve metering the electricity generated by individual power plants recorded in the plant log-books and cross checked from the joint meter readings signed by e representatives of the project operator and respective power distribution agency. This can be further confirmed using the sales invoices raised by respective project operators on the power distribution companies. Details of the data collection and frequency of data recording and associated formats are described and observed to be adequate.

The responsibilities and authorities for project management, procedures for monitoring and reporting, and QA/QC procedures have been systematically established and formalized. Data



POA VALIDATION REPORT

will be saved both electronically and on paper and archived until 2 years after the end of the crediting period of each CPA /1/.

The project monitoring plan is in compliance with the monitoring methodology AMS-I.D, version 16 /26/.

The monitoring is complete and suitable for the project activity and DNV considers the project participants able to implement the monitoring plan.

4.7.1 Methodological choices and equations to be used for calculation of emission reductions of a CPA

Emission reduction calculations are transparently documented by spreadsheets /20/. The estimated amount of GHG emission reductions from the first CPA in Programme of Activities is 22 762 tCO₂e/y during the first 7 years. As requested by AMS-I.D (Version 16) /26/ the emissions reductions will be calculated yearly based on net electricity generation in the CDM-CPA-DD of each CPA.

4.7.2 Parameters determined ex-ante

Baseline emission estimations are documented in the spreadsheet /19/.

Baseline emission factor for the NEWNE and southern regional grid is established *ex-ante* based on the approved methodology AMS-I.D version 16 Paragraph 12 /26/, using a combined margin approach consisting 75% operating margin and 25% build margin approach according to procedures given in “Tool to calculate the emission factor for an electricity system” /27/ as follows:

1. Identification of the relevant electricity system: As per CEA database /11/, Indian electricity system is divided into two power grids: North- East- West- North-East (NEWNE) and Southern grid. The PoA boundary is India and individual power project sites can be located anywhere across India. Thus, NEWNE and Southern grids have been identified appropriately as relevant electricity systems.
2. Choose whether to include off-grid power plants in the project electricity system. Project proponent has following two options as per tool /27/ under this step:
 - a. Option I: Only grid power plants are included in the calculation.
 - b. Option II: Both grid power plants and off-grid power plants are included in the calculation.

PP has selected Option I for the programme of activity that only grid connected power plants are included in the calculation.
3. Selection of a method to determine the operating margin (OM): As per the tool /27/, operating margin emission factor can be calculated based on any one of the following methods:
 - a. Simple OM, or
 - b. Simple adjusted OM, or
 - c. Dispatch data analysis OM, or



POA VALIDATION REPORT

d. Average OM.

PP has selected first option, i.e., Simple OM. As per tool /27/, the simple OM method can only be used if low cost/must run resources constitute less than 50% of total grid generation in: 1) average of the five most recent years, or 2) based on long-term averages for hydroelectricity production.

It has been verified from the CEA database CEA database, Version 5 /11/ that low cost/ must-run power sources (hydro/ nuclear power) constitute less than 30% of grid, hence project proponent is justified in using Simple OM. For the simple OM, the emissions factor can be calculated using either of the two following data vintages:

- *Ex ante* option: If the *ex-ante* option is chosen, 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, this can be calculated using a 3-year generation-weighted average, based on the most recent data available at the time of submission of the CDM-PDD to the DOE for validation.
- *Ex post* option: If the *ex-post* option is chosen, the emission factor is determined for the year in which the project activity displaces grid electricity, requiring the emissions factor to be updated annually during monitoring.

PP has taken *ex-ante* approach using the full generation-weighted average for the most recent 3 years available at the time of PDD submission for webhosting using values from Central Electricity Authority (CEA) in their CO₂ baseline database Version 5.0, November 2009 /11/.

4. Calculation of the Operating Margin emission factor using Simple OM method: the simple OM has been calculated using Option B of the tool /27/; based on the total net electricity generation of all power plants serving the system and the fuel types and total fuel consumption of the project electricity system using data from 3 year data vintage from CEA database /11/:

Simple Operating Margin (tCO ₂ /MWh) (incl. Imports)				Average (tCO ₂ /MWh)
	2006-07	2007-08	2008-09	
NEWNE	1.008	1.000	1.007	1.005
Southern	0.999	0.991	0.973	0.988
India	1.006	0.998	1.009	1.004

5. Identification of the group of power units to be included in the build margin (BM): According to tool /27/, the sample group of power units used to calculate the build margin consists of either:



POA VALIDATION REPORT

- a. The set of five power units that have been built most recently, or
- b. The set of power capacity additions in the electricity system that comprise 20% of the system generation (in MWh) and that have been built most recently

PP has chosen to use the data available from CEA database /11/ to calculate the build margin which consists of the power plant capacity additions in the electricity system that comprise 20% of the system generation (in MWh) and that have been built most recently as this sample group comprises larger annual generation than the generation of the sample group consisting of the five power plants that have been built most recently.

6. Calculation of the Build Margin Emission Factor: the Build margin emission factor has been calculated ex-ante based on the most recent information available on plants already built for sample group at the time of PDD submission for validation and webhosting using CEA database Version 5.0, November 2009 /11/:

Build Margin (tCO₂/MWh)	2008-09
NEWNE	0.675
Southern	0.818
India	0.709

7. Calculation of the combined margin emission factor: Combined emission factor has been calculated using the BM and OM as explained and mentioned above for both the NEWNE and Southern Grid using the weightages for solar power projects. The weightages are consisting of 75% operating margin and 25% build margin resulting in the following values:

- Combined Margin for NEWNE Grid: 0.9225 tCO₂/MWh
- Combined Margin for Southern Grid: 0.9451 tCO₂/MWh

The emission coefficients are determined from official data published by the Central Electricity Authority CO₂ Baseline Database. Central electricity Authority (CEA) (which is an official source of Ministry of Power, Government of India) have worked out baseline emission factor for various grids in India and made them publicly available CO₂ Baseline Database for the Indian Power Sector User Guide - Version 5.0 Database, November 2009 /11/. This was the latest available at the time of validation. The calculations and assumptions have been verified and found to be correct by DNV.

4.7.3 Parameters monitored ex-post

The data required to be monitored *ex-post* is:

- EG_y: the net electricity exported to the grid (difference of the export and the import from the grid).

The net electricity supplied to the respective regional grid will be monitored by the measurement records (log-books) maintained by the plant operator. In addition, the electricity



POA VALIDATION REPORT

sales receipts are provided for data quality control and cross check raised on respective electricity distribution agencies. The primary recording of the electricity fed to the state utility grid will be carried out in form of log-books maintained at power plants and will be verified from the joint meter readings/ sale receipts taken jointly at the incoming feeder of the state power utility. The term jointly refers to representatives of respective electricity distribution agency and the plant operator who will be present during recording of the meter readings of each of the power plant. The electricity meters installed will be of accuracy (minimum 1% or 1s).

The data will be kept for 2 years following the end of the each crediting period. The equipment that shall be used to monitor the above mentioned parameters and the monitoring frequency have been given in the PoA-DD /1/.

4.7.4 Management system and quality assurance for monitoring and reporting

Responsibilities and authorities for project management, monitoring and reporting activities, measurement, training and reporting techniques and QA/QC procedures are defined in PoA-DD /1/.

Calibration and testing of meters will be done annually. The main meter and check meter will be tested for accuracy. The calibration, periodical testing, sealing and maintenance of meters will be carried out in the presence of authorized representative(s) of the seller and the representative(s) of the seller shall sign on the results thereof. Records of calibration will be maintained for verification.

All indicators of importance for controlling and reporting of project performance are incorporated in the monitoring plan. The procedures for calibration and maintenance, performance reviews, internal auditing, corrective actions etc. has also been defined in the monitoring plan.

The operator will collect the data for the monitoring plan and the plant manager will verify the correct application of the operating procedures as given in the monitoring plan.

DNV considers the ability of the project participant ability to implement the monitoring, the related QA/QC checks adequately.

4.8 Environmental impacts

The proposed project activity contributes to generation of green power and is expected to benefit the economic development of the region. Thus, the project activity is expected to have only beneficial impacts and no adverse impacts are foreseen.

A detailed environmental impact assessment is not necessary. This was verified from the Environment Impact Assessment Notification S.O. 1533 dated 14 September 2006 issued by the Ministry of Environment and Forests /12/. This was further confirmed from the Government of India, Ministry of Environment & Forests office memorandum which clearly states that the solar power plants are not covered under EIA and thus does not require environmental clearance /12/.

4.9 Comments by local stakeholders

The local stakeholder consultation was carried out at the PoA level. As stated in the CDM PoA- DD, local stakeholders, such as the project developers, officers from the Renewable



POA VALIDATION REPORT

Energy Corporation, and representatives of project operators were invited to comment on the project /10/. The letters sent to the local stakeholders, the comments received and how due account was taken were evidenced by DNV during the site visit /10//36/. DNV considers the local stakeholder consultation has been carried out adequately.

4.10 Comments by Parties, stakeholders and NGOs

The CDM-SSC-PoA-DD dated 15 December 2010, the PoA specific CDM-SSC-CPA-DD with generic information relevant to all CPAs to be included in this PoA and the CDM-SSC-CPA-DD for the CPA with the title First Solar PoA in India by SENES consultants was made publicly available on the UNFCCC's website

<http://cdm.unfccc.int/ProgrammeOfActivities/Validation/DB/COOOTTMCPBQF4QCUASJDRIX65NCDI6/view.html>

and Parties, stakeholders and NGOs were through the CDM website invited to provide comments during a 30 days period from 30 December 2010 28 January 2011.

One comment was received and is given (in unedited form) in the below text box.

Comment by: Neha

☐ Accredited NGO

☐ Party

☒ Stakeholder

Inserted on:

Subject:

Comment: The project is a very interesting initiative by SENES in Solar sector, however the managing entity should clarify the following:

“Though the additionality of the project considering GBI or other such incentives would be mockery of GOI initiative to combat climate change, the managing entity is requested to conduct a financial analysis without GBI for a sample 1 MW solar power plant and present same in PoA DD to ascertain the robustness of additionality argument.”

How DNV has considered the comment received in its validation:

As requested by stakeholder, financial analysis has been conducted for 1, 2, 5, 10 and 15 MW capacities without taking into account the GBI incentives. Since the government policy on GBI came in 2010 under National Action Plan on Climate Change (NAPCC) 2008, it is found to be appropriate as per EB 22 guidance /30/. The calculations have been verified to be correct from excel sheet.

This has also been raised as a CL 7 and has been closed satisfactorily.

APPENDIX A

CDM VALIDATION PROTOCOL

Table 1 Mandatory Requirements for Clean Development Mechanism (CDM) Programmes of Activities

Requirement	Reference	Conclusion
About Parties		
1. The programme shall assist Parties included in Annex I in achieving compliance with part of their emission reduction commitment under Art. 3.	Kyoto Protocol Art.12.2	Annex I party is yet to be identified
2. The programme shall assist non-Annex I Parties in contributing to the ultimate objective of the UNFCCC.	Kyoto Protocol Art.12.2.	CAR-2 OK
3. The programme shall have the written approval of voluntary participation from the designated national authority of each Party involved.	Kyoto Protocol Art. 12.5a, CDM Modalities and Procedures §40a	CAR-2 OK
4. The programme shall assist non-Annex I Parties in achieving sustainable development and shall have obtained confirmation by the host country thereof.	Kyoto Protocol Art. 12.2, CDM Modalities and Procedures §40a	CAR-2 OK
5. In case public funding from Parties included in Annex I is used for the programme, these Parties shall provide an affirmation that such funding does not result in a diversion of official development assistance and is separate from and is not counted towards the financial obligations of these Parties.	Decision 17/CP.7, CDM Modalities and Procedures Appendix B, § 2	NA
6. Parties participating in the CDM shall designate a national authority for the CDM.	CDM Modalities and Procedures §29	OK
7. The host Party and the participating Annex I Party shall be a Party to the Kyoto Protocol.	CDM Modalities §30/31a	OK
8. The participating Annex I Party's assigned amount shall have been calculated and recorded.	CDM Modalities and Procedures §31b	NA
9. The participating Annex I Party shall have in place a national system for estimating GHG emissions and a national registry in accordance with Kyoto Protocol Article 5 and 7.	CDM Modalities and Procedures §31b	NA

Requirement	Reference	Conclusion
About Design of Programme		
10. The CDM-POA-DD sets a framework for the implementation of the PoA and defines unambiguously a CPA under the PoA.	PoA Procedures § 2	OK
11. The coordinating/managing entity shall be identified.	PoA Procedures § 2 (a)	OK
12. The boundary for the PoA in terms of a geographical area (e.g., municipality, region within a country, country or several countries) within which all CPAs included in the PoA will be implemented is defined.	PoA Procedures § 2 (b)	OK, the political boundary of India has been identified as the boundary of PoA
13. Eligibility criteria are defined for inclusion of a project activity as a CPA under the PoA, which shall include criteria for demonstration of additionality, and the type and/or extent of information (e.g. criteria, indicators, variables, parameters or measurements) that shall be provided by each CPA in order to ensure its eligibility.	PoA Procedures § 2 (g)	CAR-4 OK
14. The length of the PoA is not exceeding 28 years.	PoA Procedures § 2 (h)	OK
15. The operational and management arrangements established by the coordinating/managing entity for the implementation of the PoA is described, including a description of a record keeping system for each CPA under the PoA, a system/procedure to avoid double accounting e.g. to avoid the case of including a new CPA that has been already registered either as CDM project activity or as a CPA of another PoA, the provisions to ensure that those operating the CPA are aware and have agreed that their activity is being subscribed to the PoA.	PoA Procedures § 2 (i)	CL-3 OK
16. The proposed statistically sound sampling method/procedure to be used by DOEs for verification of the amount of emission reductions achieved by CPAs under the PoA is described. In case the coordinating/managing entity opts for a verification	PoA Procedures § 2 (k)	NA

Requirement	Reference	Conclusion
method that does not use sampling but verifies each CPA there is a transparent system defined and described that ensures that no double accounting occurs and that the status of verification can be determined anytime for each CPA.		
About small-scale programmes of activities (if applicable)		
17. The CPAs shall meet the eligibility criteria for small scale CDM project activities set out in § 6 (c) of the Marrakech Accords.	Simplified Modalities and Procedures for Small Scale CDM Project Activities §12a,c	OK
About additionality		
18. Additionality of the programme as a whole is demonstrated because in the absence of the CDM (i) the proposed voluntary measure would not be implemented, or (ii) the mandatory policy/regulation would be systematically not enforced and that non-compliance with those requirements is widespread in the country/region, or (iii) that the PoA will lead to a greater level of enforcement of the existing mandatory policy /regulation.	Kyoto Protocol Art. 12.5c, CDM Modalities and Procedures §43 PoA Procedures § 2 (e)	CAR 3, CAR 4 OK
19. Additionality of a typical CPA is demonstrated by using the procedure provided in the baseline and monitoring methodology applied.	PoA Procedures § 2 (f)	CAR 4 OK
About application of baseline and monitoring methodology		
20. The baseline and monitoring methodology shall be previously approved by the CDM Executive Board.	CDM Modalities and Procedures §37e	OK
21. A baseline shall be established on a project-specific basis, in a transparent manner and taking into account relevant national and/or sectoral policies and circumstances.	CDM Modalities and Procedures §45c,d	OK
22. The baseline methodology shall exclude to earn CERs for decreases in activity levels outside the project activity or due to force majeure.	CDM Modalities and Procedures §47	OK
23. The monitoring plan for a typical CPA is developed in accordance with the	PoA Procedures § 2 (j)	CL 6

Requirement	Reference	Conclusion
approved monitoring methodology, and identification of the monitoring provisions and data parameters a CPA has is to apply/monitor		OK
24. Provisions for monitoring, verification and reporting shall be in accordance with the modalities described in the Marrakech Accords and relevant decisions of the COP/MOP.	CDM Modalities and Procedures §37f	CL-6 OK
About forecast emission reductions		
25. The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change.	Kyoto Protocol Art. 12.5b	OK
About environmental impacts		
26. Documentation on the analysis of the environmental impacts of the programme activity, including transboundary impacts, shall be submitted, and, if those impacts are considered significant by the programme participants or the Host Party, an environmental impact assessment in accordance with procedures as required by the Host Party shall be carried out.	CDM Modalities and Procedures §37c	<input checked="" type="checkbox"/> Analysis at PoA level <input type="checkbox"/> Analysis at CPA level
About stakeholder comments		
27. Comments by local stakeholders shall be invited, a summary of these provided and how due account was taken of any comments received.	CDM Modalities and Procedures §37b	<input checked="" type="checkbox"/> Analysis at PoA level <input type="checkbox"/> Analysis at CPA level
28. Parties, stakeholders and UNFCCC accredited NGOs shall have been invited to comment on the validation requirements for minimum 30 days, and the project design document and comments have been made publicly available.	CDM Modalities and Procedures §40	OK
Other		
29. The project design document shall be in conformance with the CDM-PoA-DD	CDM Modalities and Procedures	OK

Requirement	Reference	Conclusion
format.	Appendix B, EB Decision	

Table 2 Requirements Checklist

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
A. General Description of the Programme of Activities <i>The project design is assessed.</i>					
A.1. Title of the PoA					
A.1.1. Does section A.1 of the PoA-DD include a clearly identifiable project title, version number of the PoA-DD and date of the PoA-DD?	/1/	DR	<input checked="" type="checkbox"/> Clearly identifiable title of the project activity <input checked="" type="checkbox"/> Version number of the PDD is included <input checked="" type="checkbox"/> Date of the PDD is included. The PoA-DD dated 15 December 2010 of version 01 mentions the title clearly as “First Solar PoA in India by SENES Consultants		OK
A.1.2. Is the PoA-DD is in accordance with the applicable requirements for completing PoA-DDs?	/1/	DR	<input checked="" type="checkbox"/> Yes		OK
A.2. Programme Boundaries <i>Programme Boundaries are the limits and borders defining the GHG emission reduction project.</i>					
A.1.3. Are the programme’s spatial boundaries (geographical) clearly defined?	/1/	DR	The political boundary of India is chosen as the geographical boundary of the PoA. The geographical coordinates as required by the PoA template for the “geographical area of PoA” within which all the CPAs to be included in PoA will be implemented has not been provided.	CAR1	OK
A.1.4. Are the programme’s system boundaries (components and facilities used to mitigate GHGs) clearly defined?	/1/	DR	The PP needs to clearly define programme’s system boundaries in line with the applied methodology AMS-I.D, version 16. The programme boundary is not in line with the requirements of the methodology AMS-I.D, version 16.	CL1	OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
A.1.5. Can each CPA under the PoA be clearly identified individually including spatial boundaries (geographical) clearly defined?	/1/	DR	There is one CPA which has been webhosted along with the PoA titled; “15122010 First Bundled CPA on Grid Connected Solar Power Project in India by SENES Consultants”. The geographical coordinates as required by the CPA-DD template for all the sites included in the CPA have not been provided.	CAR-1	OK
A.1.6. Does the programme establish eligibility criteria for inclusion of a project as a CPA under the PoA?	/1/	DR	Yes, section A.4.2.2 of the PoA DD list down the eligibility criterion in the present PoA		OK
A.3. Participation Requirements <i>Referring to Part A, Annex 1 and 2 of the PoA-DD as well as the CDM glossary with respect to the terms Party, Letter of Approval, Authorization and Project Participant.</i>					
A.2.1. Which Parties and programme participants are participating in the programme?	/1/	DR	India is the Host Party and SENES Consultants India Private Limited is the programme participant		OK
A.2.2. Has the coordinating/managing entity of the programme been identified?	/1/	DR	The programme participant, SENES Consultants India Private Limited is the managing entity of the programme.		OK
A.2.3. Have all involved Parties provided a valid and complete letter of approval and have all private/public programme participants been authorized by an involved Party?	/1/	DR	The LoA from the host country and Annex 1 Party (if applicable) has not been provided.	CAR-2	OK
A.2.4. Do all participating Parties fulfil the participation requirements as follows:	/1/	DR	Yes, the host Party India fulfils the participation requirements, having ratified the	CAR-2	OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
<div>- Ratification of the Kyoto Protocol</div> <div>- Voluntary participation</div> <div>- Designated a National Authority?</div>			Kyoto Protocol on the 26 August 2002 and having established the National Clean Development Mechanism Authority, Ministry of Environment and Forests (MoEF), as its DNA. The LoA from the host country and Annex 1 Party (if applicable) has not been provided.		
A.2.5. Do all participating Parties fulfil the participation requirements as follows:	/1/	DR			
<div>a) Party has ratified the Kyoto Protocol</div> <div>b) Party has designated a Designated National Authority</div> <div>c) The assigned amount has been determined</div>	India (host)County XCountry Y				
	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No				
	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No				
	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No				
A.2.6. Do the letters of approval meet the following requirements?		DR			
<div>a) LoA confirms that Party has ratified the Kyoto Protocol</div> <div>b) LoA confirms that participation is voluntary</div> <div>c) The LoA confirms that the project contributes to the sustainable development of the host country?</div> <div>d) The LoA refers to the precise project activity title in the PDD</div> <div>e) The LoA is unconditional with respect to (a) to (d) above</div> <div>f) The LoA is issued by the respective Party’s DNA</div> <div>g) The LoA was received directly by the DNA or the PP</div> <div>h) In case of doubt regarding the authenticity of the letter of approval, describe how it was verified that the letter of approval is authentic</div>	India (host)County XCountry Y			CAR 2	OK
	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No				
	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No				
	<input type="checkbox"/> Yes <input type="checkbox"/> No NA NA				
	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No				
	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No				
	<input type="checkbox"/> DNA <input type="checkbox"/> PP <input type="checkbox"/> DNA <input type="checkbox"/> PP <input type="checkbox"/> DNA <input type="checkbox"/> PP				

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
A.3.1. Does the programme make provisions for meeting training and maintenance needs?	/1/	DR	As required by VVM para 123, the PP needs to describe the means of implementation of monitoring plan including data management.	CL-2	OK
A.4. Contribution to Sustainable Development <i>The project/programme's contribution to sustainable development is assessed.</i>	/1/	DR			
A.4.1. Has the host Party confirmed that the programme assists it in achieving sustainable development?	/1/	DR	The LoA from the host country and Annex 1 Party (if applicable) has not been provided.	CAR-2	OK
A.4.2. Will the programme create other environmental or social benefits than GHG emission reductions?	/1/	DR	The project besides resulting in lower dependence on fossil fuels, will contribute to short term employment during construction and long term employment while in operation.		OK
A.5. Small scale programme activity <i>It is assessed whether the project qualifies as small-scale CDM project activity</i>					
A.5.1. Do CPAs under the programme qualify as small scale CDM project activities as defined in paragraph 6 (c) of decision 17/CP.7 on the modalities and procedures for the CDM?	/1/	DR	Yes, the CPA mentioned under the programme qualifies as a small scale project as the total capacity of the bundle is 15 MW		OK
A.6. Operational, management and monitoring plan for the programme					
A.6.1. Do the operational and management arrangements established by the coordinating entity include a record keeping system for each CPA under the programme?	/1/	DR/I	Yes, the operational and management arrangements established by the coordinating entity includes a system for data storage and archiving		OK
A.6.2. Do the operational and management arrangements established by the coordinating entity include a	/1/	DR/I	Yes, this has been covered adequately under the eligibility criterion for inclusion of SSC-	CL-3	OK

* MoV = Means of Verification, DR= Document Review, I= Interview
CDM PoA Validation Protocol – Report No. 2010-0593, rev. 04

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
system/procedure to avoid including CPAs that have already been registered either as CDM project activity or as a CPA of another PoA?			CPA under this PoA. The coordination entity shall be taking an undertaking from the project operators to confirm the same. The PP needs to provide evidence to comply with the PoA requirement of Operational and Management plan (section A.4.4.1)		
A.6.3. Do the operational and management arrangements established by the coordinating entity include provisions to ensure that CPA implementers are aware and have agreed that their activity is being subscribed to the PoA?	/1/	DR	The letters of confirmation from the CPA implementers confirming their awareness and agreement to their project activity being subscribed to the PoA The PP needs to provide evidence to comply with the PoA requirement of Operational and Management plan (section A.4.4.1)	CL-3	OK
A.6.4. Does the monitoring plan include a description of a proposed statistically sound sampling method and procedure to be used by designated operational entities for verification of GHG emission reductions by CPAs under the programme? OR If the programme does not use verification method that applies a statistical method for sampling, has a system been defined to avoid double counting of CERs, and is the system transparent?	/1/	DR	Yes, adequate systems and procedures have been defined to avoid double counting of CERs and making the system transparent. These systems include 1. Records will be maintained by coordinating entity of all existing power generation unit under the CPA. There will be a cross-check done before adding a new CPA 2. The undertaking will be taken from all operators to confirm that project is not part of any other CDM project activity or any other PoA.		OK
B. Duration of the Programme of Activities, Crediting Period					

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
B.1.1. Are the programme starting date and length of the programme clearly defined and evidenced?	/1/ /6/	DR	Yes, the starting date of the PoA has been mentioned as 4 February 2011 which is the start date of the first CPA which is the date on which the first work order for the power plant included in the PoA was issued. This is considered OK	.	OK
B.1.2. Does the PoA design documentation confirm that the length of the PoA does not exceed 28 years?	/1/	DR	The PoA DD confirms the length of the PoA as 28 years		OK
C. Environmental Impacts <i>Documentation on the analysis of the environmental impacts will be assessed, and if deemed significant, an EIA should be provided to the validator.</i>			<input checked="" type="checkbox"/> Analysis at PoA level <input type="checkbox"/> Analysis at CPA level This section must only be completed if the analysis of environmental impacts is at PoA level.		
C.1.1. Has an analysis of the environmental impacts of the programme been sufficiently described?	/1/	DR	Yes, an analysis of the environmental impacts has been sufficiently described		OK
C.1.2. Are there any Host Party requirements for an Environmental Impact Assessment (EIA)?	/1/ /12/	DR	It has been confirmed from the Ministry of Environment and Forests, Environment Impact Assessment Notification S.O.1533, dated 14 September 2006 (http://www.envfor.nic.in/legis/eia/so1533.doc) that setting up of a solar plant does not require an EIA.		OK
C.1.3. Will the programme create any adverse environmental effects?	/1/	DR	The programme is not expected to create any adverse environmental effects		OK
C.1.4. Are transboundary environmental impacts considered in the analysis?	/1/	DR	This is not considered necessary considering this involves setting up of solar power plants		OK
C.1.5. Have identified environmental impacts been	/1/	DR	There are no negative environmental impacts		OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
addressed in the programme design?			from the project activity		
C.1.6. Does the programme comply with environmental legislation in the host country?	/1/ /12/	DR	It has been confirmed from the Ministry of Environment and Forests, Environment Impact Assessment Notification S.O.1533, dated 14 September 2006 (http://www.envfor.nic.in/legis/eia/so1533.doc) that setting up of a solar plant does not require an EIA. Thus the programme complies with environmental legislation in the host country.		OK
D. Stakeholder Comments <i>The validator should ensure that stakeholder comments have been invited with appropriate media and that due account has been taken of any comments received.</i>			<input checked="" type="checkbox"/> Consultation at PoA level <input type="checkbox"/> Consultation at CPA level This section must only be completed if the analysis of environmental impacts is at PoA level.		
D.1.1. Have relevant stakeholders been consulted?	/1/	DR	It has been mentioned in PoA-DD that the stakeholder consultation has been done at PoA level. However, PP needs to justify the choice of level to conduct the stakeholder consultation. The identified stakeholders are solar power project operators included in first CPA, officials from Rajasthan Renewable Energy Corporation and representatives of other solar power project operators which is considered appropriate	CL -4	OK
D.1.2. Have appropriate media been used to invite comments by local stakeholders?	/1/ /10/	DR/I	The identified stakeholders were invited through personal letters. The PP is requested	CL -4	OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
	/36/		to provide a copy of the letters sent to the identified stakeholders along with the minutes and signed attendance sheet.		
D.1.3. If a stakeholder consultation process is required by regulations/laws in the host country, has the stakeholder consultation process been carried out in accordance with such regulations/laws?	/1/	DR	A stakeholder consultation process is not required by regulations/laws in the host country for setting up a solar power project.		OK
D.1.4. Is a summary of the stakeholder comments received provided?	/1/ /10/	DR	The summary of the comments and the concerns raised by the stakeholders has been mentioned along with the responses in the PoA DD		OK
D.1.5. Has due account been taken of any stakeholder comments received?	/1/ /10/	DR	Yes, the responses to the comments or concerns raised by stakeholders have been provided. All the comments have been addressed satisfactorily.		OK
E. Programme Baseline <i>The validation of the programme baseline establishes whether the selected baseline methodology is appropriate and whether the selected baseline represents a likely baseline scenario.</i>					
E.1. Baseline Methodology <i>It is assessed whether the programme applies an appropriate baseline methodology.</i>					
E.1.1. Does the programme apply an approved methodology and the correct version thereof?	/1/	DR	The programme applies the methodology AMS-I.D; “Grid connected renewable electricity generation”, version 16		OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
<p>E.1.2. Are the applicability criteria in the baseline methodology all fulfilled?</p> <p>Criterion 1: This category comprises renewable energy generation units, such as photovoltaic, hydro, tidal/wave, wind, geothermal and renewable biomass that supply electricity to a national or a regional grid. Project activities that displace electricity from an electricity distribution system that is or would have been supplied by at least one fossil fuel fired generating unit shall apply AMS-I.F.</p>	/1/	DR	<p>The project activities included in the programme involve generation of renewable energy using solar power and will supply electricity to the connected grid. This has also been mentioned as one of the eligibility condition for inclusion of CPA in the PoA.</p> <p>The PP is requested to provide evidence supporting that the generation is from renewable solar power.</p>	CL-5	OK
<p>Criterion 2: This methodology is applicable to project activities that (a) install a new power plant at a site where there was no renewable energy power plant operating prior to the implementation of the project activity (Greenfield plant); (b) involve a capacity addition¹; (c) involve a retrofit² of (an) existing plant(s); or (d) involve a replacement³ of (an) existing plant(s).</p>	/1/ /36/	DR	<p>The project activities included in the programme involve installing a new power plant at a site where there was no renewable energy power plant operating prior to the implementation of the project activity. This has been verified during the site interviews conducted where it was confirmed for the sample sites that there is no infrastructure and involves new power plant.</p>		OK
<p>Criterion 3: Hydro power plants with reservoirs that satisfy at least one of the following conditions are eligible to apply this methodology:</p> <ul style="list-style-type: none"> The project activity is implemented in an existing reservoir with no change in the volume of reservoir; 	/1/	DR	<p>The project activities included in the programme involve generation of renewable energy using solar power and does not involve hydropower plant.</p>		OK

¹ A capacity addition is an increase in the installed power generation capacity of an existing power plant through: (i) the installation of a new power plant besides the existing power plant/units, or (ii) the installation of new power units, additional to the existing power plant/units. The existing power plant/units continue to operate after the implementation of the project activity.

² Retrofit (or Rehabilitation or Refurbishment). It involves an investment to repair or modify an existing power plant/unit, with the purpose to increase the efficiency, performance or power generation capacity of the plant, without adding new power plants or units, or to resume the operation of closed (mothballed) power plants. A retrofit restores the installed power generation capacity to or above its original level. Retrofits shall only include measures that involve capital investments and not regular maintenance or housekeeping measures.

³ Replacement. It involves investment in a new power plant or unit that replaces one or several existing unit(s) at the existing power plant. The installed capacity of the new plant or unit is equal to or higher than the plant or unit that was replaced.

* MoV = Means of Verification, DR= Document Review, I= Interview

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
<ul style="list-style-type: none"> The project activity is implemented in an existing reservoir, where the volume of reservoir is increased and the power density of the project activity, as per definitions given in the Project Emissions section, is greater than 4 W/m²; The project activity results in new reservoirs and the power density of the power plant, as per definitions given in the Project Emissions section, is greater than 4 W/m². 					
Criterion 4: In the case of biomass power plants, no other biomass types than renewable biomass are to be used in the project plant.	/1/	DR	The project activities included in the programme involve generation of renewable energy using solar power and does not involve biomass power plant.		OK
Criterion 5: If the new unit has both renewable and non-renewable components (e.g., a wind/diesel unit), the eligibility limit of 15 MW for a small-scale CDM project activity applies only to the renewable component. If the new unit co-fires fossil fuel, the capacity of the entire unit shall not exceed the limit of 15 MW.	/1/	DR	The project activities included in the programme involve installing a new solar power plant at the site and does not involve non-renewable component.		OK
Criterion 6: Combined heat and power (co-generation) systems are not eligible under this category.	/1/	DR	The solar power projects would be connected to grid which does not involve combined heat and power (co-generation) systems. The output from such system is power which would be exported to the Grid. Thus the applicability condition has been adequately fulfilled.		OK
Criterion 7: In the case of project activities that involve the addition of renewable energy generation units at an existing renewable power generation facility, the added capacity of the units added by the project should be lower than 15 MW and	/1/ /36/	DR/ I	The project activities included in the programme involve installing a new power plant. This has been verified during the site visit conducted and interaction with the		OK

* MoV = Means of Verification, DR= Document Review, I= Interview
CDM PoA Validation Protocol – Report No. 2010-0593, rev. 04

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
should be physically distinct ⁴ from the existing units.			project operators. Thus it can be confirmed that the applicability condition is not applicable to the PoA.		
Criterion 8: In the case of retrofit or replacement, to qualify as a small-scale project, the total output of the retrofitted or replacement unit shall not exceed the limit of 15 MW.	/1/	DR	The project activities included in the programme do not involve any retrofit or replacement to an existing system. Thus it can be confirmed that the applicability condition is not applicable to the PoA.		OK
E.2. Baseline Scenario Determination <i>The choice of the baseline scenario will be validated with focus on whether the baseline is a likely scenario, and whether the methodology to define the baseline scenario has been followed in a complete and transparent manner.</i>					
E.2.1. What is the baseline scenario?	/1/	DR	The methodology AMS-I.D version 16 defines the baseline scenario as “electricity delivered to the grid by the project activity that otherwise would have been generated by the operation of the grid connected power plants and by the addition of new generation sources”. The PoA DD has identified the baseline scenario as “the power will be generated in existing and /or new power plants in the electricity grid”.		OK

⁴ Physically distinct units are those that are capable of generating electricity without the operation of existing units, and that do not directly affect the mechanical, thermal, or electrical characteristics of the existing facility. For example, the addition of a steam turbine to an existing combustion turbine to create a combined cycle unit would not be considered “physically distinct”.

* MoV = Means of Verification, DR= Document Review, I= Interview

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			Hence the baseline scenario identified is correct.		
E.2.2. What other alternative scenarios have been considered and why is the selected scenario the most likely one?	/1/	DR	Following alternatives have been identified by the PP: Alternative 1: Installation of a grid connected solar power plant Alternative 2: Power would be generated in existing and/or new power plants in the electricity grid. The PoA DD is not in line with the methodology requirements to identify the baseline scenario and demonstrate additionality.	CAR 3	OK
E.2.3. Has the baseline scenario been determined according to the methodology?	/1/	DR	Refer CAR 3	CAR 3	OK
E.2.4. Has the baseline scenario been determined using conservative assumptions where possible?	/1/	DR	Refer CAR 3	CAR 3	OK
E.2.5. Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies, macro-economic trends and political aspirations?	/1/	DR	Refer CAR 3	CAR 3	OK
E.2.6. Is the baseline scenario determination compatible with the available data and are all literature and sources clearly referenced?	/1/	DR	Refer CAR 3	CAR 3	OK
E.2.7. Have the major risks to the baseline been identified?	/1/	DR	Refer CAR 3	CAR 3	OK
E.3. Additionality of the Programme of Activities					
E.3.1. Has it been demonstrated that the programme is a voluntary coordinated action that would not be	/1/	DR	Since there is no mandatory legal requirement in India to generate electricity by		OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
implemented in the absence of CDM?			installing solar power plants. Thus it is confirmed that the programme is a voluntary coordinated action that would not be implemented in absence of CDM.		
E.3.2. If the programme is implementing a mandatory policy/regulation, has it been demonstrated whether the policy/regulation is being enforced? If it is enforced, has it been demonstrated that the programme will lead to a higher level of enforcement?	/1/ /5/ /4/	DR	There is no mandatory policy or regulation to implement this programme. DNV has been able to verify that there are several upcoming thermal power plants as confirmed from the website http://thermalpower.industry-focus.net/index.php/industry-overview/342-list-of-upcoming-thermal-plants-in-india.html In addition DNV has verified the resolution on “Jawaharlal Nehru Solar Mission” by Government of India, Ministry of New and Renewable Energy dated 10 January 2010 which aims at promoting the solar energy technologies to achieve parity with the grid power tariff.		OK
E.3.3. Are all assumptions stated in a transparent and conservative manner?	/1/	DR	The PP has used barrier analysis in specific investment and technological barrier to demonstrate additionality. The PoA DD is not in line with the methodology requirements to identify the baseline scenario and demonstrate additionality.	CAR-3	OK
E.3.4. Is sufficient evidence provided to support the relevance of the arguments made?	/1/	DR	Yes, sufficient evidence has been presented		OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
E.4. Additionality of CPAs					
E.4.1. Is the approach described for demonstrating additionality of a CPA in accordance with the using the procedure provided in the baseline and monitoring methodology applied?	/1/	DR	Refer CAR 3	CAR-3	OK
E.4.2. Are specific criteria for demonstrating the additionality of a specific CPA included in the PoA?	/1/	DR	<p>As per EB 47 paragraph 73 which states “in the context of PoA additionality is to be demonstrated either at PoA or at CPA level”. EB 54 paragraph 44 further states that “Board took note of the draft guidelines for determining the eligibility criteria related to the demonstration of additionality for inclusion of CPAs in registered PoAs and confirmed the proposed approach to demonstrate additionality in PoA only at the PoA level and use criteria for inclusion of the CPA in the PoA to establish additionality at the CPA level”. However, draft guidance for consideration by the board needs to be prepared by the secretariat.</p> <p>The draft guidance was prepared as Annex 3, to the proposed agenda for EB 56 but not considered during the 56th meeting.</p> <p>The same was prepared as Annex 2 to the proposed agenda for EB 57 but has still not been approved by the CDM EB.</p> <p>The PP needs to comply with the applicable UN guidelines in assessing the additionality of the CPA.</p>	CAR-4	OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
E.4.3. Is the additionality of a typical CPA demonstrated?	/1/	DR	Refer CAR 3	CAR 3	OK
E.5. Calculation of GHG Emission Reductions – Project emissions <i>It is assessed whether the procedure for calculating project emissions is according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.</i>					
E.5.1. Has the procedure to calculate project emissions of an individual CPA been documented according to the approved methodology and in a complete and transparent manner?	/1/	DR	As per paragraph 19 of the methodology $PE_y=0$ for most of the renewable project activities except emissions related to geothermal power plants and emissions from water reservoirs of hydro power plants. Hence project emissions have been taken as Nil		OK
E.5.2. Have conservative assumptions been used when determining the procedure to be used to calculate the project emissions?	/1/	DR	NA		OK
E.5.3. Are uncertainties in the project emission calculation procedure properly addressed?	/1/	DR	NA		OK
E.6. Calculation of GHG Emission Reductions – Baseline emissions <i>It is assessed whether the procedure for calculating baseline emissions is according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.</i>					

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
E.6.1. Has the procedure to calculate baseline emissions of an individual CPA been documented according to the approved methodology and in a complete and transparent manner?	/1/	DR	Yes, the calculations have been documented according to the approved methodology and in a complete and transparent manner.		OK
E.6.2. Have conservative assumptions been used when determining the procedure to be used to calculate the baseline emissions?	/1/	DR	Yes, conservative assumptions where possible have been used.		OK
E.6.3. Are uncertainties in the baseline emission estimates properly addressed?	/1/	DR	NA		OK
E.7. Calculation of GHG Emission Reductions – Leakage <i>It is assessed whether the procedure for calculating leakage is according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.</i>					
E.7.1. Has the procedure to calculate leakage emissions of an individual CPA been documented according to the approved methodology and in a complete and transparent manner?	/1/	DR	NA, as there is no transfer of equipments involved.		OK
E.7.2. Have conservative assumptions been used when determining the procedure to be used to calculate the leakage emissions?	/1/	DR	NA		OK
E.7.3. Are uncertainties in the leakage emission estimates properly addressed?		DR	NA		OK
E.8. Emission Reductions <i>The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change.</i>					
E.8.1. Does the PoA-DD provide a clear and correct way of calculating the emission reductions from each	/1/	DR	Since there are no project emissions and leakages, the emission reductions will be the	CL8	OK

* MoV = Means of Verification, DR= Document Review, I= Interview

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
CPA?			same as baseline emissions which has been mentioned clearly in the PoA-DD. The PP is requested to justify the appropriateness of all parameters used to calculate emission reductions in the Excel sheet and are reasonable as per VVM v1.2 paragraph 91.		
E.9. Monitoring Methodology <i>It is assessed whether the project applies an appropriate monitoring methodology.</i>					
E.9.1. Is the monitoring plan documented according to the approved methodology and in a complete and transparent manner?	/1/	DR	Yes, the monitoring plan documented according to the approved methodology and in a complete and transparent manner		OK
E.9.2. Will all monitored data required for verification and issuance be kept for two years after the end of the crediting period or the last issuance of CERs, for this programme, whichever occurs later?	/1/. /36/	DR/I	It has been mentioned that all the monitored data required for verification and issuance will be kept for two years after the end of the crediting period or the last issuance of CERs, for this programme, whichever occurs later under Data Storage and Archiving		OK
E.10. Monitoring Plan <i>It is established whether the monitoring plan provides for reliable and complete emission data over time.</i>					
E.10.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for estimation or measuring the greenhouse gas emissions within the programme boundary during the crediting period?	/1/	DR/I	Yes, the monitoring plan includes monitoring of net electricity supplied to the grid by the power plants (EG _y) in MWh. It will be monitored on a monthly basis based on statement of generation issued by respective		OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			state electricity boards. The data will be archived both on paper & electronically.		
E.10.2. Are the choices of programme GHG indicators reasonable and conservative?	/1/	DR/I	Yes, the programme GHG indicators have been chosen in line with the small-scale methodologies approved by the CDM EB.		OK
E.10.3. Is the measurement method clearly stated for each GHG value to be monitored and deemed appropriate?	/1/	DR/I	The measurement shall be based on electricity meter readings authorised by the state electricity board officials and a generation statement issued by them every month.		OK
E.10.4. Is the measurement equipment described and deemed appropriate?	/1/	DR	Yes, the measurement shall be done using calibrated electricity meters.		OK
E.10.5. Is the measurement accuracy addressed and deemed appropriate? Are procedures in place on how to deal with erroneous measurements?	/1/	DR/I	The PP needs to comply with the following monitoring methodology requirement: Accuracy of the electricity meters (both main and check meter) in the PoA DD along with the calibration frequency.	CL-6	OK
E.10.6. Is the measurement interval identified and deemed appropriate?	/1/	DR/I	The PP needs to comply with the following monitoring methodology requirement: Measuring and reporting frequency.	CL-6	OK
E.10.7. Is the registration, monitoring, measurement and reporting procedure defined?	/1/	DR	Refer CL 6	CL-6	OK
E.10.8. Are procedures identified for maintenance of monitoring equipment and installations? Are the calibration intervals being observed?	/1/	DR	CL 6	CL-6	OK
E.10.9. Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance	/1/	DR	The PP needs to comply with the following monitoring methodology requirement:	CL-6	OK

* MoV = Means of Verification, DR= Document Review, I= Interview

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
documentation)			Procedures related to data handling along with process performance checks.		
E.11. Monitoring of Sustainable Development Indicators/ Environmental Impacts <i>It is assessed whether choices of indicators are reasonable and complete to monitor sustainable performance over time.</i>					
E.11.1. Is the monitoring of sustainable development indicators/ environmental impacts warranted by legislation in the host country	/1/	DR	No, this is not warranted by any legislation in the host country India		OK
E.11.2. Does the monitoring plan provide for the collection and archiving of relevant data concerning environmental, social and economic impacts?	/1/	DR	NA		OK
E.11.3. Are the sustainable development indicators in line with stated national priorities in the Host Country?	/1/	DR	NA		OK
E.12. Management System and Quality Assurance for Monitoring and Reporting <i>It is checked that programme implementation is properly prepared for and that critical arrangements are addressed.</i>					
E.13.1. Is the authority and responsibility of overall programme management clearly described?	/1/	DR	Yes, the authority and responsibility of overall programme management clearly described. SENES being the managing entity will be responsible for overall programme management.		OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
E.13.2. Are procedures identified for training of monitoring personnel?	/1/	DR	Refer to CL2	CL2	OK
E.13.3. Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	/1/	DR/I	The project activity is not expected to cause any unintended emissions being a renewable energy solar power plant and hence it is not required at this stage.		OK
E.13.4. Are procedures identified for review of reported results/data?	/1/, /36/	DR/I	The procedures have adequately been identified in PoA-DD. Project operators will be responsible for on-site monitoring and maintenance of reports and data which will be submitted to SENES, managing entity of programme. SENES will be responsible for review and reporting of the reports and data.		OK
E.13.5. Are procedures identified for corrective actions in order to provide for more accurate future monitoring and reporting?	/1/, /36/	DR/I	It has been mentioned that the operators will record and submit the data to SENES, as per the monitoring requirements and in the provided formats for the periodic audits and verification process. This is considered adequate.		OK

Table 3 Resolution of corrective action requests and clarification requests

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
<p>CAR 1</p> <p>The geographical coordinates as required by the PoA template for the “geographical area of PoA” within which all the CPAs to be included in PoA will be implemented has not been provided.</p> <p>The geographical coordinates as required by the CPA-DD template for all the sites included in the CPA have not been provided.</p>	A.1.3	<p>Lying entirely in the northern hemisphere, India (host country) extends between latitudes 8° 4' and 37° 6' north, longitudes 68° 7' and 97° 25' east and measures about 3,214 km from north to south between the extreme latitudes and about 2,933 km from east to west between the extreme longitudes.</p> <p>The same has been revised in updated PoA-DD.</p> <p>The geographical co-ordinates and the individual power plants included in first CPA are:</p> <ol style="list-style-type: none"> 1) Tayal & Co. Mohali Latitude: 30°41' 59" N Longitude: 76°52' 48"E 2) RV Akash Ganga Infrastructure Latitude: 29°30' 00" N Longitude: 77°30' 00" E 3) Gajanan Financial Services Latitude: 15°38'0.88" N Longitude: 77°52' 00" E 4) SDS Solar Private Limited Latitude: 29°4'26. 61" N Longitude: 75°29' 15.74" E 5) Asian Aero-Edu Aviation Private Limited Latitude: 26°30' 0" N Longitude: 71°30' 0"E 6) Rays Power Private Limited Latitude: 26°30' 0" N 	<p>Latitudes and longitudes within which the political boundary of India lies have been provided now in revised PoA-DD as: Latitudes: 8° 4' and 37° 6' N, Longitudes 68° 7' and 97° 25'E.</p> <p>The geo-graphical coordinates of all the sites included in the project activity along with the all the details like operator name, state, village have now been provided in revised CPA-DD.</p> <p>The CAR is thus closed.</p>

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
		<p>Longitude: 71°19' 48" E</p> <p>7) Soma Enterprise Limited Latitude: 31°17' 17" N Longitude: 76°20' 22"E</p> <p>8) Vivek Pharmachem (India) Ltd. Latitude: 26°07' 59" N Longitude: 72°26' 72"E</p> <p>9) Navbharat Buildcon Pvt Ltd Latitude: 28°26'28.17" N Longitude: 74°30' 9.65" E</p> <p>10) Chandraleela Power Energy (P) Ltd. Latitude: 28°5' 58.35" N Longitude: 76°5' 40"E</p> <p>11) Basant Enterprises Latitude- 26° 54' 0" N Longitude- 71° 54' 0" E</p> <p>12) GS Atwal & Co. (Engineers) Pvt. Ltd. Latitude: 30°27' N Longitude: 74°37' E</p> <p>13) AEW Infratech Pvt. Ltd Latitude: 28° 29' 0" N Longitude: 73° 45' 0"E</p> <p>The same has been updated in revised CPA-DD.</p>	
CAR 2 The LoA from the host country and Annex 1 Party (if applicable) has	A.2.3, A.2.4, A.2.6	LoA dated 20 September 2011 (No. 4/16/2011-CCC) from host country (India) has been received and has been provided for verification. There is no Annex 1 Party	LoA dated 20 September 2011 (No. 4/16/2011-CCC) from Ministry of Environment &

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
not been provided.		identified as yet.	Forests, Government of India (Host Country India National CDM Authority) has been provided and has been verified in original. The CAR is closed
CAR 3 The PoA DD is not in line with the methodology requirements to identify the baseline scenario and demonstrate additionality.	E.2.2, E.2.3, E.2.4, E.2.5, E.2.6, E.2.7, E.4.1, E.4.3, E.3.3, E.4.1	<p>The approach to identify the baseline and demonstrate additionality has been revised to follow the methodology. Baseline has been identified in accordance with paragraph 10 of AMS-I.D.</p> <p>The baseline scenario as revised in Section E.4 of PoA-DD is: "Power would be generated in existing power plants in the electricity grid".</p> <p>Additionality analysis has been conducted as per Attachment A to Appendix B of 4/CMP.1 Annex II. While conducting Additionality analysis Non – binding practice examples to demonstrate Additionality for SSC project activity (EB 35 Annex 34) has been followed. As per the Attachment A, barrier analysis has been followed and following barriers have been identified:</p> <ol style="list-style-type: none"> 1. Investment Barrier 2. Prevailing practise barrier <p>It has been revised in Section A.4.3 of PoA-DD.</p>	<p>The PoA-DD has been revised to identify the baseline in line with the methodology, AMS-I.D.</p> <p>The additionality has now been conducted as per Attachment A to Appendix B of 4/CMP.1 Annex II which is applicable to small scale project activities. PP has used Investment barrier to demonstrate additionality and has carried out financial analysis. The approach is thus found to be appropriate. In addition prevailing practise barrier has also been discussed.</p> <p>The CAR is closed.</p>

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
<p>CAR 4</p> <p>As per EB 47 paragraph 73 which states “in the context of PoA additionality is to be demonstrated either at PoA or at CPA level”. EB 54 paragraph 44 further states that “Board took note of the draft guidelines for determining the eligibility criteria related to the demonstration of additionality for inclusion of CPAs in registered PoAs and confirmed the proposed approach to demonstrate additionality in PoA only at the PoA level and use criteria for inclusion of the CPA in the PoA to establish additionality at the CPA level”. However, a draft guidance for consideration by the board needs to be prepared by the secretariat.</p> <p>The draft guidance was prepared as Annex 3, to the proposed agenda for EB 56 but not considered during the 56th meeting.</p> <p>The same was prepared as Annex 2 to the proposed agenda for EB 57 but has still not been approved by the CDM EB.</p>	E.4.2	<p>The approach to additionality has been made clear as per para 4, Annex 26 of EB 60 Meeting Report which states that “The Board clarified that a full additionality assessment is not required in the context of component project activities (CPA), rather the confirmation of additionality for CPAs should be conducted by means of the eligibility criteria.”</p> <p>Hence an eligibility criterion has been determined in the revised PoA.</p> <p>The PP has used “benchmark base tariff” as the eligibility criteria for inclusion of CPA in PoA in Section A.4.3 and E.5.2 of the revised PoA-DD.</p> <p>Benchmark base tariff is the tariff above which the NPV of the operating units becomes positive. In determining the base tariff available to the project, any special tariff declared as a consequence of National Action Plan for Climate Change 2008, like JNNSM, Gujarat state policy, NVVN or any other similar scheme that may come in future would not be considered. This is in line with EB22 guidance. Instead the choice of base tariff would be based on any of the follows in order of preference:</p> <ol style="list-style-type: none"> PPA (Power Purchase Agreement) in the event it clearly distinguishes between base tariff and E-policy incentive Average Open access rate over a period of six months prior to CPA formulation available on Indian Energy Exchange (http://www.ixindia.com/) 	<p>As per the latest guidance of Executive Board (para 4, EB 60), the PP has demonstrated additionality at the PoA level. The guidance further suggests that an additionality criterion for inclusion of CPA has to be laid at PoA level.</p> <p>PP has used “benchmark base tariff” as the eligibility criteria for inclusion of CPA in PoA as per the guidance of para 4, EB 60. The benchmark tariff for capacities of 1 MW, 2 MW, 5MW, 10MW and 15 MW has been calculated at PoA level as provided in the excel sheets and verified by DNV.</p> <p>The approach is found to be appropriate by DNV.</p> <p>The CAR is thus closed.</p>

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
The PP needs to comply with the applicable UN guidelines in assessing the additionality of the CPA.		<p>iii. Tariff available to any other similar power generation project (Option to be used only in the event 1 & 2 are not available).</p> <p>Following are capacity wise benchmark base tariff upto which the project is additional:</p> <p>a) Upto 1MW: 15.40 INR/kWh b) Above 1MW upto 2MW: 15.10 INR/kWh c) Above 2MW upto 5MW: 14.70 INR/kWh d) Above 5MW upto 10MW: 14.11 INR/kWh e) Above 10MW upto 15MW: 12.80 INR/kWh</p> <p>The eligibility criteria states that at the time of inclusion of CPA, in the event base tariff available to the power generation unit is more than the benchmark base tariff for respective capacities as mentioned in the revised PoA-DD, the power generation unit would not be eligible for inclusion in the PoA.</p>	
<p>CL 1</p> <p>The programme boundary is not in line with the requirements of the methodology AMS-I.D, version 16.</p>	A.1.4	<p>In accordance with para 9 of AMS-I.D, the physical, geographical site of the renewable generation sources included in the PoA delineates the project boundary. Same has been updated in revised PoA-DD</p>	<p>The programme's system boundary has now been correctly included in revised PoA-DD in accordance with AMS-I.D.</p> <p>The CL is thus closed.</p>
CL 2	A.3.1	The following are the procedures that shall be in place	The training and maintenance

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
As required by VVM para 123, the PP needs to describe the means of implementation of monitoring plan including data management.		<p>for data management</p> <p>Training and maintenance procedures</p> <p>EPC Contractors for each of the power plants would train the on-site staff of the power plant on operation and maintenance of the power plant. SENES (managing entity) would ensure training to on-site staff with respect to adherence to the Monitoring Plan of the project activity. Records of the training would be kept.</p> <p>Internal audit of all the records of the plants will be carried out twice a year. During these audits all the data and parameters that need to be monitored as per the monitoring plan would be checked and shortcomings if any will be reported and addresses. It has been updated in revised PoA-DD submitted to the DOE.</p>	<p>procedures have been provided in the revised PoA-DD. The procedures are adequate to meet the requirements of power plant as well as CDM and thus ensure that the PP shall be able to carry out the monitoring of the power plants. DNV considers the PPs ability to implement the procedures mentioned.</p> <p>The CL is thus closed.</p>
<p>CL 3</p> <p>It is not clear who all are the individual project operators that have been included in the first CPA.</p> <p>The PP needs to provide evidence to comply with the PoA requirement of Operational and Management plan (section A.4.4.1)</p>	A.6.2, A.6.3	<p>The list of all project operators/ owners included in the first CPA has been provided in updated CPA-DD.</p> <p>An undertaking from all project operators confirming their awareness and agreement to their project activity being subscribed to the PoA has been provided in the agreements signed between SENES Consultants India Pvt. Ltd. (Managing Entity) with respective project operators:</p> <ol style="list-style-type: none"> 1) Tayal & Co. Mohali dated 8 March 2011 2) RV Akash Ganga Infrastructure dated 23 March 2011 3) Gajanan Financial Services dated 13 May 2011 4) SDS Solar Pvt. Ltd dated 11 March 2011 	<p>The list of plant operators has been provided in the CPA-DD and has been verified.</p> <p>An undertaking from all the project operators in form of agreement signed with SENES has been verified to confirm project operator's awareness and agreement to their project activity being subscribed to the PoA.</p> <p>The CL is thus closed.</p>

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
		<p>5) Asian Aero-Edu Aviation Private Limited dated 8 March 2011</p> <p>6) Rays Power Private Limited dated 8 March 2011</p> <p>7) Soma Enterprise Ltd dated 15 April 2011</p> <p>8) Vivek Pharmachem (India) Ltd dated 11 March 2011</p> <p>9) Navbharat Buildcon Pvt dated 11 March 2011</p> <p>10) Chandraleela Power Energy (P) Ltd dated 9 March 2011</p> <p>11) Basant Enterprises dated 15 March 2011</p> <p>12) GS Atwal & Co (Engineers) Pvt. Ltd. dated 23 March 2011</p> <p>13) AEW Infratech Pvt. Ltd dated 23 March 2011</p> <p>The same has been updated in revised PoA-DD dated</p>	
<p>CL 4</p> <p>The PP needs to clarify the choice of level at PoA or CPA to conduct the stakeholder consultation as required by EB procedures (EB 47, Annex 29, version 3).</p> <p>The PoA DD is not clear on the stakeholder consultation process and means of invitation.</p>	D.1.1, D.1.2	<p>PoA procedure gives the choice to conduct stakeholder consultation either at PoA or at CPA level.</p> <p>The stakeholder consultation has thus been carried out at PoA level on 24 November 2010.</p> <p>The identified stakeholders are technology suppliers, project operators, government officials.</p> <p>The identified stakeholders were invited through invitation letters. Copy of invitation letters sent to various stakeholders along with the minutes and attendance sheet for consultation done have been provided to DOE for verification.</p>	<p>The choice of stakeholders for the project activity is considered appropriate. DNV has verified sample invitation letter, the attendance sheet as well the minutes of the stakeholder meeting. The stakeholder summit has been attended by technology suppliers plant owners, officials of the Rajasthan Renewable Energy Corporation Limited.</p> <p>The CL is thus closed.</p>
CL 5	E.1.2	The power generation is from renewable solar power. It is	All the Power Purchase

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
<p>The PP is required to demonstrate as per the requirements of the methodology that power generation is from renewable solar power.</p>		<p>evident from the power purchase agreements signed between operators and respective electricity distribution agency board which clearly states that the plants are PV solar based power plants:</p> <ol style="list-style-type: none"> 1) Tayal & Co. Mohali and Haryana Power Purchase Centre dated 20 August 2010 for setting up of 1 MW solar PV project 2) RV Akash Ganga Infrastructure and UPCL dated 21 August 2010 for setting up of 2 MW solar PV project; Ref No. 970/UPCL/CGM (Com)/Solar 3) Gajanan Financial Services and Andhra Pradesh Central Power Distribution Company Limited dated 14 July 2010; Ref No.: MoU No. CGM/APCPDCL/ SOLAR - 04/2010 for setting up of 1 MW solar PV project 4) SDS Solar Pvt. Ltd and Haryana Power Purchase Centre dated 20 August 2010 for setting up of 1 MW solar PV project 5) Asian Aero-Edu Aviation Private Limited and JVVNL and JdVVNL and AVVNL dated 20 August 2010 for setting up of 1 MW solar PV project 6) Rays Power Private Limited and JVVNL and JdVVNL and AVVNL dated 16 August 2010 for 	<p>Agreements have been verified to confirm that the generation is from renewable solar power and that all of them are PV based.</p> <p>CL is thus closed.</p>

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
		<p>setting up of 1 MW solar PV project</p> <p>7) Soma Enterprise Ltd and Punjab State Power Corporation Limited dated 18 August 2010; Ref No. 499/IPC/303 for setting up of 1 MW solar PV project</p> <p>8) Vivek Pharmachem (India) Ltd and JVVNL and JdVVNL and AVVNL dated 16 August 2010 for setting up of 1 MW solar PV project; Ref No. RREC/NSM/RPSSGP/Rooftop</p> <p>9) Navbharat Buildcon Pvt Ltd and JVVNL and JdVVNL and AVVNL dated 16 August 2010 for setting up of 1 MW solar PV project</p> <p>10) Chandraleela Power Energy (P) Ltd and Haryana Power Purchase Centre dated 20 August 2010 for setting up of 0.8 MW solar PV project</p> <p>11) Basant Enterprises and JVVNL and JdVVNL and AVVNL dated 16 August 2010 for setting up of 1 MW solar PV project; Reference No. RREC/NSM/RPSSGP/Rooftop</p> <p>12) GS Atwal & Co (Engineers) Pvt. Ltd. And Punjab State Power Corporation Limited dated 18 August 2010; Reference No. 501/IPC/303 for setting up of 1.5 MW solar PV project</p>	

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
		13) AEW Infratech Pvt. Ltd and JVVNL and JdVVNL and AVVNL dated 16 August 2010 for setting up of 1 MW solar PV project; Reference No. RREC/NSM/RPSSGP/Rooftop/D. 9131	
<p>CL 6</p> <p>The PP needs to comply with the following monitoring methodology requirements</p> <ol style="list-style-type: none"> 1. Accuracy of the electricity meters (both main and check meter) in the PoA DD along with the calibration frequency. 2. Measuring and reporting frequency 3. Procedures related to data handling along with process performance checks. 	<p>E.10.5, E.10.6, E.10.7, E.10.8, E.10.9</p>	<p>The meters (both main and check meter) installed on-site will of minimum accuracy of 1% or 1s and will be calibrated atleast once a year. The same has been mentioned in revised PoA-DD</p> <p>The data (electricity generation) will be measured on a continuous basis and will be recorded monthly in log books. These can further be cross verified from the invoices/ meter readings issued by respective state electricity authorities.</p> <p>The data will be maintained in both electronic and paper formats. The data will be stored in following manner:</p> <ul style="list-style-type: none"> • A copy of data will be maintained in electronic and paper format on-site for anytime reference and validation • A copy of data will be stored in paper format by respective project operators in their head office in safe storage. • A copy of data will be submitted to SENES in electronic and paper format and will be maintained by SENES. 	<p>The PP has now mentioned the minimum accuracy of all electricity meters as 1% (1s) which is considered reasonable. The calibration frequency has now been mentioned as at least once a year, which is appropriate.</p> <p>It has now been mentioned that the electricity generation will now be measured continuously and recorded on a monthly basis in plant log-books.</p> <p>It has now been mentioned in revised PoA-DD that data will be maintained in both electronic and paper formats. A copy of data will also be submitted to SENES to maintain consistency.</p> <p>The CL is thus closed.</p>

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
<p>CL 7 The PP needs to respond to the stakeholder comment:</p> <p>The project is a very interesting initiative by SENES in Solar sector, however the managing entity should clarify the following: “Though the additionality of the project considering GBI or other such incentives would be mockery of GOI initiative to combat climate change, the managing entity is requested to conduct a financial analysis without GBI for a sample 1 MW solar power plant and present same in PoA DD to ascertain the robustness of additionality argument.”</p>		<p>The financial analysis has been conducted for 1MW as well as for the power plants with capacity of 2, 5, 10 and 15MW. From the financial analysis, it has been found that the NPV of power plants upto 15MW capacity remains negative.</p> <p>Results of financial analysis has been provided in revised PoA-DD and in excel sheet submitted for validation.</p>	<p>As requested by stakeholder, financial analysis has been conducted for 1, 2, 5, 10 and 15 MW capacities without taking into account the GBI incentives. Since the government policy on GBI came in 2010 under National Action Plan on Climate Change (NAPCC) 2008, it is found to be appropriate as per EB 22 guidance.</p> <p>The calculations have been verified to be correct from excel sheet.</p> <p>Thus the CL is closed.</p>
<p>CL 8</p> <p>The PP is requested to justify the appropriateness of all parameters used to calculate emission reductions in the Excel sheet and is reasonable as per VVM v1.2 paragraph 91.</p>	E.8.1	<p>The excel sheet with all the underlining assumptions have been provided to the validator:</p> <ul style="list-style-type: none"> • PLF has been taken as 19% from EPC quotations for various capacities • CO₂ Emission Factor has been calculated as per guidance given in “Tool to calculate the emission factor for an electricity system”, version 02 from CEA database, version 5; which is an official source of information in India. 	<p>The assumptions used while calculating emission reductions have been verified from various sources:</p> <ul style="list-style-type: none"> • PLF has been taken from quotations received from EPC providers for respective capacities, which have been verified • Emission factor has been verified from CEA database,

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
			<p>Version 5, November 2009 which was in force at the time of webhosting of PoA-DD.</p> <p>The CL is thus closed.</p>

Table 4 Forward action requests

Forward action request	Reference to Table 2	Response by project participants
Not applicable		

APPENDIX B

PROTOCOL FOR ASSESSING COMPLIANCE OF SPECIFIC CDM PROGRAMME ACTIVITIES WITH THE PROGRAMME OF ACTIVITIES

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
A. General description of CPA			This table (Appendix B) has been left blank intentionally and will be used for future CPA inclusions.		
A.1. Project boundaries					
A.1.1 Are the CPA's spatial boundaries (geographical) clearly defined, allowing the unique identification of the CPA?					
A.1.2 Are the CPA's system boundaries (components and facilities used to mitigate GHGs) clearly defined?					
A.1.3 Has it been demonstrated that the CPA is within the geographical borders of the PoA?					
A.1.4 Has it been confirmed that no part of the CPA is registered as a CDM project or included in another registered POA?					
A.2. Participation requirements					
A.2.1 Which Parties and CPA implementer are participating in the CPA? Are they included in the PoA?					
A.3. Duration of the CDM programme activity, Crediting Period					
A.3.1 Are the CPA's starting date and operational lifetime clearly defined and evidenced?					
A.3.2 Has the crediting period been clearly defined and is the start of the crediting period deemed to be reasonable?					
A.3.3 Has it been confirmed that the length of the CPA crediting period does not exceed the end of PoA?					
B. Eligibility of CPA and Estimation of Emission Reductions					

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.1. Eligibility criteria for CDM Programme Activities <i>It is assessed whether the CPA complies with the criteria for inclusion in the registered programme of activities.</i>					
B.1.1 Has it been sufficiently justified that the CPA complies with Eligibility criteria 1 of PoA to be described here					
B.1.2 Has it been sufficiently justified that the CPA complies with Eligibility criteria 2 of PoA to be described here					
B.1.3 Has it been sufficiently justified that the CPA complies with Eligibility criteria 3 of PoA to be described here					
B.2. Additionality <i>It is assessed whether the CPA complies with the eligibility criteria for demonstrating additionality of a CPA under the registered programme of activities.</i>					
B.2.1 Has it been sufficiently justified that the CPA complies with additionality criteria 1?					
B.2.2 Has it been sufficiently justified that the CPA complies with additionality criteria 2?					
B.2.3 Has it been sufficiently justified that the CPA complies with additionality criteria 3?					
B.3. Calculation of GHG Emission Reductions – Project emissions <i>It is assessed whether the project emissions are stated according to the methodology and the PoA-DD and whether the argumentation for the choice of default factors and values - where applicable – is justified.</i>					
B.3.1 Is the calculation of project emissions of the CPA in accordance with the procedure described in the					

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
PoA-DD?					
B.3.2 Are CPA-specific conservative assumptions used when calculating the project emissions?					
B.3.3 Are CPA-specific uncertainties in the project emission estimates properly addressed?					
B.4. Calculation of GHG Emission Reductions – Baseline emissions <i>It is assessed whether the baseline emissions are stated according to the methodology and the PoA-DD and whether the argumentation for the choice of default factors and values – where applicable – is justified.</i>					
B.4.1 Is the calculation of baseline emissions of the CPA in accordance with the procedure described in the PoA-DD?					
B.4.2 Are CPA-specific conservative assumptions used when calculating the baseline emissions?					
B.4.3 Are CPA-specific uncertainties in the baseline emission estimates properly addressed?					
B.5. Calculation of GHG Emission Reductions – Leakage <i>It is assessed whether leakage emissions are stated according to the methodology and the PoA-DD and whether the argumentation for the choice of default factors and values – where applicable – is justified.</i>					
B.5.1 Is the calculation of leakage emissions of the CPA in accordance with the procedure described in the PoA-DD?					
B.5.2 Are CPA-specific conservative assumptions used when calculating the leakage emissions?					
B.5.3 Are CPA-specific uncertainties in the leakage					

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
emission estimates properly addressed?					
B.6. Emission Reductions <i>The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change.</i>					
B.6.1 Has it been demonstrated that the total emission reductions of the CPA of activities will be real, measurable and give long-term benefits related to the mitigation of climate change					
B.7. Monitoring Methodology <i>It is assessed whether the CPA applies an appropriate monitoring methodology.</i>					
B.7.1 Is the monitoring plan for the CPA documented according to the approved methodology, in accordance with the programme of activities and in a complete and transparent manner?					
B.7.2 Will all monitored data required for verification and issuance be kept for two years after the end of the crediting period or the last issuance of CERs, for this programme, whichever occurs later?					
B.8. Data and Parameters Available at Validation <i>It is established whether appropriate values were selected for parameters determined ex-ante.</i>					
B.8.1 Does the applied methodology allow determining the selected values <i>ex-ante</i> ?					
B.8.2 Have adequate assumptions been used for determining the values and are underlying calculations correct?					
B.8.3 Has sufficient documentary evidence been presented to verify the selected values or to verify the input data used in the calculation of the values					

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
of the parameters determined <i>ex-ante</i> .					
B.9. Ex-Post Monitoring <i>It is established whether the monitoring plan provides for reliable and complete emission data over time.</i>					
B.9.1 Does the monitoring plan provide for the collection and archiving of all relevant data necessary for estimation or measuring the greenhouse gas emissions within the CPA boundary during the crediting period?					
B.9.2 Are the choices of CPA GHG indicators reasonable and conservative?					
B.9.3 Is the measurement method clearly stated for each GHG value to be monitored and deemed appropriate?					
B.9.4 Is the measurement equipment described and deemed appropriate?					
B.9.5 Is the measurement accuracy addressed and deemed appropriate? Are procedures in place on how to deal with erroneous measurements?					
B.9.6 Is the measurement <i>interval</i> identified and deemed appropriate?					
B.9.7 Is the <i>registration, monitoring, measurement and reporting</i> procedure defined?					
B.9.8 Are procedures identified for <i>maintenance</i> of monitoring equipment and installations? Are the calibration intervals being observed?					
B.9.9 Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)					

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.10. CPA Management Planning <i>It is checked that programme implementation is properly prepared for and that critical arrangements are addressed.</i>					
B.10.1 Is the authority and responsibility of overall CPA management clearly described?					
B.10.2 Are procedures identified for training of monitoring personnel?					
B.10.3 Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?					
B.10.4 Are procedures identified for review of reported results/data?					
B.10.5 Are procedures identified for corrective actions in order to provide for more accurate future monitoring and reporting?					
C. Environmental impacts <i>It is assessed whether environmental impacts of the CPA have been properly addressed.</i>			<input type="checkbox"/> Analysis at PoA level <input type="checkbox"/> Analysis at CPA level This section must only be completed if the analysis of environmental impacts must be at CPA level.		
C.1.1. Has an analysis of the environmental impacts of the CPA been sufficiently described?					
C.1.2. Are there any Host Party requirements for an Environmental Impact Assessment (EIA)?					
C.1.3. Will the programme create any adverse					

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
environmental effects?					
C.1.4. Are transboundary environmental impacts considered in the analysis?					
C.1.5. Have identified environmental impacts been addressed in the programme design?					
C.1.6. Does the programme comply with environmental legislation in the host country?					
D. Stakeholders' comments <i>It is assessed whether stakeholders have been properly consulted in the development of the CPA.</i>			<input type="checkbox"/> Consultation at PoA level <input type="checkbox"/> Consultation at CPA level This section must only be completed if the analysis of environmental impacts is at PoA level.		
D.1.6. Have relevant stakeholders been consulted?					
D.1.7. Have appropriate media been used to invite comments by local stakeholders?					
D.1.8. If a stakeholder consultation process is required by regulations/laws in the host country, has the stakeholder consultation process been carried out in accordance with such regulations/laws?					
D.1.9. Is a summary of the stakeholder comments received provided?					
D.1.10. Has due account been taken of any stakeholder comments received?					

Table 5 Resolution of corrective action requests and clarification requests

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
Not Applicable			

Table 6 Forward action requests

Forward action request	Reference to Table 2	Response by project participants
Not Applicable		

APPENDIX C

CURRICULA VITAE OF THE VALIDATION TEAM MEMBERS

Nitin Kapoor holds a Bachelor in Chemical Engineering and is also a qualified Chartered Financial Analyst (CFA) He has an overall experience of 15 years and 6 months as on date. Prior to joining DNV he had experience of 10 years and 5 months in Oil & Gas as well as manufacturing sector (food) with leading MNC's like ITC, Coca Cola and Enron Oil and Gas. During his stint in industry his responsibilities included carrying out energy audits and to identify potential areas of improvement. His experience includes analysis of specific consumptions (primarily on energy, raw materials and utilities) of processes based on historical data, carrying out material balances (heat and mass), analysis of equipment performance and identification and measurement of energy saving opportunities. He has also been responsible for the operations of the complete Crude Distillation Unit in the refinery, complete platform operations in Oil and Gas sector as well as for the utilities like steam, AHU while in Maintenance at ITC. He also has been incharge of the ETP operations in Coca Cola and ITC as well as Water and Sewage treatment plants while working offshore. He has been responsible for EMS and QMS at ITC and Coca Cola.

He has experience of 3.5 years in validation and verification of numerous CDM projects within DNV. He has received extensive training in the CDM validation and verification process. He is an appointed validator for the CDM validation and verification program of DNV and has performed validation of several CDM projects. He is also a Lead Auditor for QMS, auditor for EMS and Safety. His qualification, industrial experience and project experience in CDM demonstrate his sufficient sectoral competence in Energy Generation from renewable energy sources, energy efficiency, heat and energy demand and waste/waste water treatment. His direct work experience in Oil and Gas and food sector demonstrates his sectoral competence in these industries.

Mr G N Agrawal is a graduate in Mechanical Engineering from IIT Kanpur with post graduation in Business Management from Faculty of Management Studies, Delhi. He has over 35 years of experience in the areas of installation, commissioning, Operation and Maintenance of coal, agrifuel and waste heat recovery cogeneration power plants. He had been instrumental in the Preparation of detailed feasibility report and getting these approved with the leading financial institutions including Power Finance Corporation and SDF for the financing of 12 MW and 75 MW Bagasse based cogeneration projects for the three sugar plants of Mawana Sugars Ltd. Over the years he has gained in-depth knowledge of the Technical, Financial and Regulatory aspects of power generation business, Energy Efficiency, Energy Management and Energy Conservation. Under his guidance five projects under Clean Development Mechanism were identified . Extensive study was carried out to prove additionally. Registration of all the projects was successfully achieved with UNFCCC having a potential of generating 0.18 million Carbon Credits per annum. He has presented many papers at National and International conferences on Renewable Energy, Energy Efficiency and Sustainable Development. His direct work experience in power sector demonstrate his sectoral competence in Thermal energy generation from fossil fuels and biomass including thermal electricity from solar.

Mr Simon Wong Yon Sing holds a Bachelor's Degree in Chemical Engineering with Environmental Engineering, with a year experience in the field of design and operation/maintenance of wastewater treatment as part of working in wastewater design & equipment supply services.

His experience in designing and maintaining the wastewater treatment systems covers the fields of various manufacturing and chemical industries in Malaysia. He has experience of more than 4 years in validation and verification of numerous CDM projects in DNV, both in Malaysia and abroad. His qualification, industrial experience and experience in CDM demonstrate his sufficient sectoral competence in “Energy Generation from Renewable Energy Sources”, “Waste Handling and Disposal” and “Animal Waste Management System”.