# VALIDATION REPORT

## 24 MW DUMMAGUDEM HYDEL PROJECT BY SLS POWER CORPORATION LIMITED

## M/S SLS POWER CORPORATION LIMITED

**Report No: 8106692657- 10/133**

**Date: 2011-06-28**

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|---|---|---|---|---|
| **Validation Report:** | ***Report No.*** | ***Rev. No.*** | ***Date of 1st issue:*** | ***Date of this rev.*** |
| | **8106692657- 10/133** | 1 | 2011-05-12 | 2011-06-28 |
| **Project:** | ***Title:*** | | ***Initial PDD Version:*** | ***Final PDD Version*** |
| | 24 MW Dummagudem Hydel project by SLS Power Corporation Limited | | 2009-12-10 | 2011-06-20 |
| **Client:** | M/s SLS Power Corporation Limited | | ***Client ref:*** | Mr. Jayachandra Reddy (Joint Managing Director) |
| **Project Participant(s):** | ***Host Party:*** | | ***Other involved parties:*** | |
| | India | | N/A | |
| **Applied methodology/ies:** | ***Title:*** | | ***No.:*** | ***Scope / TA:*** |
| | Consolidated baseline methodology for grid-connected electricity generation from renewable sources | | ACM0002 ver.12.1.0 | 1 / 1.2 |
| **Validation team / Technical Review and Final Approval** | ***Validation Team:*** | | ***Technical review:*** | ***Final approval:*** |
| | Mr. Manojkumar Borekar(TL)<br>Mr. Prasad Jakkaraju (TE/TM)<br>Mr. Jimmy Sah (TM)<br>Mr. Sukanta Das (TM)<br>Mr. Ajay Singh Thakur (OT) | | Ms. Sabine Meyer<br>Mr. Klein Ingo | Martin Saalmann |
| **Expected Emission reductions: [t $CO_2e$]** | ***Expected emission reductions over the first crediting period:*** | | ***Expected date of crediting period:*** | |
| | 892670t $CO_{2e}$ | | 2011-08-01 | |
| ***Confidential content:*** | ☐ Yes | | ☒ No | |
| **Summary of Validation Opinion:** | ☒ Positive validation opinion | | ☐ Negative validation opinion | |

M/S SLS Power Corporation Limited has commissioned the TÜV NORD JI/CDM Certification Program (CP) to validate the project: "24 MW Dummagudem Hydel project by SLS Power Corporation Limited" with regard to the relevant requirements of the UNFCCC for CDM project activities, as well as criteria for consistent project operations, monitoring and reporting. UNFCCC criteria include article 12 of the Kyoto Protocol, the modalities and procedures for CDM (Marrakech Accords) and the relevant decisions by COP/MOP and CDM Executive Board

In the course of the pre-validation 19 Corrective Action Requests (CARs) ,17 Clarification Requests (CLs) and 1 FAR were raised and successfully closed.

The review of the project design documentation and additional documents related to baseline and monitoring methodology; the subsequent background investigation, follow-up interviews and review of comments by parties, stakeholders and NGOs have provided TÜV NORD JI/CDM CP with sufficient evidence to validate the fulfilment of the stated criteria.

In detail the conclusions can be summarised as follows:

- The project is in line with all relevant host country criteria (India) and all relevant UNFCCC requirements for CDM. Project activity approval have been obtained from DNA of India vide the Letter of Approval (HCA) dated 18th August 2010.
- The project additionality is sufficiently justified in the PDD.
- The monitoring plan is transparent and adequate.
- The calculation of the project emission reductions is carried out in a transparent and conservative manner, so that the calculated emission reductions of 892670 $tCO_2e$ are most likely to be achieved within the 10 year fixed crediting period.

| | | |
|---|---|---|
| | The conclusions of this report show, that the project, as it was described in the project documentation, is in line with all criteria applicable for the validation. | |
| **Document information:** | *Filename:* | *No. of pages:* |
| | 2011-06-28_FVR_10/133_clean version | 171 |

## Abbreviations

| | |
|---|---|
| **APERC** | Andhra Pradesh Electricity Regulatory Commission |
| **BAU** | Business as usual |
| **CA** | Corrective Action / Clarification Action |
| **CAR** | Corrective Action Request |
| **CDM** | Clean Development Mechanism |
| **CL** | Clarification Request |
| **$CO_2$** | Carbon dioxide |
| **$CO_{2e}$** | Carbon dioxide equivalent |
| **CP** | Certification Program |
| **DNA** | Designated National Authority |
| **EB** | CDM Executive Board |
| **EIA** | Environmental Impact Assessment |
| **FA** | Finance Act |
| **FAR** | Forward Action Request |
| **IPCC** | Intergovernmental Panel on Climate Change |
| **IREDA** | Indian Renewable Energy Development Agency |
| **IT act** | Income Tax act |
| **MoEF** | Ministry of Environment and Forests |
| **OM** | Operation and Maintenance |
| **PDD** | Project Design Document |
| **PLF** | Plant Load Factor |
| **PLR** | Prime Lending Rate |
| **QC/QA** | Quality control/Quality assurance |
| **RBI** | Reserve Bank of India |
| **RLDC** | Regional Load Dispatch Centre |
| **RPC** | Regional Power Committees |
| **TCE** | TECSOL Engineers Pvt Ltd |
| **UNFCCC** | United Nations Framework Convention on Climate Change |
| **VVM** | Validation and Verification Manual |

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# 1 OBJECTIVE / SCOPE

The purpose of a validation is to have an independent third party assess the project design. In particular the project's baseline, the monitoring plan (MP), and the project's compliance with

- the requirements of Article 12 of the Kyoto Protocol;
- the CDM modalities and procedures as agreed in the Marrakech Accords under decision 3/CMP.1
- the annex to the decision;
- subsequent decisions made by COP/MOP & CDM Executive Board and
- other relevant rules, including the host country legislation and sustainability criteria

are validated in order to confirm that the project design as documented is sound and reasonable and meets the stated requirements and identified criteria. Validation is seen as necessary to provide assurance to stakeholders on the quality of the project and its intended generation of certified emission reductions (CERs).

The validation scope is given as a thorough independent and objective assessment of the project design including especially: the correct application of the methodology, the project's baseline study, additionality justification, local stakeholder commenting process, environmental impacts and monitoring plan, which are included in the PDD and other relevant supporting documents, to ensure that the proposed CDM project activity meets all relevant and applicable CDM criteria.

The information included in the PDD and the supporting documents were reviewed against the requirements as set out by the UNFCCC. The validation team has, based on the requirements in the Validation and Verification Manual[/VVM/], carried out a full assessment of all evidences to assess the compliance of the project with the key areas as outlined in section V.E. and V.F. of the VVM (version 01.2, EB 55).

The validation is based on the information made available to TÜV NORD JI/CDM CP and on the contract conditions. TÜV NORD JI/CDM CP cannot be held liable by any entity for making its validation opinion based on any false or misleading information supplied to it during the course of validation.

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

# 2 GHG PROJECT DESCRIPTION

## 2.1 Project Characteristics

Essential data of the project is presented in the following Table 2-1.

**Table 2-1:** Project Characteristics

| Item | Data | | |
|---|---|---|---|
| Project title | 24 MW Dummagudem Hydelvproject by SLS Power Corporation Limited | | |
| Project size | ☒ Large Scale ☐ Small Scale | | |
| Project Scope *(according to UNFCCC sectoral scope numbers for CDM)* | ☒ | 1 | Energy Industries (renewable- /non-renewable sources) |
| | ☐ | 2 | Energy distribution |
| | ☐ | 3 | Energy demand |
| | ☐ | 4 | Manufacturing industries |
| | ☐ | 5 | Chemical industry |
| | ☐ | 6 | Construction |
| | ☐ | 7 | Transport |
| | ☐ | 8 | Mining/Mineral production |
| | ☐ | 9 | Metal production |
| | ☐ | 10 | Fugitive emissions from fuels (solid, oil and gas) |
| | ☐ | 11 | Fugitive emissions from production and consumption of halocarbons and hexafluoride |
| | ☐ | 12 | Solvents use |
| | ☐ | 13 | Waste handling and disposal |
| | ☐ | 14 | Afforestation and Reforestation |
| | ☐ | 15 | Agriculture |
| Applied Methodology | *ACM002 Version 12.1.0* | | |
| Technical Area(s) | 1.2: Renewables - Hydro | | |
| Crediting period | ☐ Renewable Crediting Period (7 y)<br>☒ Fixed Crediting Period (10 y) | | |
| Start of crediting period[1] | 2010/06/30 | | |
| Start of crediting period[2] | 2011/10/01 | | |

## 2.2 Involved Parties and Project Participants

The following parties to the Kyoto Protocol and project participants are involved in this project activity (Table 2-2).

**Table 2-2:** Project Parties and project participants

| Characteristic | Party | Project Participant |
|---|---|---|
| Host party | India | M/S SLS Power Corporation Limited |
| Other involved party/ies | - | - |

[1] Based on the web hosted PDD, version 1
[2] Based on the revised PDD, versions 2

## 2.3 Project Location

The details of the project location are given in table 2-3:

**Table 2-3:** Project Location

| No. | Project Location |
|---|---|
| Host Country | India |
| Region: | Hyderabad |
| Project location address: | left flank of the branch anicut in the Godavari River at Dummugudem District- Khammam, Nearest Railway station Kottagudem |
| Latitude: | 80° 53' 12" E |
| Longitude: | 17° 51' 19" N |

## 2.4 Technical Project Description

The project activity involves installation of six Horizontal Pit Type Full Kaplan turbine & generation capacity of each generator is 4 MW to generate 24 MW of power utilizing a rated head of 4.8 m and design discharge of 601.02 $m^3$.

It is proposed to generate the power at 11 kV and will be stepped up to 132 kV at the Powerhouse switchyard to evacuate the 24MW of power generated and power will be transmitted through a 132kV double circuit line is proposed with PANTHER ACSR conductor strung on 132 KV DC tower. The outgoing line will be provided with breakers and required line protection system will be terminated at the proposed 132/11 kV Bhadrachalam substation 20km from site. Suitable metering arrangement will be proposed at the switchyard as per the stipulation for metering the energy evacuated to Andhra Pradesh grid.

The gross energy estimated based on the 12 year gauged data is worked out to 103400 MWh. Considering the auxilary consumption, transmission loss up to substation and grid outage 3% is considered in transmission. The net saleable electricity works out 100300 MWh and the same is considred for finanical calculation.

The synchronous generator shall include Horizontal Shaft Alternating Current, synchronous generator of capacity 4000 kW, 0.85 PF, 11 kV, 50 Hz at site condition of 40 Deg.C ambient, brushless exciter, automatic voltage regulators, neutral grounding cubicle, lightning and surge protection panel, protection relay system cooling water system, instrumentation control and safety devices and other accessories, spares and special tools that will be required for satisfactory and efficient operation of the Station.

The generator is to be coupled to the turbine through speed increaser matched in respect of speed, runaway speed, moment of inertia, overload capacities, coupling and other relevant requirements. The generator first critical speed should be greater than 125% of the runaway speed.

The DG set will be back up to be used to start up the generators in case of station shut down coupled with failure of the grid supply from the 132/11 kV line. The rating of D.G. will be 250 KVA.

The project activity is expected to generate approximately 100300 MWh of electricity per year. This power from GHG free source will displace power from state grid which is primarily fossil fuel based and hence will effect reduced emissions in power generation from southern grid connected power stations. The estimated amount of emission reductions over the chosen 10-year "fixed crediting period" for the project activity is 892670 $tCO_{2e}$.

The technical key data are provided in table 2-4 below

**Table 2-4:** Technical data of the project activity

| Parameter | Unit | Value |
|---|---|---|
| Net head | Meter | 4.8 |
| Maximum head | Meter | 5.6 |
| Minimum head | Meter | 2.5 |
| Capacity | MW | (6X4MW=24) |
| Design Discharge | Cumecs | 600 |
| Type of switchgear (air insulated switchgear) | kV | 11/132 |
| Speed of turbine | rpm | 111 |
| Generation voltage | kV | 11 |
| Transmission voltage | kV | 132 |
| GSU transformer (3 Phase) | MVA | 20 |
| Catchment Area at the diversion site | $Km^3$ | 307 |

# 3 METHODOLOGY AND VALIDATION SEQUENCE

## 3.1 Validation Steps

The validation of the project consisted of the following steps:

- Contract review
- Appointment of team members and technical reviewers
- Publication of the project design document (PDD)
- Desk review of the PDD and supporting documents
- Validation planning
- On-Site assessment
- Background investigation and follow-up interviews with personnel of the project developer and its contractors
- Draft validation reporting
- Resolution of corrective actions (if any)
- Final validation reporting
- Technical review
- Final approval of the validation

The sequence of the validation is given in the table 3.1 below:

**Table 3.1:** Validation sequence

| Topic | Time |
|---|---|
| Assignment of validation | 2010/04/01 |
| Submission of PDD for global stakeholder commenting process | 2010/04/10 to 2010/05/09 |
| On-site visit | 2010/05/11 |
| Draft reporting finalised | 2010/05/31 |
| Final reporting finalised | 2011/06/28 |
| Technical review on final reporting finalised | 2011/06/28 |

## 3.2 Contract review

To assure that

- the project falls within the scopes for which accreditation is held,
- the necessary competences to carry out the validation can be provided,
- Impartiality issues are clear and in line with the CDM accreditation requirements

a contract review was carried out before the contract was signed.

## 3.3 Appointment of team members and technical reviewers

On the basis of a competence analysis and individual availabilities a validation team, consistent of one team leader and 2 additional team members, were appointed. Furthermore also the personnel for observation, the technical review and the final approval were determined.

The list of involved personnel, the tasks assigned and the qualification status are summarized in the table 3-2 below.

**Table 3-2:** Involved Personnel

| | Name | Company | Function [1] | Qualification Status [2] | Scheme competence [3] | Technical competence [4] | Verification competence [5] | Host country Competence | Team Leading competence |
|---|---|---|---|---|---|---|---|---|---|
| ☒ Mr. ☐ Ms. | Manojkumar Borekar | TUV India Pvt Limited | TL | SA | ☒ | - | ☐ | ☒ | ☒ |
| ☒ Mr. ☐ Ms. | Prasad Jakkaraju | TUV India Pvt Limited | TM[A)] | LA | ☒ | S | ☐ | ☒ | ☒ |
| ☒ Mr. ☐ Ms. | Jimmy Sah | TUV India Pvt Limited | TM[A)] | LA | ☒ | - | ☐ | ☒ | ☒ |
| ☒ Mr. ☐ Ms. | Sukanta Das | TUV India Pvt Limited | TM[A)] | LA | ☒ | - | ☐ | ☒ | ☒ |
| ☒ Mr. ☐ Ms. | Ajay Singh Thakur | TUV India Pvt Limited | OT[B)] | T | ☐ | - | ☐ | ☒ | ☐ |

| | Name | Company | Function [1] | Qualification Status [2] | Scheme competence [3] | Technical competence [4] | Verification competence [5] | Host country Competence | Team Leading competence |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |
| ☐ Mr.<br>☒ Ms. | Sabine Meyer | TUV NORD CERT | TR[B] | A | ☒ | - | ☐ | ☐ | ☐ |
| ☒ Mr.<br>☐ Ms. | Ingo Klein | TUV NORD CERT | TR[B] | LA | ☒ | 1.2 | ☒ | ☐ | ☒ |
| ☒ Mr.<br>☐ Ms. | Martin Saalmann | TUV NORD CERT | FA[B] | SA | ☒ | - | ☐ | ☐ | ☒ |

1) TL: Team Leader; TM: Team Member, TR: Technical review; OT: Observer-Team, OR: Observer-TR; FA: Final approval

2) GHG Auditor Status: A: Assessor; LA: Lead Assessor; SA: Senior Assessor; T: Trainee; TE: Technical Expert

3) GHG auditor status (at least Assessor)

4) As per S01-MU03 or S01-VA070-A2 (such as 1.1, 1.2, …)

5) In case of verification projects

A) Team Member: GHG auditor (at least Assessor status), Technical Expert (incl. Host Country Expert or Verification Expert), not ETE

B) No team member

Certificates of appointment for the above mentioned team members are enclosed in annex 6 of this report.

## 3.4 Consideration of Public Stakeholder Comments

Acc. to the modalities and procedures the draft PDD, as received from the project participants, has been made publicly available on the dedicated UNFCCC CDM website prior to the validation activity commenced. Stakeholders have been invited to comment on the PDD within the 30 days public commenting period.

In case comments are received, they are taken into account during the validation process. The comments and the discussion of the same are documented in annex 5 of this report.

## 3.5 Validation Protocol

In order to ensure consideration of all relevant assessment criteria, a validation protocol is used. The protocol shows, in a transparent manner, criteria and requirements, means of validation and the results from pre-validating the identified criteria. The validation protocol reflects the generic CDM requirements each CDM project has to meet as well as project specific issues as applicable. The validation protocol serves the following purposes:

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

The validation protocol is described in Figure 1.

| ***Validation Protocol Table A-1: Requirement checklist*** | | | | |
|---|---|---|---|---|
| ***Checklist Item*** | ***Validation Team Comment*** | ***Reference*** | ***Draft Conclusion*** | ***Final Conclusion*** |
| *The checklist items in Table A-1 are linked to the various requirements the project should meet. The checklist is organised in various sections. Each section is then further sub-divided as per the requirements of the topic and the individual project activity.* | *The section is used to elaborate and discuss the checklist item in detail. It includes the assessment of the validation team and how the assessment was carried out. The reporting requirements of the VVM shall be covered in this section.* | *Gives reference to the information source on which the assessment is based on* | *Assessment based on evidence provided if the criterion is fulfilled (OK), or a CAR, CL or FAR (see below) is raised. The assessment refers to the draft validation stage.* | *In case a corrective action or a clarification the final assessment at the final validation stage is given.* |

**Figure 1:** Validation protocol table

The completed validation protocol is enclosed in Annex 1 to this report.

## 3.6 Review of Documents

The published PDD (version 1) and supporting background documents related to the project design and baseline were reviewed.

Furthermore, the validation team used additional documentation by third parties like host party legislation, technical reports referring to the project design or to the basic conditions and technical data.

## 3.7 Follow-up Interviews

The validation team has carried out interviews in order to assess the information included in the project documentation and to gain additional information regarding the compliance of the project with the relevant criteria applicable for CDM.

During validation the validation team has performed interviews to confirm selected information and to resolve issues identified in the document review. The main topics of the interviews are summarized in table 3-3.

**Table 3-3:** Interviewed persons and interview topics

| Interviewed Persons / Entities | Interview topics |
|---|---|
| Project proponent representatives<br>Project consultant | - Chronological description of the project activity with documents of key steps of the implementation.<br>- Current status of plant design<br>- Technical details of the project realization, project feasibility, designing, operational life time, monitoring of the project<br>- Host Government Approval<br>- Approval procedures and status<br>- Monitoring and measurement equipment and system.<br>- Financial aspects<br>- Crediting period<br>- Project activity starting date<br>- CER allocation / ownership<br>- Baseline study assumptions<br>- Additionality<br>- Sustainable development issues<br>- Monitoring<br>- Analysis of local stakeholder consultation<br>- Roles & responsibilities of the project participants w.r.t. project management, monitoring and reporting<br>- National Legislation<br>- Editorial issues of the PDD |

A comprehensive list of all interviewed persons is part of section 7 ‘References’.

## 3.8 Project comparison

The validation team has compared the proposed CDM project activity with similar projects or technology that have similar or comparable characteristics and with similar projects in the host country in order to achieve additional information esp. regarding:

- Project technology

- Additionality issues
- Reasons for reviews, requests for reviews and rejections within the CDM registration process.

## 3.9 Resolution of Clarification and Corrective Action Requests

### 3.9.1 Definition

A **Corrective Action Request (CAR)** will be established where:

- mistakes have been made in assumptions, application of the methodology or the project documentation which will have a direct influence the project results,
- the requirements deemed relevant for validation of the project with certain characteristics have not been met or
- there is a risk that the project would not be registered by the UNFCCC or that emission reductions would not be able to be verified and certified.

A **Clarification Request (CL)** will be issued where information is insufficient, unclear or not transparent enough to establish whether a requirement is met.

A **Forward Action Request (FAR)** will be issued when certain issues related to project implementation should be reviewed during the first verification.

### 3.9.2 Draft Validation

After reviewing all relevant documents and taken all other relevant information into account, the validation team issues all findings in the course of a draft validation report and hands this report over to the project proponent in order to respond on the issues raised and to revise the project documentation accordingly.

### 3.9.3 Final Validation

The final validation starts after issuance of the proposed corrective action (CA) of the CARs CLs and FARs by the project proponent. The project proponent has to reply on those and the requests are “closed out” by the validation team in case the response is assessed as sufficient. In case of raised FARs the project proponent has to respond on this, identifying the necessary actions to ensure that the topics raised in this finding are likely to be resolved at the latest during the first verification. The validation team has to assess whether the proposed action is adequate or not.

In case the findings from CARs and CLs cannot be resolved by the project proponent or the proposed action related to the FARs raised cannot be assessed as adequate, no positive validation opinion can be issued by the validation team.

The CAR(s) / CL(s) / FAR(s) are documented in chapter 4.

## 3.10 Technical review

Before submission of the final validation report a technical review of the whole validation procedure is carried out. The technical reviewer is a competent GHG auditor being appointed for the scope this project falls under. The technical reviewer is not considered to be part of the validation team and thus not involved in the decision making process up to the technical review.

As a result of the technical review process the validation opinion and the topic specific assessments as prepared by the validation team leader may be confirmed or revised. Furthermore reporting improvements might be achieved.

## 3.11 Final approval

After successful technical review of the final report an overall (esp. procedural) assessment of the complete validation will be carried out by a senior assessor located in the accredited premises of TÜV NORD.

Only after this step the request for registration can be started (in case of a positive validation opinion).

# 4 VALIDATION FINDINGS

In the following table the findings from the desk review of the published PDD, visits, interviews and supporting documents are summarised**:**

**Table 4-1:** Summary of CARs, CLs and FARs issued

| Validation topic [1)] | No. of CAR | No. of CL | No. of FAR |
|---|---|---|---|
| General description of project activity (A)<br>- Project specification<br>- Technical project description<br>- Participation<br>- Contribution to sustainable development<br>- PDD editorial aspects<br>- Technology to be employed | 3 | - | - |
| Project Baseline, Additionality and Monitoring Plan (B)<br>- Application of the Methodology<br>- Project Boundary<br>- Baseline identification<br>- Calculation of GHG emission reductions<br>Project emissions<br>Baseline emissions<br>Leakage<br>- Additionality determination<br>- Monitoring Methodology<br>- Monitoring Plan<br>- Project management planning | 15 | 17 | 1 |
| Duration of the Project / Crediting Period (C) | 1 | - | - |
| Environmental impacts (D) | - | - | - |
| Stakeholder Comments (E) | - | - | - |
| **SUM** | **19** | **17** | **1** |

[1)] The letters in brackets refer to the validation protocol

The following tables include all raised CARs, CLs and FARs. For an in depth evaluation of all validation items it should be referred to the validation protocols (see Annex 1).

The findings of validation process are summarized in the tables below.

| General | CAR A1 | | |
|---|---|---|---|
| **Classification** | ☒ CAR | ☐ CL | ☐ FAR |
| **Description of finding** *Describe the finding in unambiguous style; address the context (e.g. section)* | The Host Country approval has not yet obtained. This document is prerequisite for registration. The same needs to be submitted. | | |
| **Corrective Action #1** *This section shall be filled by the PP. It shall address the corrective action taken in details.* | The Host Country Approval was received on 18/08/2010 and has now been submitted to the DOE. | | |
| **DOE Assessment #1** *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.* | The Host country Approval for the project activity furnished by the project proponent. The same has been cross checked by the assessment team and found it correct. The PP name and project title is consistent with PDD. Hence the CAR is closed. | | |
| **Conclusion** *Tick the appropriate checkbox* | ☐ To be checked during the first periodic verification<br>☐ Appropriate action was taken<br>☒ Project documentation was corrected correspondingly<br>☐ Additional action should be taken<br>☒ The project complies with the requirements | | |

| General | CAR A2 | | |
|---|---|---|---|
| **Classification** | ☒ CAR | ☐ CL | ☐ FAR |
| **Description of finding** *Describe the finding in unambiguous style; address the context (e.g. section)* | Section A.2 & Section A.4.3 of the PDD is incomplete with respect to following: (Refer CDM PDD filling guidelines)<br>• The scenario existing prior to the start of the implementation of the project activity;<br>• The project scenario, including a summary of the scope of activities/measures, a list of the equipment(s) and systems that will be installed with technical details that are being implemented within the proposed project activity; | | |
| **Corrective Action #1** *This section shall be filled by the PP. It shall address the corrective action taken in details.* | Section A.2 and A.4.3 of the PDD have been revised as per the CDM PDD filling guidelines. | | |
| **DOE Assessment #1** *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.* | Section A.2 & Section A.4.3 of the PDD have been revised as per the CDM PDD filling guideline. Same has been checked by the validation team and found correct. Thus, CAR is closed | | |
| **Conclusion** *Tick the appropriate checkbox* | ☐ To be checked during the first periodic verification<br>☐ Appropriate action was taken<br>☒ Project documentation was corrected correspondingly<br>☐ Additional action should be taken<br>☒ The project complies with the requirements | | |

| Project Baseline, Additionality | CAR A3 | | |
|---|---|---|---|
| **Classification** | ☒ CAR | ☐ CL | ☐ FAR |
| **Description of finding** *Describe the finding in unambiguous style; address the context (e.g. section)* | PP has chosen fixed crediting period, while section A.4.4 of the PDD indicates the seven year renewable crediting period. | | |
| **Corrective Action #1** *This section shall be filled by the PP. It shall address the corrective action taken in details.* | This was a typing error and has been corrected in the revised PDD submitted to the DOE. | | |
| **DOE Assessment #1** *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.* | The correction has been made accordingly in revised PDD. Thus, CAR is closed | | |
| **Conclusion** *Tick the appropriate checkbox* | ☐ To be checked during the first periodic verification<br>☐ Appropriate action was taken<br>☒ Project documentation was corrected correspondingly<br>☐ Additional action should be taken<br>☒ The project complies with the requirements | | |

| Project Baseline, Additionality | CAR B1 | | |
|---|---|---|---|
| **Classification** | ☒ CAR | ☐ CL | ☐ FAR |
| **Description of finding** *Describe the finding in unambiguous style; address the context (e.g. section)* | PP is requested to follow step 1 (pg 4/19) of ACM002 version 12.1.0 to identify realistic and credible alternative baseline scenarios for power generation.<br>Further, Section B.4 of the PDD should contain a transparent and detailed description of the identified baseline scenario, including a description of the technology that would be employed and/or the activities that would take place in the absence of the proposed project activity.<br>(Provide relevant documentation or references. Illustrate in a transparent manner all data used to determine the baseline scenario) (variables, parameters, data sources etc.). (Refer CDM PDD filling guidelines) | | |
| **Corrective Action #1** *This section shall be filled by the PP. It shall address the corrective action taken in details.* | Section B.4 of the PDD has now been revised as per the CDM PDD filling guidelines. | | |
| **DOE Assessment #1** *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.* | The baseline scenario for the project activity has been identified as per the step 1 of the ACM0002 version 12.1.0 (identification of baseline scenario). Further, continuation of the current situation is identified as baseline scenario and the detailed description regarding technology that would be employed and/or the activities that would take place in the absence of the proposed project activity have been mentioned in the section B.4 of the PDD. The references | | |

| Project Baseline, Additionality | CAR B1 |
|---|---|
| | used to determine baseline scenario also mentioned in section B.4 of the revised PDD.<br><br>The revised PDD has been checked by the assessment team and found in line with step 1 (pg 4/19) of ACM002 version 12.1.0 and CDM PDD filling guideline. Hence, CAR is closed. |
| **Conclusion**<br>*Tick the appropriate checkbox* | ☐ To be checked during the first periodic verification<br>☒ Appropriate action was taken<br>☒ Project documentation was corrected correspondingly<br>☐ Additional action should be taken<br>☒ The project complies with the requirements |

| Project Baseline, Additionality | CAR B2 | | |
|---|---|---|---|
| **Classification** | ☒ CAR | ☐ CL | ☐ FAR |
| **Description of finding**<br>*Describe the finding in unambiguous style; address the context (e.g. section)* | Footnote 1 of the ACM0002 version 12.1.0 has to be substantiated in the PDD with detailed justification. | | |
| **Corrective Action #1**<br>*This section shall be filled by the PP. It shall address the corrective action taken in details.* | The project activity is a run of the river hydro, there is no question of implementing a reservoir. Hence, footnote 1 need not be justified in detail. However, a note regarding the same has been inserted in section B.2 of the PDD (footnote 2 of the PDD). The Tail race pond present in the project activity is not a reservoir, it only collects the water flowing out from the power house and is not a source of water inflow for the power house. Further, the power density is 192 W/$m^2$ which is greater than 4W/$m^2$. Thus, the project is applicable under the chosen methodology. | | |
| **DOE Assessment #1**<br>*The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.* | Though the power density is not required for this project activity as it is run of river, PP wished to submit the same. As the project activity is a run of the river hydro power plant with a tail race pond (not a new reservoir an increase in the existing reservoir) and the power density is 192 W/m2 which is greater than 4W/m2. Same has been observed during the site visit and interview with the PP. Thus, the Foot note 1 of the ACM0002 version 12.1.0 is not required to detail out in section B.2 of the PDD.<br>Hence, the CAR is closed. | | |
| **Conclusion**<br>*Tick the appropriate checkbox* | ☐ To be checked during the first periodic verification<br>☒ Appropriate action was taken<br>☒ Project documentation was corrected correspondingly<br>☐ Additional action should be taken<br>☒ The project complies with the requirements | | |

| Project Baseline, Additionality | CAR B3 | | |
|---|---|---|---|
| **Classification** | ☒ CAR | ☐ CL | ☐ FAR |
| **Description of finding** *Describe the finding in unambiguous style; address the context (e.g. section)* | PDD does not describe the National and/or Sectoral policies and circumstances in the baseline scenario of the proposed project activity as per VVM version 1.1 para 84 and EB 22 annex 3 | | |
| **Corrective Action #1** *This section shall be filled by the PP. It shall address the corrective action taken in details.* | The revised PDD now incorporates the National/Sectoral policies and circumstances in the baseline scenario of the proposed project activity as per VVM version 1.1 para 84 and EB 22 annex 3. | | |
| **DOE Assessment #1** *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.* | Though the PDD has been revised appropriately, considering EB55 Para 27, the latter gives an option not to consider national and sectoral policies to demonstrate additionality. Hence, CAR is closed. | | |
| **Conclusion** *Tick the appropriate checkbox* | ☐ To be checked during the first periodic verification<br>☒ Appropriate action was taken<br>☒ Project documentation was corrected correspondingly<br>☐ Additional action should be taken<br>☐ The project complies with the requirements | | |

| Project Baseline, Additionality | CAR B4 | | |
|---|---|---|---|
| **Classification** | ☒ CAR | ☐ CL | ☐ FAR |
| **Description of finding** *Describe the finding in unambiguous style; address the context (e.g. section)* | Computation of benchmark contain the following inadequacies:<br><br>a) It has been stated, All the power generating companies listed and trading in the Bombay Stock Exchange (BSE) have been considered for computing the risk of the project type/activity" (p.14), which appears to be incorrect and misleading;<br><br>b) It has not been explained how the selection of BSE Sensex is considered more conservative than BSE 500 and how does the selection of BSE Sensex as a proxy for market return is in conformity with CAPM;<br><br>c) The basis for choosing 3 year duration and monthly return for return interval has not been explained;<br><br>d) The independent variable considered for computing beta, starting period and cut off period, and the computation of beta /web shots have not been given. | | |
| **Corrective Action #1** *This section shall be filled by the PP. It shall address the cor-* | The benchmark has been revised to the local commercial lending rate applicable to the project activity. In this context, we wish to | | |

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| *rective action taken in details.* | submit that the board took the decision to implement the project with an installed capacity of 24 MW vide their board resolution dated 15th September 2008. In the board resolution, it was decided that the project would not be economically viable and financially sustainable without CDM benefits. At the time of taking investment decision, the prevailing PLR was 13.25% to 14%. We have therefore taken average of PLR range i.e.13.63% as the benchmark for the project IRR. |
| **DOE Assessment #1**<br>*The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.* | Since the benchmark has been revised, CAR has lost its relevance. Further, the commercial lending rate is on line with the Annex 58, EB 51. CAR is closed |
| **Conclusion**<br>*Tick the appropriate checkbox* | ☐ To be checked during the first periodic verification<br>☐ Appropriate action was taken<br>☒ Project documentation was corrected correspondingly<br>☐ Additional action should be taken<br>☒ The project complies with the requirements |

| **Project Baseline, Additionality** | **CAR B5** | | |
|---|---|---|---|
| **Classification** | ☒ CAR | ☐ CL | ☐ FAR |
| **Description of finding**<br>*Describe the finding in unambiguous style; address the context (e.g. section)* | Project cost should be presented in a transparent manner. PP is requested to develop a work sheet by considering all the individual equipment components cost and link it to assumption sheet. | | |
| **Corrective Action #1**<br>*This section shall be filled by the PP. It shall address the corrective action taken in details.* | The PP has submitted an excel sheet considering all the individual equipment/components cost and linked it back to the assumptions sheet. | | |
| **DOE Assessment #1**<br>*The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.* | IRR sheet has been revised appropriately. CAR is closed. | | |
| **Conclusion**<br>*Tick the appropriate checkbox* | ☐ To be checked during the first periodic verification<br>☐ Appropriate action was taken<br>☒ Project documentation was corrected correspondingly<br>☐ Additional action should be taken<br>☒ The project complies with the requirements | | |

| **Project Baseline, Additionality** | **CAR B6** | | |
|---|---|---|---|
| **Classification** | ☒ CAR | ☐ CL | ☐ FAR |

| Project Baseline, Additionality | CAR B6 |
|---|---|
| **Description of finding**<br>*Describe the finding in unambiguous style; address the context (e.g. section)* | While APERC has recommended auxiliary consumption at 1% and CERC has recommended 0.5%, auxiliary consumption and transmission losses have been assumed at 3% in the project, which is very high and is not borne by the experience of DOE |
| **Corrective Action #1**<br>*This section shall be filled by the PP. It shall address the corrective action taken in details.* | The 3% assumed in the DPR incorporates both Auxiliary Consumption and Transmission Losses. The PP has clarified the same & provided the DOE with a technical clarification from TECSOL Engineers Pvt Ltd, a leading consultant in the electrical field which justifies the use of a figure of 3% in order to determine the auxiliary consumption and transmission losses of the project activity. |
| **DOE Assessment #1**<br>*The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.* | Technical clarification supported by the third party engineer has been submitted in respect of auxiliary consumption and line losses. However, in view of the fact that APERC has recommended only 1% auxiliary consumption and CERC has recommended 0.5% auxiliary consumption, the CAR is converted into FAR on the following lines:<br><br>"*The auxiliary consumption and transmission losses will be monitored periodically and in case the auxiliary consumption and transmission loss is less than 3%, the financial additionality of the project should be revisited*" |
| **Conclusion**<br>*Tick the appropriate checkbox* | ☐ To be checked during the first periodic verification<br>☐ Appropriate action was taken<br>☐ Project documentation was corrected correspondingly<br>☐ Additional action should be taken<br>☐ The project complies with the requirements |

| Project Baseline, Additionality | FAR B1 | | |
|---|---|---|---|
| **Classification** | ☐ CAR | ☐ CL | ☒ FAR |
| **Description of finding**<br>*Describe the finding in unambiguous style; address the context (e.g. section)* | *The auxiliary consumption transmission losses will be monitored periodically and in case the combined auxiliary consumption and transmission losses is less than 3%, the financial additionality of the project should be revisited*. | | |
| **Corrective Action #1**<br>*This section shall be filled by the PP. It shall address the corrective action taken in details.* | | | |
| **DOE Assessment #1**<br>*The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.* | | | |

| Project Baseline, Additionality | FAR B1 |
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| **Conclusion**<br>*Tick the appropriate checkbox* | ☐ To be checked during the first periodic verification<br>☐ Appropriate action was taken<br>☐ Project documentation was corrected correspondingly<br>☐ Additional action should be taken<br>☐ The project complies with the requirements |

| Project Baseline, Additionality | CAR B7 | | |
|---|---|---|---|
| **Classification** | ☐ CAR | ☐ CL | ☐ FAR |
| **Description of finding**<br>*Describe the finding in unambiguous style; address the context (e.g. section)* | CERC has recommended O&M cost of Rs.12 lakhs per MW and APERC has recommended 1.5% of the project cost, which works out to Rs.6.75 lakhs per MW. In the above background, O&M cost of Rs.12.77 lakhs appears high. Moreover, while APERC has recommended an escalation of 4% p.a. and CERC has recommended 5.72% p.a., a 10% escalation has been assumed, which is not acceptable. | | |
| **Corrective Action #1**<br>*This section shall be filled by the PP. It shall address the corrective action taken in details.* | The O & M Cost has been set at 1.66% of project costs (which is only marginally higher than the APERC norms) & is thus, conservative in nature. Further, the O & M cost escalation has been now been reduced to 5.72% p.a, in line with CERC norms. | | |
| **DOE Assessment #1**<br>*The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.* | O&M cost works out to 1.66% of the project cost which is in the range of O&M costs of a hydropower project[/RE/]. Considering the fact that the project is experiencing cost overrun, the O&M cost as percent of completed cost would work out much lesser. The escalation has been brought down to 5.72%, which is in line with the recommendations of CERC. CAR is closed | | |
| **Conclusion**<br>*Tick the appropriate checkbox* | ☐ To be checked during the first periodic verification<br>☐ Appropriate action was taken<br>☒ Project documentation was corrected correspondingly<br>☐ Additional action should be taken<br>☒ The project complies with the requirements | | |

| Project Baseline, Additionality | CAR B8 | | |
|---|---|---|---|
| **Classification** | ☒ CAR | ☐ CL | ☐ FAR |
| **Description of finding**<br>*Describe the finding in unambiguous style; address the context (e.g. section)* | In the sensitivity analysis, since 10% variation has been given (which conforms to Guidance 18 of Annex 58, EB 51), results of 5% variation may not be necessary as it does not add any value. | | |
| **Corrective Action #1**<br>*This section shall be filled by the PP. It shall address the corrective action taken in details.* | As per Guidance 18 of Annex 58, EB51 variations in the sensitivity analysis should at least cover a range of + 10% and -10%, unless this is not deemed appropriate in the context of the specific project circumstances. In this instant case, the project is already experiencing a cost overrun and the PLF assumed is much higher | | |

| Project Baseline, Additionality | CAR B8 |
|---|---|
| | than the APERC recommended PLF. Therefore, the probability of project cost reducing or PLF increasing by as much as 10% is absolutely impossible. It was against this background that we had given 5% variation. Nevertheless, since the guidance requires that the sensitivity analysis should cover a range of +/-10%, we have provided the 10% variations also. However, for all practical purposes, what is appropriate in the context of the specific project circumstances is only a 5% variation. Hence, we request you to consider only 5% variation for sensitivity analysis. |
| **DOE Assessment #1**<br>*The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.* | Guidance 18 of Annex 58, EB 51 also states, "As a general point of departure variations in the sensitivity analysis should at least cover a range of +10% and -10%, unless this is not deemed appropriate in the context of the specific project circumstances". Therefore presentation of both 10% and 5% variation is not necessary and it could be restricted to 5%. The explanation offered by the PP reveal that consideration of 5% variation is appropriate in the context of the specific project circumstances. CAR is closed |
| **Conclusion**<br>*Tick the appropriate checkbox* | ☐ To be checked during the first periodic verification<br>☐ Appropriate action was taken<br>☒ Project documentation was corrected correspondingly<br>☐ Additional action should be taken<br>☒ The project complies with the requirements |

| Project Baseline, Additionality | CAR B9 | | |
|---|---|---|---|
| **Classification** | ☒ CAR | ☐ CL | ☐ FAR |
| **Description of finding**<br>*Describe the finding in unambiguous style; address the context (e.g. section)* | For common practice analysis, projects with a capacity of more than 20 MW and located in Andhra Pradesh seems to have been chosen. Explain how the selection conforms to the conditions stipulated in step 4 of Additionality Tool. It is also observed that there are hydropower projects which have been set up without CDM benefits in Andhra Pradesh. The list given therefore does not seem to be exhaustive. | | |
| **Corrective Action #1**<br>*This section shall be filled by the PP. It shall address the corrective action taken in details.* | The common practice analysis has been revised in order to compare project activities of a scale similar to the project activity. 35 projects of similar capacity are compared with the project activity. This analysis clearly shows that these projects did not face similar barriers to the project activity. | | |
| **DOE Assessment #1**<br>*The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.* | The website address given for common practice analysis does not open. Common practice analysis does not explain the geographical region and projects selected and the conformity to step 4 of Additionality Tool, does not list the selected projects, does not explain how many of them have sought and how many of them have not sought CDM benefits, how the candidate project differs from those which have not sought CDM benefits. Moreover, | | |

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| | reasons for eliminating SSC project activities (should conform to UNFCCC regulations and not GOI definition) has not been explained. Common practice analysis section should exactly conform to step 4 of Additionality Tool. CAR is open |
| **Corrective Action #2** | The website address has now been corrected and screen shots for the same were provided to the DOE. The common practice analysis has been revised in conformity to step 4 of Additionality Tool. |
| **DOE Assessment #2** | Screen shots have been furnished. Common practice analysis has been revised and it conforms to step 4 of Additionality Tool. CAR is closed |
| **Conclusion**<br>*Tick the appropriate checkbox* | ☐ To be checked during the first periodic verification<br>☐ Appropriate action was taken<br>☒ Project documentation was corrected correspondingly<br>☐ Additional action should be taken<br>☒ The project complies with the requirements |

| **Project Baseline, Additionality** | **CAR B10** | | |
|---|---|---|---|
| **Classification** | ☒ CAR | ☐ CL | ☐ FAR |
| **Description of finding**<br>*Describe the finding in unambiguous style; address the context (e.g. section)* | PP is requested to use financial years, not 1, 2 and 3 in all the worksheets and PDD. | | |
| **Corrective Action #1**<br>*This section shall be filled by the PP. It shall address the corrective action taken in details.* | The worksheets and PDD have been corrected in order to incorporate this suggestion. | | |
| **DOE Assessment #1**<br>*The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.* | Financial years have been used. CAR is closed | | |
| **Conclusion**<br>*Tick the appropriate checkbox* | ☐ To be checked during the first periodic verification<br>☐ Appropriate action was taken<br>☒ Project documentation was corrected correspondingly<br>☐ Additional action should be taken<br>☒ The project complies with the requirements | | |

| **Project Baseline, Additionality** | **CL B1** | | |
|---|---|---|---|
| **Classification** | ☐ CAR | ☒ CL | ☐ FAR |
| **Description of finding**<br>*Describe the finding in unambiguous style; address the context (e.g. section)* | It is stated in the PDD, "The tool permits us to select either the Project IRR (the viability of the project to service debt) or the Equity IRR (the final return on the initial equity investment) to demonstrate the additionality" (p.13). Clarify whether the Additionality Tool makes such statement and if so the relevant page number | | |

| Project Baseline, Additionality | CL B1 |
|---|---|
| | /paragraph number may be given for quick reference. |
| **Corrective Action #1**<br>*This section shall be filled by the PP. It shall address the corrective action taken in details.* | The statement made in the PDD was a reference to the guidance on the calculation of Project IRR and Equity IRR provided in the Additionality Tool, Version 5.2. If you refer to points 9 and 10 on page 14 of the tool, it lists out the purpose of calculating project/equity IRRs. The PP merely inserted these statements in the PDD in order to highlight the method used to demonstrate additionality. We have made use of the project IRR in order to demonstrate the additionality of the project & the PDD has been corrected accordingly. |
| **DOE Assessment #1**<br>*The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.* | Since project IRR has been used which is appropriate financial indictor for the project activity in the context of decision making, project type. CL is closed |
| **Conclusion**<br>*Tick the appropriate checkbox* | ☐ To be checked during the first periodic verification<br>☐ Appropriate action was taken<br>☒ Project documentation was corrected correspondingly<br>☐ Additional action should be taken<br>☒ The project complies with the requirements |

| Project Baseline, Additionality | CL B2 | | |
|---|---|---|---|
| **Classification** | ☐ CAR | ☒ CL | ☐ FAR |
| **Description of finding**<br>*Describe the finding in unambiguous style; address the context (e.g. section)* | The project cost is 1.5 times the cost recommended by CERC as late as 2009 and more than 1.7 times the project cost recommended by APERC. At this cost any project would be additional. The cost appears to be very high and unacceptable | | |
| **Corrective Action #1**<br>*This section shall be filled by the PP. It shall address the corrective action taken in details.* | The DOE has now been provided with a technical note by DADO HEGDE Technocrats Pvt Ltd, which justifies the project cost estimates used in the DPR. Thus, the cost of the project is within acceptable norms. | | |
| **DOE Assessment #1**<br>*The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.* | As high cost has been substantiated by a third party engineering consultant and the project is reported to be experiencing cost overruns, the cost is accepted. However, in the financial indicator calculation only the original cost (and not the revised cost) has been considered. CL is closed | | |
| **Conclusion**<br>*Tick the appropriate checkbox* | ☐ To be checked during the first periodic verification<br>☐ Appropriate action was taken<br>☒ Project documentation was corrected correspondingly<br>☒ Additional action should be taken | | |

| Project Baseline, Additionality | CL B2 |
|---|---|
| | ☐ The project complies with the requirements |

| Project Baseline, Additionality | CL B3 | | |
|---|---|---|---|
| **Classification** | ☐ CAR | ☒ CL | ☐ FAR |
| **Description of finding** *Describe the finding in unambiguous style; address the context (e.g. section)* | Interest seems to be overstated as the MNES subsidy has not been deducted from the outstanding loan amount in the first year. Consequently, loan amount equivalent to MNES subsidy is outstanding at the end of the term. | | |
| **Corrective Action #1** *This section shall be filled by the PP. It shall address the corrective action taken in details.* | The MNES subsidy has now been deducted in the 1st year and consequently, the loan amount reduces to that extent. This can be viewed in the revised financials submitted to the DOE. | | |
| **DOE Assessment #1** *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.* | As per the guidelines, 50% of the subsidy would be disbursed during implementation period and the balance 50% after the commencement of operation. Hence, correct accounting principle would require deducting 50% of the subsidy from the loan amount as well as the project cost and reckoning the balance 50% as repayment at the end of the first year of operation and in the first year cash inflow. CL is open | | |
| **Corrective Action #2** | The financial analysis has been revised in order to incorporate the distribution of the MNES subsidy obtained for the project activity. | | |
| **DOE Assessment #2** | Interest calculation has been corrected. CL is closed | | |
| **Conclusion** *Tick the appropriate checkbox* | ☐ To be checked during the first periodic verification<br>☐ Appropriate action was taken<br>☒ Project documentation was corrected correspondingly<br>☐ Additional action should be taken<br>☒ The project complies with the requirements | | |

| Project Baseline, Additionality | CL B4 | | |
|---|---|---|---|
| **Classification** | ☐ CAR | ☒ CL | ☐ FAR |
| **Description of finding** *Describe the finding in unambiguous style; address the context (e.g. section)* | It is observed that a sum of Rs.162.89 mn. has been provided as refurbishment cost in 2021-22; it is also gathered from the algorithm given that a sum of Rs.100 mn. escalated at 5% p.a for 10 years formed the basis for this cost. Clarify whether such cost has been recommended by machinery supplier/ technical consultant and if so furnish documentary evidence thereof with justification for the cost. | | |
| **Corrective Action #1** *This section shall be filled by the PP. It shall address the corrective action taken in details.* | The PP has provided the DOE with a letter from the equipment supplier/s stating that a refurbishment cost of Rs 100 mn, escalated at 5% p.a would be incurred during the 11th year of the operation of the project activity. This was the basis for the assumption utilized in the financial analysis of the project activity. | | |

| Project Baseline, Additionality | CL B4 |
|---|---|
| **DOE Assessment #1**<br>*The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.* | Considering the fact that the DPR provides for such investment and the machinery supplier has recommended the same, the investment is accepted. CL is closed |
| **Conclusion**<br>*Tick the appropriate checkbox* | ☐ To be checked during the first periodic verification<br>☐ Appropriate action was taken<br>☒ Project documentation was corrected correspondingly<br>☐ Additional action should be taken<br>☒ The project complies with the requirements |

| Project Baseline, Additionality | CL B5 | | |
|---|---|---|---|
| **Classification** | ☐ CAR | ☒ CL | ☐ FAR |
| **Description of finding**<br>*Describe the finding in unambiguous style; address the context (e.g. section)* | In the IRR calculation, loan repayment falls short of the total loan amount. Cash flow does not include salvage value and MNES subsidy. Consequently, IRR seems to be understated. | | |
| **Corrective Action #1**<br>*This section shall be filled by the PP. It shall address the corrective action taken in details.* | The IRR calculations have now been corrected & submitted to the DOE. | | |
| **DOE Assessment #1**<br>*The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.* | Since the project developer has modified the financial indicator to project IRR, the first part of the CL has lost its relevance. The cash flow now submitted reckons salvage value and MNRE subsidy.<br><br>In this context, it is observed that the investment has been phased over two years. Explain the basis for this phasing.<br><br>CL is open | | |
| **Corrective Action #2** | Page 58 of the DPR provided to the DOE quotes: "*The interest during construction has been estimated by adopting a rate of 12.15% for term loan from financial institutions as per the anticipated expenditure spread over the 24 months completion period and is worked out as Rs 1641.43 lakhs*". Thus, the phasing of investment was undertaken over two years and we have committed 50% of the project cost in the first year and the remaining 50% in the second year. This is due to the fact that most hydro projects have a construction period of around 2 yrs (or more). Further, while sanctioning the term loan IREDA has considered a construction period of 27 months against our original assumption of 24 months. This implies that 100% of the investment would be completed in approximately 2 years time. | | |
| **DOE Assessment #2** | Explanation on phasing of investment is accepted as DPR (which is accepted by IREDA) provides for 2 years implementation period. | | |

| Project Baseline, Additionality | CL B5 |
|---|---|
| | CL is closed |
| **Conclusion**<br>*Tick the appropriate checkbox* | ☐ To be checked during the first periodic verification<br>☐ Appropriate action was taken<br>☒ Project documentation was corrected correspondingly<br>☐ Additional action should be taken<br>☒ The project complies with the requirements |

| Project Baseline, Additionality | CL B6 | | |
|---|---|---|---|
| **Classification** | ☐ CAR | ☒ CL | ☐ FAR |
| **Description of finding**<br>*Describe the finding in unambiguous style; address the context (e.g. section)* | Equity IRR has been chosen as the financial indicator to demonstrate additionality. Considering the fact that the project is funded by a debt equity mix, clarify how the equity IRR is considered to be the "…most suitable for the project type and decision-making context". | | |
| **Corrective Action #1**<br>*This section shall be filled by the PP. It shall address the corrective action taken in details.* | The PP has now utilized project IRR (considering the 70-30 debt:equity mix) and compared it to the relevant benchmark (Local Commerical lending rate of 14.00% as per RBI norms). | | |
| **DOE Assessment #1**<br>*The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.* | Financial indicator has been changed to project IRR and hence the CL is closed | | |
| **Conclusion**<br>*Tick the appropriate checkbox* | ☐ To be checked during the first periodic verification<br>☐ Appropriate action was taken<br>☒ Project documentation was corrected correspondingly<br>☐ Additional action should be taken<br>☒ The project complies with the requirements | | |

| Project Baseline, Additionality | CL B7 | | |
|---|---|---|---|
| **Classification** | ☐ CAR | ☒ CL | ☐ FAR |
| **Description of finding**<br>*Describe the finding in unambiguous style; address the context (e.g. section)* | It has been stated, "The revenues include the sale of electricity from the power plant using the levelized tariff, assuming escalation as nil". While vide p.17 of PDD, it has been stated, "The PPA signed with Tata Power Ltd offers a fixed price for 10years…." Clarify the reasons for the discrepancy in the two statements. If levelized tariff has indeed been considered in projections, explain the reasons for taking levelized tariff as well as the discount factor used for levelization. Also clarify whether Additionality Tool, VVM or the methodology ACM 0002 or PPA requires the use of levelized tariff in IRR computation. | | |

| | |
|---|---|
| **Corrective Action #1**<br>*This section shall be filled by the PP. It shall address the corrective action taken in details.* | The use of the term' levelized tariff' was an error in the PDD. As per the PPA signed with Tata Power (a copy of which has now been provided to the DOE), the tariff is INR 3.50/unit. Thus, this has now been corrected in the revised PDD. |
| **DOE Assessment #1**<br>*The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.* | PDD has been corrected and reference to levelized tariff has been removed. CL is closed |
| **Conclusion**<br>*Tick the appropriate checkbox* | ☐ To be checked during the first periodic verification<br>☐ Appropriate action was taken<br>☒ Project documentation was corrected correspondingly<br>☐ Additional action should be taken<br>☒ The project complies with the requirements |

| **Project Baseline, Additionality** | **CL B8** | | |
|---|---|---|---|
| **Classification** | ☐ CAR | ☒ CL | ☐ FAR |
| **Description of finding**<br>*Describe the finding in unambiguous style; address the context (e.g. section)* | Clarify the reasons for keeping the tariff constant, while the O&M cost is subjected to escalation at 10%. | | |
| **Corrective Action #1**<br>*This section shall be filled by the PP. It shall address the corrective action taken in details.* | We wish to submit that the tariff of Rs 3.50/unit is valid until Dec 2012 and is subject to revision by mutual consent for the later period. Though it is true that the PPA contains a sentence to the effect that all efforts would be made by TPTCL to secure the highest possible rate, a careful reading of the entire sentence would reveal that it is suffixed with "based on market mechanism". Considering the fact that the tariff fixed by APERC for hydel projects is much lower and that the generating capacity of Andhra Pradesh is envisaged to go multi forth in the times to come, the tariff is unlikely to move northwards. It is against this background that we have considered the tariff as fixed for the operating life of the project which in our opinion is quite conservative as compared to the tariff fixed by the APERC. However, in order to maintain the completeness of the financial analysis, we have still undertaken a 5% variation in the tariff rate post 2012 for the sensitivity analysis within the revised PDD. This is highly conservative. | | |
| **DOE Assessment #1**<br>*The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.* | Since PPA provides for fixed tariff, constant tariff assumption is considered appropriate. CL is closed | | |
| **Conclusion**<br>*Tick the appropriate checkbox* | ☐ To be checked during the first periodic verification<br>☐ Appropriate action was taken<br>☒ Project documentation was corrected correspondingly<br>☐ Additional action should be taken | | |

| Project Baseline, Additionality | CL B8 |
|---|---|
| | ☒ The project complies with the requirements |

| Project Baseline, Additionality | CL B9 | | |
|---|---|---|---|
| **Classification** | ☐ CAR | ☒ CL | ☐ FAR |
| **Description of finding** *Describe the finding in unambiguous style; address the context (e.g. section)* | Book depreciation rate has been taken at 2.57% and Companies Act has been cited as the basis. Clarify which section or Schedule of the Companies Act recommends this depreciation rate | | |
| **Corrective Action #1** *This section shall be filled by the PP. It shall address the corrective action taken in details.* | The CERC regulations(available on http://cercind.gov.in/131205/appendix_2.pdf ) mentions the depreciation rate for hydro projects, which is 2.57%. Thus, this rate has been taken in the excel sheet submitted to the DOE. | | |
| **DOE Assessment #1** *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.* | CERC is not Companies Act – both are different. Clarify whether the company adopts CERC recommended depreciation rates in its books. If so an evidence / a declaration to the effect may be furnished. CL is open | | |
| **Corrective Action #2** | The depreciation rate was estimated as 2.57% in the preparation of DPR, as per the CERC norms (and not Companies Act). A copy of the extract referred to has now been provided to the DOE. Further, the PP has provided an undertaking stating that it uses this rate in order to estimate depreciation for its power projects. | | |
| **DOE Assessment #2** | Error has been corrected and a declaration to the effect that CERC recommended depreciation rate would be used in the books has been submitted. Since the project is subject to MAT and the depreciation rate affects the cash flow and the use of depreciation rate is within the control of the PP, the CL has been converted into FAR on the following lines:<br><br>"*The book depreciation rate used will be monitored during the first verification and in case it is observed that the company has opted for Schedule XIV depreciation instead of CERC recommended depreciation, financial additionality will be revisited"*.<br><br>CL is closed | | |
| **Conclusion** *Tick the appropriate checkbox* | ☐ To be checked during the first periodic verification<br>☐ Appropriate action was taken<br>☒ Project documentation was corrected correspondingly<br>☐ Additional action should be taken<br>☒ The project complies with the requirements | | |

| Project Baseline, Additionality | CL B10 | | |
|---|---|---|---|
| **Classification** | ☐ CAR | ☒ CL | ☐ FAR |
| **Description of finding** *Describe the finding in unambiguous style; address the context (e.g. section)* | While the PDD provides for accelerated depreciation at 80%, in the worksheet IT depreciation rate has been taken only at 15%. Clarify the reasons for this discrepancy. | | |
| **Corrective Action #1** *This section shall be filled by the PP. It shall address the corrective action taken in details.* | This was a mistake within the PDD and has been corrected now. | | |
| **DOE Assessment #1** *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.* | Depreciation rate adopted in the worksheet is in conformity with IT Rules and the mistake in PDD has been corrected. CL is closed | | |
| **Conclusion** *Tick the appropriate checkbox* | ☐ To be checked during the first periodic verification<br>☐ Appropriate action was taken<br>☒ Project documentation was corrected correspondingly<br>☐ Additional action should be taken<br>☒ The project complies with the requirements | | |

| Project Baseline, Additionality | CL B11 | | |
|---|---|---|---|
| **Classification** | ☐ CAR | ☒ CL | ☐ FAR |
| **Description of finding** *Describe the finding in unambiguous style; address the context (e.g. section)* | It is stated, “The equity IRR (11.97%) is lower than the expected return on equity for similar projects, i.e., the benchmark (15.77%) calculated above” (p.16). Clarify which other projects have been analysed and the relevant details may be furnished. | | |
| **Corrective Action #1** *This section shall be filled by the PP. It shall address the corrective action taken in details.* | The revised financials have been submitted to the DOE. The project IRR has been used as the benchmark (in line with the UN Guidelines EB 51 Annex 58) & has been compared with the relevant benchmark. All relevant evidences have now been provided to the DOE. | | |
| **DOE Assessment #1** *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.* | Since the financial indicator has been changed, which is in line with annex 58, EB51. CL is closed | | |
| **Conclusion** *Tick the appropriate checkbox* | ☐ To be checked during the first periodic verification<br>☐ Appropriate action was taken<br>☒ Project documentation was corrected correspondingly<br>☐ Additional action should be taken<br>☐ The project complies with the requirements | | |

| Project Baseline, Additionality | CL B12 | | |
|---|---|---|---|
| **Classification** | ☐ CAR | ☒ CL | ☐ FAR |
| **Description of finding** *Describe the finding in unambiguous style; address the context (e.g. section)* | PDD states, "This is also clear from the fact that the loan application made to IREDA clearly incorporates the CDM revenue stream, in order to improve the expected financial returns from the project activity" (p.16). In the background of above statement, clarify whether the loan has been sanctioned by IREDA as yet or not. | | |
| **Corrective Action #1** *This section shall be filled by the PP. It shall address the corrective action taken in details.* | The term Loan has already been sanctioned by IREDA and a copy of the sanction letter was furnished to the DOE. | | |
| **DOE Assessment #1** *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.* | Loan application submitted to IREDA considers CDM benefits. CL is closed. | | |
| **Conclusion** *Tick the appropriate checkbox* | ☐ To be checked during the first periodic verification<br>☐ Appropriate action was taken<br>☒ Project documentation was corrected correspondingly<br>☐ Additional action should be taken<br>☒ The project complies with the requirements | | |

| Project Baseline, Additionality | CL B13 | | |
|---|---|---|---|
| **Classification** | ☐ CAR | ☒ CL | ☐ FAR |
| **Description of finding** *Describe the finding in unambiguous style; address the context (e.g. section)* | Interest during construction has been computed based on a phasing. In this context, clarify whether DPR provides for IDC or not. If it does, the reasons for giving a computation based on an imaginary implementation schedule (which does not seem to conform to any system) can be explained. Also clarify whether the IDC considered is in conformity with the IDC taken into account in the loan appraisal memorandum by IREDA. | | |
| **Corrective Action #1** *This section shall be filled by the PP. It shall address the corrective action taken in details.* | Yes, the DPR provides for IDC computation. | | |
| **DOE Assessment #1** *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.* | The response is incomplete. CL is open | | |
| **Corrective Action #2** | Page 57 of the DPR provided to the DOE quotes: "*The interest during construction has been estimated by adopting a rate of 12.15% for term loan from financial institutions as per the anticipated expenditure spread over the 24 months completion* | | |

| Project Baseline, Additionality | CL B13 |
|---|---|
| | *period and is worked out as Rs 1641.43 lakhs*". The same method has been used in the financial analysis excel sheet to undertake this computation, as per CDM rules. The implementation schedule is thus not an imaginary one but a well planned schedule. A project of this magnitude has to be planned well ahead for implementation. The implementation schedule was provided to the DOE as an addendum to the DPR (figure 7.1, page 50(a) of DPR) and the IDC was calculated on this basis. However, the financial institutions have their own norms for computing IDC. Thus, the IDC computed by IREDA differs from the projections (refer loan sanction letter dated 4th January 2010). |
| **DOE Assessment #2** | DPR provides for IDC and the explanation is accepted. CL is closed |
| **Conclusion**<br>*Tick the appropriate checkbox* | ☐ To be checked during the first periodic verification<br>☐ Appropriate action was taken<br>☒ Project documentation was corrected correspondingly<br>☐ Additional action should be taken<br>☒ The project complies with the requirements |

| Project Baseline, Additionality | CL B14 | | |
|---|---|---|---|
| **Classification** | ☐ CAR | ☒ CL | ☐ FAR |
| **Description of finding**<br>*Describe the finding in unambiguous style; address the context (e.g. section)* | In this context, it may also be clarified, whether the equity infusion assumed in the IDC computation conforms to the conditions stipulated by IREDA in its loan sanction letter | | |
| **Corrective Action #1**<br>*This section shall be filled by the PP. It shall address the corrective action taken in details.* | The equity infusion assumed in the IDC computation conforms to the conditions stipulated by IREDA in its loan sanction letter | | |
| **DOE Assessment #1**<br>*The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.* | Response does not answer the CL. The CL seeks whether the phasing of investment and financing pattern envisaged thereto conforms to IREDA loan sanction letter. CL is open | | |
| **Corrective Action #2** | The investment made in the project activity was phased over 24 months (or 8 quarters) as per the implementation schedule in the DRP provided to IREDA. The same phasing of investment has been considered in the IREDA loan sanction letter. Similarly, the financing pattern envisaged in the DPR is the same as in the IREDA loan sanction letter i.e. 70-30 debt equity ratio. The debt-equity ratio remains the same during all disbursements/implementation.. | | |
| **DOE Assessment #2** | IREDA has provided Rs.135.3 mn as IDC in contrast to Rs.164.1 mn. provided in the DPR. However, at the time of decision making the IDC available to PP was Rs.164.1 mn. Moreover, it is observed that the project is facing a cost overrun and the completed cost is | | |

| Project Baseline, Additionality | CL B14 |
|---|---|
| | estimated at Rs.2199.6 mn. in contrast to Rs.1843.5 mn. assumed in the financial indicator calculation. In the above background, the IDC is accepted. CL is closed |
| **Conclusion**<br>*Tick the appropriate checkbox* | ☐ To be checked during the first periodic verification<br>☐ Appropriate action was taken<br>☒ Project documentation was corrected correspondingly<br>☐ Additional action should be taken<br>☒ The project complies with the requirements |

| Project Baseline, Additionality | CL B15 | | |
|---|---|---|---|
| **Classification** | ☐ CAR | ☒ CL | ☐ FAR |
| **Description of finding**<br>*Describe the finding in unambiguous style; address the context (e.g. section)* | Working capital has been provided at 2 months O&M cost. Normally, O&M cost is payable at the end of the month. In other words, the company enjoys one month creditor. In the above background the reasons for providing 2 months stock of O&M cost as working capital may be explained. Moreover, when the project activity is cash surplus, explain the reasons for borrowing. | | |
| **Corrective Action #1**<br>*This section shall be filled by the PP. It shall address the corrective action taken in details.* | The sales proceeds will be received 10 days after monthly invoices are raised. The O & M expenses are due at the end of the month. So, a time lag of 10 to 15 days needs to be considered for working capital. Further, there is no cash surplus in the project activity. The financials have been revised accordingly. | | |
| **DOE Assessment #1**<br>*The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.* | PPA provides for the release of payment after 10 days and some operating cost has to be paid in advance. Hence considering of 10 days receivables and 15 days O&M cost is accepted. CL is closed | | |
| **Conclusion**<br>*Tick the appropriate checkbox* | ☐ To be checked during the first periodic verification<br>☐ Appropriate action was taken<br>☒ Project documentation was corrected correspondingly<br>☐ Additional action should be taken<br>☒ The project complies with the requirements | | |

| Project Baseline, Additionality | CL B16 | | |
|---|---|---|---|
| **Classification** | ☐ CAR | ☒ CL | ☐ FAR |
| **Description of finding**<br>*Describe the finding in unambiguous style; address the context (e.g. section)* | Loan interest has been computed as if the loan repayment is due half yearly. Clarify whether it is in conformity with loan sanction letter. | | |

| Project Baseline, Additionality | CL B16 |
|---|---|
| **Corrective Action #1**<br>*This section shall be filled by the PP. It shall address the corrective action taken in details.* | The Loan repayment is in quarterly installments (as per the IREDA sanction letter). However, while calculating interest, average balance method has been adopted which is in conformity with DPR submitted to the financial institution (IREDA). Thus, the financials submitted to IREDA were those used for CDM purposes. |
| **DOE Assessment #1**<br>*The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.* | Loan interest computation has been corrected. Though it is stated that the interest is computed on average balance, it seems to have been computed on opening balance, which is correct. The response and calculation are not in agreement. However, since the calculations are correct, CL is closed |
| **Conclusion**<br>*Tick the appropriate checkbox* | ☐ To be checked during the first periodic verification<br>☐ Appropriate action was taken<br>☒ Project documentation was corrected correspondingly<br>☐ Additional action should be taken<br>☒ The project complies with the requirements |

| Project Baseline, Additionality | CL B17 | | |
|---|---|---|---|
| **Classification** | ☐ CAR | ☒ CL | ☐ FAR |
| **Description of finding**<br>*Describe the finding in unambiguous style; address the context (e.g. section)* | It may be clarified how the CDM revenues were considered essential to overcome the investment barrier to this project activity, in particular that the benchmark represents a rate below which the investment could not be made. | | |
| **Corrective Action #1**<br>*This section shall be filled by the PP. It shall address the corrective action taken in details.* | The project is not viable without CDM revenues. The same has been considered in the DPR furnished to IREDA, and the sanction of the Term Loan by IREDA is based on the Financial projections with CDM revenues included. Thus, it is clear that CDM revenues are essential to overcome the investment barrier. | | |
| **DOE Assessment #1**<br>*The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.* | The response does not answer the CL. CL is open | | |
| **Corrective Action #2** | In this context, we wish to submit that the board took the decision to implement the project with an installed capacity of 24 MW vide their board resolution dated 15th September 2008. In the board resolution, it was decided that the project would not be economically viable and financially sustainable without CDM benefits. At the time of taking investment decision, the prevailing PLR was 13.25% to 14% and considered PLR of 13.63% as average. Thus, it is clear that the project IRR only crosses the benchmark with the inclusion of CDM revenues. | | |
| **DOE Assessment #2** | Since the financial indicator breaches the benchmark with CDM | | |

| Project Baseline, Additionality | CL B17 |
|---|---|
| | benefits, it is reasonable to assume that the investment might not have taken place at a rate below the benchmark return. CL is closed |
| **Conclusion**<br>*Tick the appropriate checkbox* | ☐ To be checked during the first periodic verification<br>☐ Appropriate action was taken<br>☒ Project documentation was corrected correspondingly<br>☐ Additional action should be taken<br>☒ The project complies with the requirements |

| Calculation of GHG emission reductions | CAR B11 | | |
|---|---|---|---|
| **Classification** | ☐ CAR | ☒ CL | ☐ FAR |
| **Description of finding**<br>*Describe the finding in unambiguous style; address the context (e.g. section)* | PP is requested to provide a transparent calculation procedure in section B.6.1. to calculate (ex-ante) the area of reservoir measured in the surface water, after implementation of the project activity, when the reservoir is full. | | |
| **Corrective Action #1**<br>*This section shall be filled by the PP. It shall address the corrective action taken in details.* | The PP has provided the DOE with the requested details. | | |
| **DOE Assessment #1**<br>*The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.* | As per the detailed project report, the area of the reservoir measured in the surface of the water, after the implementation of the project activity, when the reservoir was full. The DPR has been checked by the assessment team and found correct. | | |
| **Conclusion**<br>*Tick the appropriate checkbox* | ☐ To be checked during the first periodic verification<br>☒ Appropriate action was taken<br>☒ Project documentation was corrected correspondingly<br>☐ Additional action should be taken<br>☒ The project complies with the requirements | | |

| Calculation of GHG emission reductions | CAR B12 | | |
|---|---|---|---|
| **Classification** | ☒ CAR | ☐ CL | ☐ FAR |
| **Description of finding**<br>*Describe the finding in unambiguous style; address the context (e.g. section)* | The assumption (1.5%) of transmission losses should be explained in section B.6.1 with all the assumed parameters based on the Transformer-APTRANSO Grid-TATA Power. Further, the same should be substantiated with the calculation procedure. | | |

| Calculation of GHG emission reductions | CAR B12 |
|---|---|
| **Corrective Action #1**<br>*This section shall be filled by the PP. It shall address the corrective action taken in details.* | The 3% assumed in the DPR incorporates both Auxiliary Consumption and Transmission Losses (at 1.5% each). The PP has clarified the same & provided the DOE with a technical clarification from TECSOL Engineers Pvt Ltd, a leading consultant in the electrical field which justifies the use of a figure of 3% in order to determine the auxiliary consumption and transmission losses of the project activity. |
| **DOE Assessment #1**<br>*The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.* | As per the DPR transmission loss from the project activity have been assumed as 1.5% of total generation and the the auxilary consumption of the Power plant has been considered as 1.5% of the gross generation. Same has been considered for the Ex-ante calculation of emission reductions in section B.6.3 of the PDD.The technical clarification from TECSOL Engineers Pvt Ltd has been reviewed by the assessment team and found correct.<br><br>Hence the CAR is closed. |
| **Conclusion**<br>*Tick the appropriate checkbox* | ☐ To be checked during the first periodic verification<br>☒ Appropriate action was taken<br>☒ Project documentation was corrected correspondingly<br>☐ Additional action should be taken<br>☒ The project complies with the requirements |

| Calculation of GHG emission reductions | CAR B13 | | |
|---|---|---|---|
| **Classification** | ☒ CAR | ☐ CL | ☐ FAR |
| **Description of finding**<br>*Describe the finding in unambiguous style; address the context (e.g. section)* | Monitoring methodology mentioned in section B.7.1 is not in line with the approved methodology i.e. ACM0002 Version 12.1.0. Corrections required for the same. | | |
| **Corrective Action #1**<br>*This section shall be filled by the PP. It shall address the corrective action taken in details.* | The PDD has been revised accordingly. | | |
| **DOE Assessment #1**<br>*The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.* | Monitoring methodology mentioned in section B.7.1 of the PDD has been revised as per the approved methodology. $TEG_y$, $Cap_{PJ}$, $A_{PJ}$ are excluded in revised PDD.Hence, CAR is closed. | | |
| **Conclusion**<br>*Tick the appropriate checkbox* | ☐ To be checked during the first periodic verification<br>☒ Appropriate action was taken<br>☒ Project documentation was corrected correspondingly<br>☐ Additional action should be taken<br>☒ The project complies with the requirements | | |

| Calculation of GHG emission reductions | CAR B14 | | |
|---|---|---|---|
| **Classification** | ☒ CAR | ☐ CL | ☐ FAR |
| **Description of finding** *Describe the finding in unambiguous style; address the context (e.g. section)* | As the DG set would be available at site (Refer DPR) as a standby, referring to para 79 of the VVM version 01.2, PP is requested to monitor the project emission due to Diesel combustion. | | |
| **Corrective Action #1** *This section shall be filled by the PP. It shall address the corrective action taken in details.* | The PDD has been revised accordingly in order to include monitoring of diesel consumption, its NCV and emission factor as per the methodology requirements and para 79 of the VVM version 01.2. | | |
| **DOE Assessment #1** *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.* | PDD has been revised appropriately. NCV of Diesel fuel consumption of Diesel, its quantity and emission factor are being monitored and PDD has been corrected in section B7.1. CAR is closed. | | |
| **Conclusion** *Tick the appropriate checkbox* | ☐ To be checked during the first periodic verification<br>☒ Appropriate action was taken<br>☒ Project documentation was corrected correspondingly<br>☐ Additional action should be taken<br>☒ The project complies with the requirements | | |

| Calculation of GHG emission reductions | CAR B15 | | |
|---|---|---|---|
| **Classification** | ☒ CAR | ☐ CL | ☐ FAR |
| **Description of finding** *Describe the finding in unambiguous style; address the context (e.g. section)* | Referring to FAR B1, PP is requested to monitor the Auxiliary Consumption. Section B.7.1 needs correction. | | |
| **Corrective Action #1** *This section shall be filled by the PP. It shall address the corrective action taken in details.* | The PP has corrected section B.7.1 of the PDD in order to include monitoring of auxiliary consumption (EGaux) due to internal loads as per FAR B1. | | |
| **DOE Assessment #1** *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.* | PDD has been revised appropriately by inclusion of monitoring parameters i.e. auxiliary consumption CAR is closed | | |
| **Conclusion** *Tick the appropriate checkbox* | ☐ To be checked during the first periodic verification<br>☒ Appropriate action was taken<br>☒ Project documentation was corrected correspondingly<br>☐ Additional action should be taken<br>☒ The project complies with the requirements | | |

| Crediting Period | CAR C1 | | |
|---|---|---|---|
| **Classification** | ☒ CAR | ☐ CL | ☐ FAR |
| **Description of finding** *Describe the finding in unambiguous style; address the context (e.g. section)* | PP is requested to shift the start date of the crediting period considering the progress of the validation. Appropriate corrections are sought. | | |
| **Corrective Action #1** *This section shall be filled by the PP. It shall address the corrective action taken in details.* | Start date of the crediting period has been revised in PDD version 2 | | |
| **DOE Assessment #1** *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.* | The start date of the crediting period has been shifted to 01/10/2011which is found to be realistic. CAR is closed. | | |
| **Conclusion** *Tick the appropriate checkbox* | ☐ To be checked during the first periodic verification<br>☒ Appropriate action was taken<br>☒ Project documentation was corrected correspondingly<br>☐ Additional action should be taken<br>☒ The project complies with the requirements | | |

# 5 VALIDATION ASSESSMENT SUMMARY

## 5.1 General Description of the Project Activity

### 5.1.1 Participation

**LOA**

The host country approval was obtained from Govt of India Ministry of environmental and forest dated 18/08/2010 which is the authorised DNA by UNFCCC for CDM projects. Ministry of Environment and Forests, Govt. of India has stipulated the social well being, economic well being, environmental well being and technological well being as the four indicators for sustainable development in the interim approval guidelines for host country approval eligibility criteria for Clean Development Mechanism (CDM) projects. PDD described all the sustainable development indicators correctly and appropriately which is sufficient enough to prove that project will lead to sustainable development. The Host Country approval also indicates that project will lead to sustainable development. The project title is in line with the HCA which is entitled as "24 MW Dummagudem Hydel project by SLS Power Corporation Limited". The name of the project participant as mentioned in the PDD is in line with host Country approval obtained for the project activity.

Nevertheless, CAR A1 had to be raised in the course of the validation and was successfully closed.

**Project Participants**

M/S SLS Power Corporation Limited is the project participant and it has obtained the HCA/HCA/ from MoEF (Govt of India) for the proposed project activity. The project participant name is consistent internally within the PDD and is in line with the HCA. No Annex I Country is envisaged at this stage of validation.
Nevertheless, CAR A1 had to be raised in the course of the validation and was successfully closed.

### 5.1.2 Contribution to Sustainable Development

The Host country government approved that the project will contribute to the sustainable development in India. The details were verified from the HCA and found to be correct.

The Indian DNA approval indicates that project will lead to sustainable development.

This type of project activity is in line with sustainable development policies of the country and national regulation / policy on Environmental Protection, Electricity and Non Conventional Energy.

Nevertheless, CAR A1 had to be raised in the course of the validation and was successfully closed

### 5.1.3 PDD editorial Aspects

The project participant does not follow the latest template for completing CDM PDD form version 3 which is the latest during the global stake holder consultation process. Hence, CAR A2 has been raised. The Project also used CDM –PDD filling guideline version 07, for completing all the section of the PDD which is the latest at the time of global stake holder consultation process. However, PDD does not address the respective requirements of the CDM filling guidelines, hence resulted in Corrective action request.
Thus, CAR A2 and CAR A3 were raised in the course of the validation and were successfully closed.

### 5.1.4 Technology to be employed

The project activity involves installation of six Horizontal Pit Type Full Kaplan turbine & generation capacity of each the generator is 4 MW to generate 24 MW of power utilizing a rated head of 4.8 m and design discharge of 601.02 $m^3$.

It is proposed to generate the power at 11 kV and will be stepped up to 132 kV at the Powerhouse switchyard to evacuate the 24MW of power generated and power will be transmitted through a 132kV double circuit line is proposed with PANTHER ACSR conductor strung on 132 KV DC tower. The outgoing line will be provided with breakers and required line protection system will be terminated at the proposed 132/11 kV Bhadrachalam substation 20km from site. Suitable metering arrangement will be proposed at the switchyard as per the stipulation for metering the energy evacuated to Andhra Pradesh grid.

The gross energy estimated based on the 12 year gauged data is worked out to103400 MWh. Considering the auxilary consumption, transmission loss up to substation and grid outage account for 3%. The net saleable works out 100300 MWhand the same is considred for finanical calculation.

The synchronous generator shall include Horizontal Shaft Alternating Current, synchronous generator of capacity 4000 kW, 0.85 PF, 11 kV, 50 Hz at site condition of 40 Deg.C ambient, brushless exciter, automatic voltage regulators, neutral grounding cubicle, lightning and surge protection panel, protection relay system cooling water system, instrumentation control and safety devices and other

accessories, spares and special tools that will be required for satisfactory and efficient operation of the Station.

The generator is to be coupled to the turbine through speed increaser matched in respect of speed, runaway speed, moment of inertia, overload capacities, coupling and other relevant requirements. The generator first critical speed should be greater than 125% of the runaway speed.

The DG set will be back up to be used to start up the generators in case of station shut down coupled with failure of the grid supply from the 132/11 kV line. The rating of D.G. will be 250 KVA.

The project activity is expected to export approximately 100,300 MWh of electricity per year. This power from GHG free source will displace power from state grid which is primarily fossil fuel based and hence will effect reduced emissions in power generation from southern grid connected power stations. The estimated amount of emission reductions over the chosen 10-year “fixed crediting period” for the project activity is 892,670 $tCO_{2e}$.

Furthermore, Hydropower is a clean, renewable source of energy and does not contribute to air or water pollution or the emissions of greenhouse gases. The water after powering the turbines will be discharged back into the Godavari River through a tailrace canal, located within the river course close to the left bank open channel. The project activity will displace the fossil fuel fired power generation from the grid and hence contribute to a reduction in greenhouse gases.

### 5.1.5 Small Scale Projects

Not applicable for this project activity as it is a large scale project.

## 5.2 Project Baseline, Additionality and Monitoring Plan

### 5.2.1 Application of the Methodology

The project applies approved baseline and monitoring methodology “Consolidated baseline methodology for grid-connected electricity generation from renewable sources”; ACM 0002, Version 12.1.0 and adheres to Sectoral Scope1. The baseline methodology is applicable since the proposed project activity has been implemented which is renewable energy generation technology.

All the applicability criteria for the project activity is defined in section B.2 of the PDD which is assessed to be correct by the assessment team during the validation site visit. The project is in line with all the other stipulated requirement of the methodology.

The project correctly applies reference of tool, which the approved consolidated methodology ACM002 drawn upon:

- Version 2 – Tool to calculate the emission factor for an electricity system, EB 50
- Version 2 - Tool to calculate project or leakage $CO_2$ emissions from fossil fuel combustion, EB 41
- Version 5.2 – Tool for the demonstration and assessment of additionality, EB 39, Annex 10

The project activity satisfies the applicability criteria of ACM0002:

The project activity involves the installation of hydro power plant. During the site visit and subsequent document review, assessment team confirms that the hydro electric power plant is a greenfield run-of-river hydro power plant connected to the Southern Regional Grid and will produce power for sale to the grid, displacing fossil fuel based power generation. Hence, the applicabiliy criterion 1 and 2 are met.

As the project activity is a greenfield project, it does not involve any additions, retrofits or replacements. Hence, applicability criterion 3 is met. As the project activity is a run of river project with a tailrace pond (not a new reservoir) but the power density is 192 $W/m^2$ which is greater than $4W/m^2$, ,applicability criterion 4 is met.

The project activity supplies the generated electricity to Southern Regional grid of India, and whose boundaries are clearly identified by the Central Electricity Authority (CEA), Government of India. The information on characteristics of the grid is also available in the public domain as CEA publishes all relevant information[3]. Therefore, the project activity satisfies this applicability criterion.

As per the ACM0002/version 12.1.0, the main emissions potentially giving rise to leakage in the context of power sector projects are emissions arising due to activities such as power plant construction, fuel handling (extraction, processing, and transport), and land inundation (for hydroelectric projects). The methodology specifies that the project participants do not need to consider these emission sources as leakage in applying this methodology. Therefore, the leakage is considered as zero, Ly = 0. Similarly, the project activity does not claim any credit for the project activity on account of reducing these emissions below the level of the baseline scenario.

As per the calculations made in the DPR, the 24 MW hydro power plant operates 365 days a year at a plant load factor of 49.18 % generating *103,400 MWh* of power. The auxiliaries of the power plant are expected to consume *1,551MWh* of power @ 1.5% of the gross generation. Further, transmission losses have been assumed @ 1.5% of total generation, leading to a further reduction of *1,551MWh* of exported power.

[3] http://www.cea.nic.in/

However, CAR B1, CAR B2 and CAR B3 were raised during the validation and closed out successfully.

The methodology does not take into account the leakage that would arise from the import and export of electricity to the local grid. It is concluded that, since this is a Hydro power project, there would be minimum or no leakage and hence this is not considered significant.

### 5.2.2 Project Boundary

The spatial extent of the project boundary includes the project power plant and all power plants connected physically to the electricity system that the CDM project power plant is connected to. The project activity would be feeding the electricity in the Southern regional grid of India, managed by Regional Load Dispatch Centre (RLDC) and Regional Power Committees (RPCs) provide a common platform for discussion and solution to the regional problems relating to the grid, which constitutes to southern region of India. Thus all the power generation facilities connected to this grid form the project boundary is used for the purpose of baseline estimation.

As per the baseline study in the southern grid, it is estimated that the primary and critical source of GHG emission is the CO2 emissions from the conventional power generation systems, which is a part of the baseline study. The other likely emissions are that of CH4 and N2O, but both emissions were conservative and are excluded for simplification of the project. Also, indirect emissions can result from project construction, transportation of materials and other upstream activities. In the case of this project activity, these emissions are thought to be comparable or less to the life cycle emissions that would result from the eventual construction and operation of alternative power plant. The project does not claim emissions reductions from these activities. Therefore, no significant net leakage from the above activity was identified.

The methodology does not take into account the leakage that would arise from the import and export of electricity to the local grid. It is concluded that, since this is a Hydro power project, there would be minimum or no leakage and hence this is not considered significant.

### 5.2.3 Baseline Identification

The project activity involves installation, commissioning and operation of six Horizontal Pit type full Kaplan turbines & generating units of 4 MW each to generate 24MW of power utilizing a rated head of 4.8m and a design discharge of 601.02 cumecs, totally contributing 24 MW of power to the Southern regional grid of India. The project activity is the installation of a new grid-connected Hydro power plant and

the generated electricity is being sold to Southern Regional Grid of India. Hence, the baseline scenario is the following:

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

The following Baseline alternatives were available with the project participant for identification of baseline scenario:

Setting up the project activity without CDM benefits:

As per this alternative the project participant would have gone ahead with the implementation of the project activity, generating renewable electricity and exporting the same to the grid under the power purchase agreement thereby displacing equivalent amount of electricity generated by the currently running power plants in the grid.

No emissions of greenhouse gases to atmosphere through this alternative. This alternative may be a part of the baseline. However, this alternative faces investment barrier as shown by the investment analysis. Continuation of current scenario i.e. additional power is supplied by current power generating units and / or new power generating units coming up in the grid:

The installed capacity in the state stands at 8126.9 MW[4], out of which hydro contributes 3742.4 MW (**46%**)[5]. However, due to the low Plant Load Factor of Hydro plants, the actual generation (in MW) from these plants is much lower than thermal power plants.

Thus, the hydro power contributed only 5531420 MW(**16.51%)**[6] to the total power generated in the state of Andhra Pradesh during the year 2009-10 i.e. 33,502MU[7]. This makes it clear that the grid to which the SLS Hydro project intends to supply renewable electricity continues to remain fossil fuel intensive. Thus, continuation of current scenario has been chosen as the baseline scenario.

Other plausible and credible alternatives to the project activity:

The installation of a new fossil fuel based power plant is not a credible baseline as to undertake an investment on a similar scale is not feasible. Further, there are no coal linkages available to the PP in Andhra Pradesh nor is coal available at a competitive price. Also, excluding this baseline is conservative as coal would result in higher baseline emissions (due to its higher $CO_2$ intensity).

[4] http://www.apgenco.gov.in/inner.asp?frm=ourpowerplants
[5] http://www.apgenco.gov.in/inner.asp?frm=ourpowerplants
[6] http://www.apgenco.gov.in/inner.asp?frm=Performance_hydel
[7] http://www.apgenco.gov.in/inner.asp?frm=Performance_thermal

Thus, the assessment team concludes that the continuation of current scenario i.e. additional power is supplied by current power generating units and / or new power generating units coming up in the southern grid alone could be justified as realistic, credible and plausible alternative to the PP. However, this alternative would result in higher GHG emissions.

Thus, Validation Team is convinced that the project developer has taken into consideration all realistic and credible alternatives (having regard to the governing methodology) including the project being undertaken as a non-CDM activity and continuation of current scenario

### 5.2.4 Calculation of GHG Emission Reductions

In the absence of the project activity, equal amount of electricity would have been generated from the plants connected to the grid that gets power from most of the fossil fuel based plants. Hence, displacing the grid power by wind power is actually saving equivalent amount of GHGs emissions that can be estimated based on the grid emission factor.

The emission reductions from the project activity will occur directly from exports of electricity to the grid. Electricity is generated from Hydro energy, which is the cleanest renewable source of energy. A renewable source of energy is one, which gets replenished and does not undergo depletion due to its use. Electricity generation from project activity does not lead to any GHG emissions.

The energy supplied by project activity to the state grid would reduce anthropogenic GHG emissions as per the combined margin carbon intensity of the grid, which is mainly dominated by fossil fuel based power plants.

**Baseline emissions:**

The baseline emissions are calculated as per page 8 of the methodology – “Baseline emissions include only CO2 emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity, calculated as follows:

$BE_y = EG_{PJ,y} * EF_{grid,CM,y}$

Where:

$BE_y$ = Baseline emissions in year y (tCO2/yr).

$EG_{PJ,y}$ = Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year y (MWh/yr)

$EF_{grid,CM,y}$ = Combined margin CO2 emission factor for grid connected power generation in year y calculated using the latest version of the "Tool to calculate the emission factor for an electricity system" (tCO2/MWh)

As mentioned in the methodology, $EG_{PJ,y}$ is calculated as follows for greenfield renewable energy power plants:

$$EG_{PJ,y} = EG_{facility,y}$$

Where:

$EG_{PJ,y}$ = Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year *y* (MWh/yr)

$EG_{facility,y}$ = Quantity of net electricity generation supplied by the project plant/unit to the grid in year *y* (MWh/yr)

The electricity supplied by the project activity is calculated from the following equation:

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

Where:

$EG_{gross}$ = Gross electricity generation by the project activity in year y (MWh)

$EG_{aux}$ = Auxiliary consumption by the project activity in year y (MWh)

As per the calculations made in the DPR, the 24 MW hydro power plant operates 365 days a year at a plant load factor of 49.18 % generating 103,400 MWh of power. The auxiliaries of the power plant are expected to consume 1,551MWh of power @ 1.5% of the gross generation. Further, transmission losses have been assumed @ 1.5% of total generation, leading to a further reduction of 1,551MWh of exported power.

**Project Emissions:**

As per methdology, if the power density is greater than 10 W/$m^2$

$PE_{HP,y}$ =0

The power density of the project activity is calculated as follows:

$$PD = \frac{Cap_{PJ} - Cap_{BL}}{A_{PJ} - A_{BL}}$$

Where:

PD =Power density of the project activity, in W/m2

$C_{apPJ}$ =Installed capacity of the hydro power plant after the implementation of the project activity (W)

$C_{apBL}$ =Installed capacity of the hydro power plant before the implementation of the project activity (W). For new hydro power plants, this value is zero.

$A_{PJ}$ = Area of the reservoir measured in the surface of the water, after the implementation of the project activity, when the reservoir is full (m2)

$A_{BL}$ =Area of the reservoir measured in the surface of the water, before the implementation of the project activity, when the reservoir is full (m2). For new reservoirs, this value is zero."

Thus,

PD = (24,000,000 – 0)/ (125,000 – 0)
= 192 W/m2

The reservoir like area created by the tail race pond is 125,000 $m^2$, which gives a power density of 192 W/ $m^2$. Since this is greater than 10 W/ $m^2$, the project emissions are zero.

$$PE_{HP,y} = 0$$

**Project emissions due to Onsite DG set:**

Furthermore, as per para 79 of VVM version 01.2, PP is monitoring the project emission due to Diesel combustion by standby DG set. Assessment team confirms the calculation approach to be correct.

**Leakage Emissions:**

As per the ACM0002/version 12.1.0, the main emissions potentially giving rise to leakage in the context of electric sector projects are emissions arising due to activities such as power plant construction, fuel handling (extraction, processing, and transport), and land inundation (for hydroelectric projects). The methodology specifies that the project participants do not need to consider these emission sources as leakage in applying this methodology. Therefore, the leakage is considered as zero, Ly = 0. Similarly, the project activity does not claim any credit for the project activity on account of reducing these emissions below the level of the baseline scenario.

**Emission Reductions:**

The project activity reduces carbon dioxide emissions through displacement of grid electricity generation with fossil fuel based power plants by renewable electricity. The emission reduction ERy due to project activity during a given year y is estimated as the difference between baseline emissions (BEy) and project emissions (PEy).

$ER_y = BE_y – PE_y – L_y$

Where,
BEy = Baseline emissions in the year y in tCO2
PEy = Project emissions in the year y.
Ly = Emissions due to leakage in the year y.

Here,
PEy = 0 for the project activity as per the methodology.
Ly = 0 for the project activity.

Therefore, **$ER_y = BE_y$**

All the values selected for the calculation of Grid emission factor is as per CEA version 05 which is an official document from Govt of India to calculate operating margin (OM), Build Margin (BM) and the combined margin (CM). All the values of OM, BM and CM are cross checked by the validation team and the calculated emission reduction value is thus conservative as per the stipulated methodology and hence found correct.

However, CAR B11 and CAR B12 were raised during the Validation process and closed out successfully.

### 5.2.5 Additionality Determination

**Consideration of CDM in decision making (if project start before validation)**
The project developer has stated the start date of the project activity is October 5, 2009 and has submitted a copy of the civil works contract signed with M/s. Sri Lakshmi Constructions Ltd. as evidence. The project developer had stated that he had not undertaken any construction or any real action on the implementation of the project activity prior to this date. Since the *real action of the programme activity* had begun on October 5, 2009, as per Glossary of CDM terms (Version 05), this date has been treated as the start date of the project activity. As the real action of the project activity had begun after 02 August 2008, the project activity falls under the category of *new project activity* as per paragraph 100 of VVM (1.2).

The PDD was web-hosted for public comments on April 10, 2010, i.e., after the start date of the project activity. Since the start date of the project activity was after 2nd August 2008 and the PDD was web-hosted after the start date, as per paragraph 2 of Annex 22, EB 49, project participant is required to inform the Host Party DNA and the UNFCCC secretariat in writing of the commencement of the project activity and of their intention to seek CDM status and such notification must be made within six months of the project activity start date. Accordingly, the project developer had informed both UNFCCC and DNA on 16th November 2009 (start date being 5th October 2009) about the commencement of the project activity and their intention to seek CDM status. Copies of correspondence with UNFCCC have been submitted to

validation team. Besides, validation team also checked the UNFCCC website[8] [as required vide paragraph 101 of VVM (01.2)] and satisfied itself that the project developer had informed UNFCCC within the stipulated 6 months period.

Since the project fulfills the condition stipulated vide paragraph (2) of Annex 22 of EB 49 and paragraph 100 and 101 of VVM (01.2), Validation Team concludes that *there was a prior consideration of CDM and CDM was seriously considered in the decision to implement the project activity.*

**Application of methodology / methodological tools**

The project is a large scale project. Hence, the Additionality Tool (Ver 05.2) applies to the project activity. Therefore, in accordance with ACM0002, the additionality was demonstrated based on the valid version of the "Tool for demonstration and assessment of additionality (Ver 05.2)". For the above reasons, this approach has been assessed to be appropriate for the assessment of additionality for this project activity.

Project developer had chosen investment barrier and to demonstrate the investment barrier had selected benchmark analysis and project IRR as financial indicator. Having regard to the fact that the project involves investment and is funded by a mix of debt and equity, project IRR is an appropriate financial indicator for the project type and decision making context. Since in this instant case, as subsequent section would reveal, baseline is outside the direct control of the project developer (grid connected power) and hence, the choice of the project developer is restricted to 'invest or not to invest', the benchmark approach is most suited as per Guidance 16 of Annex 58 of EB 51.

*In the above background Validation Team concludes that the additionality justification given by the project developer is in accordance with the requirements derived from the approved CDM methodology and the methodological tools referred therein and also conforms to guidance given by EB vide paragraph 110 of VVM (Ver 1.2).*

**Alternatives**

This is a hydro power project and is based on the Methodology ACM 0002 (Ver. 12.1.0). The methodology states,

*"If the project activity is the installation of a new grid-connected renewable power plant/unit* (which the project is)*, the baseline scenario is the following:*

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

[8] http://cdm.unfccc.int/Projects/PriorCDM/notifications/index_html?s=3900 (24 MW Dummagudem Hydel Project by M/S SLS Power Corporation Limited)

Paragraph 105 of VVM states that PDD is required to identify credible alternatives to the project activity in order to determine the most realistic baseline scenario, unless the approved methodology that is selected by the proposed CDM project activity prescribes the baseline scenario and no further analysis is required. Since the approved methodology ACM 0002 used by the project activity prescribes the baseline scenario, no further analysis of alternatives is required for the project activity.

*Validation Team, therefore, concludes that the PDD and the validation report conforms to the guidance given by EB vide paragraph 105 of VVM (Ver.1.2)*

**Investment analysis**

PDD provides that the project would not be economically or financially feasible, without the revenue from the sale of certified emission reductions (CERs). The claim of the project developer that the project scenario is not economically feasible without benefits from CER sales has been assessed by the Validation Team through following steps:

a) Suitability of investment analysis, financial indicator and benchmark: Project developer had demonstrated that the financial returns of the proposed CDM project activity would be insufficient to justify the required investment (Paragraph 109 (c) of VVM). For demonstrating the financial unattractiveness of the project activity, project developer had chosen investment barrier and to demonstrate the investment barrier had selected benchmark analysis Since in this instant case, as subsequent section would reveal, baseline is outside the direct control of the project developer (grid connected power) and hence, the choice of the project developer is restricted to "invest or not to invest", the benchmark approach is most suited as per the latest version of Guidance 16 of Annex 58 of EB 51.

*In the above background, as subsequent paragraphs would reveal, Validation Team concludes that the additionality justification given by the project developer is in accordance with the requirements derived from the approved CDM methodology and the methodological tools referred therein as well as the guidance given by EB vide paragraphs 108-110 of VVM (01.2).*

The project developer has chosen project IRR[9] to demonstrate the additionality of the project. As stated above, considering the fact that the project is financed by a mix of debt and equity and that guidance 12 of Annex 58, EB 51 permit the use of project IRR as one of the financial indicators to demonstrate additionality, project IRR has

[9] In the webhosted PDD, project developer had used equity IRR to demonstrate additionality and expected/required rate of return on equity computed as per CAPM was used as the benchmark. However, consequent upon the CARs raised on the appropriateness of using equity IRR as financial indicator to demonstrate additionality (the DPR also uses project IRR) and on the expected/required return on equity computed using CAPM used as benchmark, project developer had chosen to demonstrate additionality with project IRR and commercial lending rate prevailing at the time of decision making as the benchmark.

been considered as appropriate financial indicator for the project type and decision making context.

As per guidance 12 of Annex 58, EB 51, **"***Local commercial lending rates* or weighted average costs of capital (WACC) are *appropriate* benchmarks for a project IRR"[10]. The project developer has chosen the Prime Lending Rate (PLR), which is the commercial lending rate, as the benchmark. Since the PP has chosen project IRR as financial indicator, selection of PLR as benchmark conforms to Guidance 12 of Annex 58, EB 51. At the time of decision making the PLR (evidenced by publications by the Reserve Bank of India) ranged between 13.25% and 14.00%[11]. PLR represents the commercial lending rate of banks. Therefore, the PLR as benchmark conforms to guidance 12 of Annex 58, EB 51. Moreover, since the PLR is publicly available and can be validated by DOE, it also conforms to guidance 13 of Annex 58, EB 51. PP has chosen the average of PLR, viz., 13.63% as benchmark[12].

*Therefore, the Validation Team concludes that the benchmark selected by the project developer is suitable for the financial indicator selected and is conservative. Since the financial indicator breaches the benchmark only with CDM benefits, Validation Team considers that it is reasonable to assume that the investment would not have taken place at a return lower than the benchmark and the CDM benefits were decisive factor in taking the investment decision.. Therefore, the selected benchmark is appropriate and conforms to paragraph 112 (a) and (c)[13] of VVM (1.2).*

b) Parameters and assumptions used: The project concept involves installation of 6 X 4 MW turbines, generating103.4 mn. kWh and selling 100.3 mn. kWh to Tata Power at an agreed tariff of Rs.3.50/kWh after accounting for the auxiliary consumption and grid outages of 3% (i.e., 3.1 mn. kWh). The three important parameters, which determine the project IRR of the project, are project cost, financing pattern, and profitability estimates.

Project cost: The project cost includes land, civil works, E& M works, transmission lines, contingencies and IDC. All these costs are based on Detailed Project Report,

[10] Annex 58 of EB 51, Guidance on the Assessment of Investment analysis, item 12

[11]. The PLR is sourced from the RBI Weekly Statistical Supplement (Sept. 12, 2008) published by the Reserve Bank of India, which was available to the PP at the time of decision making (i.e., Sept. 15, 2008). The rate can be accessed from http://rbidocs.rbi.org.in/rdocs/Wss/PDFs/86924.pdf This rate pertains to Aug. 29, 2008. The PLR as of Sept 12-19. 2008 can be sourced from Oct. 3, 2008 issue (which was not available to the PP at the time of decision making). There was no change in the PLR subsequently also and that it remained within the same range. Please see http://rbidocs.rbi.org.in/rdocs/Wss/PDFs/87284.pdf.

[12] In the webhosted PDD, the benchmark given was 15.77% for equity IRR. Neither guidance nor VVM prohibit the PP from selecting the upper end of the range. Moreover, the range as published by RBI represents the BPLR charged by 5 major banks and hence, Therefore, the selection of mid range is conservative and appropriate

[13] Paragraph 112 (b) does not apply to the project as no risk premium has been applied in determining the benchmark

prepared[14] in August 2008. The investment decision was taken in September 2008 based on the DPR. Since, the time gap between the finalization of the DPR and the decision making is less than a month, validation team confirms that it is unlikely in the context of the underlying project activity that the input values would have materially changed [conformity to paragraph 113 (a) of the VVM (01.2)]. Validation team also compared the input parameters used in the PDD/worksheet with that of DPR and observed that the figures have been consistent [conformity to paragraph 113 (b) of the VVM (01.2)].

The cost as per the DPR[15] works out to Rs. 1843.5 mn., yielding a cost of Rs.76.8 mn. per MW. IREDA, the financing institution, has, however, estimated the cost at Rs.1814.7 mn., yielding a cost of 75.6 mn./MW. Validation team compared the cost with other projects (having start date of 2008 or after) and observed that the implementation of all registered projects commenced before 2008. However, of the projects under validation (whose PDD have been webhosted), validation team observed that the cost was ranging between Rs.48.05 mn./MW to Rs.79.86 mn./MW[16]. Though the cost of the candidate project is within the range, since the cost is closer to the higher end of the range, validation team sought a justification for such a high cost by a reputed third party engineering company. In response, the project developer had submitted a report from M/s Dado Hegde Technocrats (P) Ltd[17], a third party engineering and consultancy company.

The company has attributed the high cost to low head (4.8 meter) and high discharge. This has resulted in an increase in runner diameter (4.2 meter) of turbine and consequent increase in stayring assembly, size of the runner assembly and associated components connected to gear box, leading to a corresponding increase in auxiliary systems like cooling water system, drainage and dewatering system and compressed air system etc. The report also observed that due to low head, the project had to choose pit type turbine requiring excavation at very low level thereby increasing the excavation cost and civil works. Besides the third party justification, since the actual investment itself is expected to be around Rs.2200 mn., validation team accepted the cost as per DPR, though the cost as approved by financial institution is marginally lower. Validation team also observed that the consideration of cost as finalised by financial institution does not render the project non-additional in

[14] Detailed Project Report has been prepared by Engineering Consultants Group (ECG), a leading hydro electrict project consultancy company. The company has prepared DPR/FSR for more than 40 hydro power projects and detailed engineering drawings for more than 15 hydro power projects so far.

[15] Most of the input parameters are used in the financial indicator calculations are based on DPR. Since the DPR was prepared in August 2008 and the investment decision is reported to have been taken on 15/09/2008, the time gap is so short that the input parameters value would not have altered.

[16] It was observed that 5 MW Binua Parai small Hydro Electric Project (02/2008) projected a cost of Rs 66.6 mn./MW; 24 MW Tunga Mini Hydel project (04/2009) projected a cost of Rs.48.05 mn./MW; 4.05 MW Champamati Small Hydro Power Project (07/2008) projected a cost of Rs.79.86 mn./MW; 120 MW grid connected Rangit IV Hydro Power Project (08/2009) projected a cost of Rs.64.61 mn./MW and 4.9 MW Darna Small Hydro Power Project ((10/2008) projected a cost of Rs.60.54 mn./MW.

[17] M/s Dado Hegde Technocrats *P) Ltd. Is a design and engineering consultancy company which provides electro mechnical services from concept to completion besides preparation of DPRs, consultancy on transmission lines, substations etc. among others

as much as the IRR goes up by 23 basis points – from 12.76% to 13.00% - in contrast to the benchmark of 13.63%. However, in view of the fact that this cost was not available to the project developer at the time of decision making and that the actual completion cost is expected to be Rs.2200 mn. validation team considered it appropriate to consider the cost estimated in the DPR, which is in conformity with guidance 6 of Annex 58, EB 51.

Financing Pattern: The project is assumed to be funded by equity capital of Rs.553 mn. and term loan of Rs.1290 mn., though IREDA had sanctioned a loan of Rs.1250 mn. only. The loan had been sanctioned at an interest rate of 12.15%. However, for the purpose of additionality demonstration, term loan had been considered at Rs.1290 mn only. In case the actual loan sanctioned is taken into consideration, IRR will go down by 2 basis points from 12.76% as presented to 12.74%, rendering the project all the more additional. Hence, the interest calculations are conservative from additionality demonstration perspective.

The project financing pattern yields a gearing of 70:30. In India, infrastructure projects are generally entitled to a debt equity ratio of 70:30, though depending on the case the ratio can be marginally higher or lower. APERC itself recommends a debt equity ratio of 70:30 for small hydro electric power projects. As the debt equity ratio is in conformity with the gearing recommended by APERC, the validation team is convinced that the financing pattern assumed is appropriate and correct for the project activity. Consideration of actual gearing achieved (68:32), as stated above, does not render the project non-additional. Hence, the gearing considered is conservative from additionality demonstration point of view.

Profitability Estimates: The profitability estimates of the project, which forms the basis for IRR calculation is based on installed capacity, PLF, power tariff, O&M cost, interest, depreciation, taxation. The installed capacity is based on the capacity of turbines, which is evidenced by the DPR and purchase orders. As per Annex 11, EB 48, the plant load factor (PLF) should be defined ex-ante according to one of the following two options:

(a) The plant load factor provided to banks and/or equity financiers while applying the project activity for project financing, or to the government while applying the project activity for implementation approval;
(b) The plant load factor determined by a third party contracted by the project participants (e.g. an engineering company).

Generation has been estimated based on the study of discharge data for the last 12 years by the Engineering Consultants Group, a well known techno-economic consultancy company. Project developer has submitted a copy of the DPR which incorporates the estimation of generation. The report estimates the generation at 103.4 mn. units per annum. This yields a PLF of 49.18%. APERC[18] has

[18] http://www.aperc.gov.in/OtherOrders/EarlierOrders.html (Order on Purchase of Power from NCE projects, March 20, 2004, p.47)

recommended PLF of 35%. Since the PLF conforms to the requirements of Annex 11, EB 48, and more than the PLF recommended by APERC, PLF is considered suitable and appropriate for the project activity.

Project developer has assumed Auxiliary consumption and grid outage at 3%. APERC has recommended Auxiliary consumption of only 1%. To a CAR raised, project developer has submitted a detailed calculation from the machinery suppliers on the estimation of losses provided. The losses include losses of 159.10 KW at 132 Kv transmission line, 150 KW at excitation transformer and 416.50 KW at power house (415V auxiliary loads) of 416.50 KW resulting in a total loss of 725.50 KW. With the installed capacity being 24000 KW, the loss works out to 3.02%, say 3%. Validation team observed that other hydropower projects have also assumed auxiliary consumption and other losses from as low as 0.9% to as high as 9.07%. For example registered projects, 24 MW Sri Ranganathaswamy Mini Hydel Project (No. 1345) and 24 MW Someshwara Small Hydropower Project (No. 1273) – both located in the neighbouring state, Karnataka, have assumed a loss of 3%. Projects under validation, viz., 10 MW Manjanadka Hydro Power project, located in Karnataka has assumed loss of 4%; 6 MW Dadupur Hydro Power project located in Haryana has assumed loss of 9.07% and Darna small Hydropower Project located in Maharashtra has assumed loss of 6%. In the above, background, validation team considers the auxiliary consumption and losses of 3% as reasonable as it is based on the DPR and other projects have also assumed a similar or more auxiliary consumption and losses. However, validation team thought it appropriate to provide a FAR on the following lines:

"*The auxiliary consumption will be monitored periodically and in case the auxiliary consumption is less than 3%, the financial additionality of the project should be revisited*"

Project developer has signed a PPA with M/s Tata Power Company Ltd. whereby the project would be paid Rs.3.50/kWh. The tariff is higher than the tariff recommended by APERC (Rs.2.60/kWh in the first year going down to Rs.1.88/kWh in the 10$^{th}$ year). Moreover, none of the registered IPPs have considered a tariff of even Rs.3/MWh. Hence, validation team considers the tariff appropriate and conservative

O&M cost is based on the DPR. It includes operating and maintenance cost and administration cost. O&M cost accounts for 1.7% of the project cost or Rs.1.28 mn./MW. APERC has recommended 1.5% for O&M cost[19]. Validation team checked the other projects and observed that the O&M cost ranges from Rs.0.6 mn./MW (24 MW (Tunga Mini Hydel Power Project) to Rs.2 mn./MW (120 MW Rangit IV Hydro power project and 10 MW Manjanadka Hydro Project). Therefore, validation team has accepts this cost as reasonable. Since this is a stand-alone project and the O&M cost would take care of only the operations and maintenance of the project,

[19] http://www.aperc.gov.in/OtherOrders/EarlierOrders.html (Order on Purchase of Power from NCE projects, March 20, 2004, p.48)

administration expenditure of Rs.0.55 mn. per month is considered appropriate and reasonable.

Interest has been computed based on the loan sanction letter issued by IREDA. This is in conformity with guidance 11 of Annex 58, EB 51, which states that where post tax benchmark is used the DOE shall ensure that *actual interest payable* is taken into account in the calculation of income tax. The interest rate (and other terms of loan) considered in the DPR is also the same. Validation team also observed that the project remains additional, even if the rate of interest is considered at 14% (the rate prevailing at the time of decision making) instead of 12.15%, in that the IRR goes up by 6 bps. i.e., from 12.76% to 12.83%.

The project developer has adopted CERC[20] recommended depreciation rate for computing book profit and Income Tax Act stipulated WDV depreciation for income tax calculation, which are accepted accounting methods. Since normally the companies use book depreciation rate as stipulated in Schedule XIV of Companies Act, clarification was sought on the basis of using CERC recommended book depreciation as it impacts additionality. In response, project developer has submitted an undertaking that the company uses CERC recommended depreciation rates in its books. However, validation team thought it appropriate to insert a FAR on the following lines:

"*The book depreciation rate used will be monitored during the first verification and in case it is observed that the company has opted for Schedule XIV depreciation instead of CERC recommended depreciation, financial additionality will be revisited*".

The block of assets has been computed for depreciation purpose as per the accepted accounting principles. Tax liability has been calculated as per the income tax rules and the rulings given. In computing the income tax liability, the project developer has taken into account the depreciation (15% for plant and machinery and 10\5 for civil works), which the hydropower project is entitled to under Income Tax Rules (Appendix I) and the Tax holiday (u/s 80IA of the Income Tax Act, 1961), which the infrastructure projects (under which the project activity falls in as much as it generated electricity) are entitled to for 10 consecutive years out of the first 15 years. The tax rate assumed corresponds to the tax rate prevailing at the time of taking decision (conformity to guidance 6 of Annex 58, EB 51)

*Since the input parameters have been sourced from the DPR, quotations, loan sanction letters, acts and regulations, they were valid at the time of decision making, (or modified to ensure conservativeness in the computation of financial indicator), are reliable, credible and appropriate for the project activity. Thus, the Validation conforms to the guidance given vide paragraph 111(a) & (b), 113 and 114 of VVM (1.2).*

[20] Appendix II, Depreciation Schedule; http://www.cercind.gov.in/13042007/Appendix-II.pdf

c) Cross checking parameters: The cost of project, generation, auxiliary consumption, power tariff, O&M cost, interest costs, depreciation and tax rate have been cross checked with DPR, PPA, Tariff order, loan sanction letter furnished by the project developer, Income Tax Act. As mentioned above, the input parameters have also been checked with other projects – already registered and under validation. The documents supporting the financial calculations, in the opinion of Validation Team, are authentic and appropriate. CARs and CLs were raised on non-conformities and they were set right. With the corrections having been incorporated, the input costs considered appear to be in order. All the input parameters considered in computation, the basis, correctness and appropriateness thereof are given in Table A-3 along with Validation Team's comments. Validation, therefore, conforms to guidance given vide paragraphs 111 of VVM (1.2).

d) Financial reports of project participant: Validation team requisitioned the Annual Report of the project developer. Since the project is still under implementation stage, none of the input values taken in the computation can be based on the Annual Report.

e) Assessment of correctness of computation: The assessment involved checking the data input taken from quotation/purchase order/loan sanction letter/documents, adoption of correct accounting principle and arithmetical accuracy. Validation Team checked the documents and ensured that right input has been taken in the project cost and projections. In several places, the calculations were not conforming to accepted accounting principles and the laws and regulations in force necessitating CARs and CLs. Based on the CARs and CLs, corrections were incorporated. The accounting principles adopted with respect computation of interest, block of assets and tax computation were found to be in order in the corrected version presented. The arithmetical accuracy was also found to be correct.

The project IRR has been computed for a period of 25 years, which is the life time of the project and is in conformity with the Annex 58 of EB 51 and Annex 15 of EB 50[21]. As required by Annex 58 of EB 51 the expected realisation on the sale of assets at the end of the operating life has been taken as *salvage value* in the terminal year. Project developer has provided refurbishing cost of Rs. 163 mn. in the 11$^{th}$ year of operation as per DPR. This is in conformity with guidance 3 of Annex 58, EB 51. In computing the IRR, the project developer has taken into account profit after tax, depreciation and interest on term loan and salvage value (in the terminal year). The principle adopted conforms to the accepted accounting and taxation principles.

Based on the above, the project IRR works out to 12.76%[22] in contrast to the benchmark of 13.63%. In the above background, the Validation Team is convinced that the project is additional and not a business-as-usual scenario.

[21] The life of the plant is based on the manufacturer's information on technical life time of the project
[22] In the webhosted PDD, the financial indicator (equity IRR) was 11.97%, which is not comparable to the project IRR

Sensitivity analysis: The Guidance on Assessment of Investment Analysis requires the robustness of the conclusion arrived at to be proved through a sensitivity analysis by varying the critical assumptions to a reasonable variation. The project developer has identified project cost, generation, tariff and O&M cost as critical assumptions. These constitute more than 20% of the project cost/revenue. Guidance 18 of Annex 58 of EB 51 states that as a general point of departure, variations in the sensitivity analysis should at least cover a range of +10% and –10%, *unless this is not deemed appropriate in the context of the specific project circumstances*. Since the project cost is already facing a cost overrun, PLF is higher than what has been recommended by APERC and the power tariff is fixed by the PPA signed with Tata Power, PP has considered a variation of ±5%. Having regard to the circumstances, the variation chosen by the PP is considered appropriate. The sensitivity analysis reveals that even under more favorable conditions, the IRR would not cross the benchmark return as given in the following table:

| Variables | -5% | 0% | +5% |
|---|---|---|---|
| Project cost | 13.54% | 12.76% | 12.05% |
| Generation | 11.85% | 12.76% | 13.65% |
| Tariff | 11.96% | 12.76% | 13.54% |
| O&M Cost | 12.88% | 12.76% | 12.65% |
| Benchmark | 13.63% | | |

Validation Team carried out its own independent assessment, which reveals that the project would become *non additional* if

- Project cost comes down by 5.5%
- Generation goes up by 4.85%
- Tariff goes up by 5.6%
- O&M cost goes down by 38%

PP has submitted that such a reduction in project cost or increase in PLF or tariff is highly unrealistic and unlikely to happen and reasoned out as follows:

Project cost: As stated above, the cost is based on DPR and the project is already experiencing cost overruns. The project cost is expected to be Rs.2200 mn.. Hence, the question of any reduction in the cost is ruled out.

Generation: Generation is based on 12 year discharge data and hence the possibility of any increase on a perennial basis is ruled out; moreover, the generation is more than APERC recommended PLF. Therefore, generation of 105.16 mn. units of electricity on sustained basis for the next 25 years is highly hypothetical and unrealistic.

Tariff: The tariff is based on the PPA signed with Tata Power. The tariff is subject to revision on either side. With so many power projects under installation, the power supply would substantially increase in the times to come. Annual energy production had gone up from 190 billion kWh in 1986 to more than 680 billion kWh in 2006. According to a research report published by Citigroup Global Markets, India is expected to add up to 113 GW of installed capacity by 2017. Further, renewable capacity might increase from 15.5 GW to 36.0 GW[23]. In the above background, energy is likely to become a buyers' market. Therefore, any increase in power tariff is unlikely.

O&M cost: The financial indicator is not sensitive to O&M cost at all as even if the O&M cost goes down by 35%, the project will not lose its additionality. Any reduction in O&M cost is highly unrealistic as this cost represents only wages, salaries and consumables and spares, all of which are subject to inflationary pressure.

Validation Team is in agreement with the reasoning given by the PP and hence concludes that such an increase in tariff or generation or reduction in project cost or O&M cost is unrealistic and hypothetical.

Having regard to the assessment of conformity of additionality demonstration and benchmark selection to the latest version of the guidance issued by EB on the assessment of investment analysis, plausibility and appropriateness of parameters used and correctness of financial calculations, Validation Team concludes that the project scenario is not economically feasible without benefits from CER sales

**Barrier analysis**

Project developer did not consider barrier analysis. Hence, this is not applicable.

**Common practice analysis**

Since it is a large scale project, as per paragraph 118 of VVM (01.2), common practice analysis is required to be carried out as a credibility check of the other available evidence used by the project participants to demonstrate additionality. This is a test to complement the investment analysis to confirm that the project activity is not widely observed and commonly carried out in the region.

For the purpose of common practice analysis, project developer has chosen Andhra Pradesh as geographical region. Since renewable energy projects are governed by the State ERC rules and regulations and that the regulatory framework and operating conditions of hydropower projects differ from State to State, validation team considers selection of Andhra Pradesh state is appropriate.

[23] See Electricity Sector in India ; http://en.wikipedia.org/wiki/Electricity_sector_in_India

As per the information available on the website of the Ministry of New and Renewable Energy (MNRE)[24], Government of India, 57 projects small hydro projects (capacity under 25MW as per MNRE rules) have been commissioned in the state of Andhra Pradesh, involving a total capacity of 178.85 MW and 11 projects are reported to be under commissioning. As per step 4 of Additionality Tool, only projects in operation need to be considered and hence, 11 projects are outside the purview of common practice analysis. Out of the 57 projects, 17 projects are in public sector.

Of the balance 40 projects, only one project had an installed capacity of 10 MW (which has applied for CDM but rejected by CDM)against the candidate project's installed capacity of 24 MW. The installed capacity of other projects ranged between as low as 500 KW to 7500KW. Hence, these projects are not comparable to the project activity in terms of the scale. Since, the individual turbine capacity of these projects are not available in the public domain, comparison of the project based on the turbine capacity is not possible. This is in conformity of step 4 of additionality too which states, "If necessary data/information of some similar projects are not accessible for PPs to conduct this analysis, such projects can be excluded from this analysis",

Based on the above, validation team has come to the conclusion that setting up of large scale hydro power projects is not a common practice in Andhra Pradesh. Thus, validation team had taken cognizance of paragraph 119, 120 and 121 of VVM (01.2)

**Summary**

In the above background, Validation Team concludes that the project is not a business-as-usual scenario and is additional. The CDM benefits would enable the project to become financially attractive in as much as the project IRR with CDM benefits (15.54%) would cross the benchmark (13.63%) and hence CDM benefits would enable the project developer to overcome the barrier.

Nevertheless, CARs under finding B.4 -10 (7 issues) and CLs under finding B.1-8 (8 issues), were raised and successfully closed (ref Annex: Validation Protocol).

### 5.2.6 Monitoring Methodology

The project applies approved baseline and monitoring methodology ACM0002 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources"; Version 12.1.0

[24] Available under http://www.mnre.gov.in/Programmes/ Scheme/ Grid Interactive and Off Grid/ Distributed Renewable Power/Small Hydro Power/State-wise details of the installed/under installation projects

### 5.2.7 Monitoring Plan

The project applies the monitoring methodology ACM0002/Version 12.1.0:“Consolidated baseline methodology for grid-connected electricity generation from renewable sources”.

This methodology stipulates that monitoring shall consist of net electricity exported from the project activity, total electricity generated from the project activity and operating margin emission factor and build margin emission factor of the grid, where ex post determination of grid emission factor has been chosen. Since the baseline methodology is based on ex ante determination of the baseline, the monitoring of operating margin emission factor and build margin emission factor is not required

Monitoring shall consist of metering the net electricity supplied to the grid, turbine gross generation and any auxiliary consumption of electricity in the project activity.
An internal audit will be carried out every year at the power plant to ensure that these parameters are being monitored in accordance with the project PDD. These readings can be verified from the monthly JMRs undertaken by representatives of M/S SLS Power Corporation Limited & the grid. The PP will then raise monthly electricity sales invoices to the grid/Tata Power (the end user of the generated energy) based on these JMRs. The same figure will be reported to Ecolutions (the CDM consultant) in order to estimate the monthly emission reductions.

PP will also monitor gross generation from the turbine/s and any auxiliary consumption. There will be three 8 hour shifts and the readings from energy meter/s will be taken on an hourly basis by the shift supervisor and recorded in logbooks. This hourly data will be signed off at the end of every shift by the engineer in charge of the shift and again at the end of each day by the power plant manager. The power plant manager will analyze the data every month and report to the head office. The data will be archived electronically every month and invoices of electricity sales will be maintained. All the meters used in the project activity will be calibrated on an annual basis.
Furthermore, as project emissions are anticipated due to Diesel combustion by onsite DG set, PP is monitoring Diesel consumption, NCV of Diesel and Emission factor.

However, CAR B13, CAR B14 and CAR B15 were raised during the validation and closed out successfully.

### 5.2.8 Project Management Planning

Project proponent will be monitoring gross generation from the turbine/s and any auxiliary consumption. There will be three 8 hour shifts and the readings from energy meter/s will be taken on an hourly basis by the shift supervisor and recorded in

logbooks. This hourly data will be signed off at the end of every shift by the engineer in charge of the shift and again at the end of each day by the power plant manager. The power plant manager will analyze the data every month and report to the head office. The data will be archived electronically every month and invoices of electricity sales will be maintained.

Internal audit will be carried out every year at the power plant to ensure that these parameters are being monitored in accordance with the project PDD.

The generation energy meter /s will be calibrated annually as per CDM guidelines. The net electricity supplied to the grid can be cross checked against invoices raised by the PP to the grid.

All data will be archived electronically and kept for a minimum of 2 years following issuance of certified emission reductions or the end of the crediting period.

### 5.2.9 Crediting Period

The start date of the crediting period is mentioned as 30/06/2010.which is not valid now, hence, based CAR C1, PP shifted the crediting period to 01/10/2011considering the progress of the validation which is found to be appropriate. PP has chosen fixed crediting period for the project activity i.e. 10 years which is consistent in the entire PDD. The start date of crediting period will be the date of registration of project activity with the CDM Board, whichever is later.

### 5.2.10 Environmental Impacts

As the project activity is a run-of-river type hydro power project, therefore environmental impacts typically associated with hydro power plants such as construction of dams, inundation of large areas and change in waterways do not occur. All the guidelines provided by the Ministry of Environment and Forests will be followed during the construction and operation of the project

The environmental impacts are not considered significant. After the completion of the construction of the project, the project will be put into operation only after inspection and acceptance of Andhra Pradesh State Pollution Control Board (AP SPCB), obtained through a 'Consent to Establish/Operate'

Further, As per the Schedule 1 of notification issued by Ministry of Environment and Forests (MoEF), Government of India on September 14, 2006, thirty-nine activities are required to undertake environmental impact assessment studies[25] .The proposed project activity does not fall under the list of activities requiring EIA as it will not

[25] http://envfor.nic.in/legis/eia/so1533.pdf

involve any negative environmental impacts. Thus, no detailed EIA study was conducted. However, an in-house environmental impact assessment was conducted by the PP and was checked by the validation team and found OK.

### 5.2.11 Comments by Local Stakeholders

M/S SLS Power Corporation Limited conducted a stakeholder's consultation meeting on 28th December 2009 at the project activity site, Dummagudem village, Bhadrachalam Taluka ,Khammam District, to get the comments and suggestions of the local stakeholders on the project activity. Following are the stakeholders identified for the project activity:

- Local Community
- Non Government Organizations
- Village Panchayat
- Consultants

A notice was placed in the local Telugu newspaper, the Andhra Jyothi on 22nd December 2009 and a total of 30 people attended the meeting. The representatives of M/S SLS Power Corporation Limited and Ecolutions were also present, in order to discuss the CDM benefits accrued from this project[26].

The Andhra Pradesh State Pollution Control Board had also invited the people in the surrounding areas of the project activity for a public hearing on 25th December 2007 and asked them to raise their concerns and suggestions with respect to the project activity. The Government of Andhra Pradesh state had made it mandatory for all hydroelectric projects proposed in the region to undertake a public consultation before the start of the implementation of work. The project data must be made publicly available by the project owners in national and local dailies and invite comments for a period of 60 days.

[26] Evidence for the meeting will be provided to the DOE during validation.

# 6 VALIDATION OPINION

M/s M/S SLS Power Corporation Limited has commissioned the TÜV NORD JI/CDM Certification Program (CP) to validate the project: "24 MW Dummagudem Hydel project by SLS Power Corporation Limited" with regard to the relevant requirements of the UNFCCC for CDM project activities, as well as criteria for consistent project operations, monitoring and reporting. UNFCCC criteria include article 12 of the Kyoto Protocol, the modalities and procedures for CDM (Marrakech Accords) and the relevant decisions by COP/MOP and CDM Executive Board

In the course of the pre-validation 19 Corrective Action Requests (CARs),17 Clarification Requests (CLs) and 1 FAR were raised and successfully closed.

The review of the project design documentation and additional documents related to baseline and monitoring methodology; the subsequent background investigation, follow-up interviews and review of comments by parties, stakeholders and NGOs have provided TÜV NORD JI/CDM CP with sufficient evidence to validate the fulfilment of the stated criteria.

In detail the conclusions can be summarised as follows:

- The project is in line with all relevant host country criteria (India) and all relevant UNFCCC requirements for CDM. Project activity approval have been obtained from DNA of India vide the Letter of Approval (HCA) dated 18th August 2010
- The project additionality is sufficiently justified in the PDD.
- The monitoring plan is transparent and adequate.
- The calculation of the project emission reductions is carried out in a transparent and conservative manner, so that the calculated emission reductions of 892,670tCO2e are most likely to be achieved within the 10 year fixed crediting period.

The conclusions of this report show, that the project, as it was described in the project documentation, is in line with all criteria applicable for the validation.

Mumbai, 2011/06/28

Manojkumar Borekar
TÜV NORD JI/CDM CP
Validation Team Leader

Essen, 2011-06-28

Martin Saalmann
TÜV NORD JI/CDM CP
Final Approval

# 7 REFERENCES

**Table 7-1**: Documents provided by the project participant

| Reference | Document |
|---|---|
| **/AR/** | Extract of Provisional Annual Reports for M/S SLS Power corporation ltd. 2006-07, 2007-08 and 2008-09 |
| **/CA/** | Charted account certificate for the project cost expenditure incurred and to be incurred dated 10/07/2010 |
| **/CERC/** | CERC Tariff order No.L-7/145(160)/2008-CERC dated 19th January 2009 |
| **/CP/** | Capacity proof of Turbine & generator specifications |
| **/DADO/** | Technical justification from DADO regarding the reasons for increase the project cost dated 10/09/2010 |
| **/DPR/** | Detailed Project Report for the project activity dated August 2008 |
| **/EIA/** | Environmental Impact Assessment study carried out for the project |
| **/ER/** | • Draft Emission reductions work sheet<br>• Final Emission Reduction work sheet |
| **/FA/** | Finance Act 2008-09 |
| **/HCA/** | Host Country approval obtained from MoEF 18th August 2010 |
| **/HYDROLOGY/** | • Hydrology study conducted for the project activity dated August 2008 (Part of the DPR)<br>• River Hydrology drawings |
| **/IRR/** | • Draft Internal Rate of Return work sheet<br>• Final Internal Rate of Return work sheet |
| **/IT/** | Income Tax Act , 1961 |
| **/LOAN/** | • Loan application letter from SLS to IREDA for 21 MW to 24 dated 07.09.2009<br>• Loan approval letter from IREDA dated 04.10.2010 |
| **/LSHC/** | • Extract of advertisement in Andhra Jyothi dated 22nd December 2009 |

| Reference | Document |
|---|---|
| | • Proof of Local stake holder consultation process conducted on 28th December2009<br>• Proof of public hearing held on 25th December 2007 with Andhra Pradesh State Pollution Control Board and the people in the surrounding areas of the project activity<br>• No Objection Certificate (NOC) from the Gram Panchayat of the local village on 26th October 2009.<br>• Minutes of the local stake holder meeting |
| **/LT/** | Proof of Life time of the project activity |
| **/MD/** | Management decision (Board Resolution) to project implementation dated 15.09.2008 |
| **/MOC/** | Modalities of Communications with UNFCCC 08/03/2011 |
| **/MNRE/** | • MNRE subsidy notification for new SHP projects up to 25 MW<br>• MNRE notification reg. environmental clearances dated 14.09.2006 |
| **/NEDCAP/** | Clearance to the project by Non-Conventional Energy Development Corporation of Andhra Pradesh dated on 30th September 2009 |
| **/CIVIL CON/** | Civil contract agreement dated 05.10.2009 |
| **/PLF/** | Documentary evidence of PLF in conformity with Annex 11, EB 48 |
| **/PO/** | • Purchase order copies which are signed with the suppliers<br>• Cost overrun certificate form SLS dated 14.09.2010 |
| **/PPA/** | Power Purchase Agreement signed with TATA power 11/02/2008 |
| **/RFB/** | Letter from technology supplier for the refurbishment cost dated 02/09/2009 |
| **/RBI/** | Weekly Statistical Supplement dated 12/09/2008 |
| **/SC/** | • Consent to Establish/Operate from Andhra Pradesh State Pollution Control Board (APSPCB) dated 27/01/2011<br>• Clearance from the Irrigation & CAD (PW: Reforms) Department for utilizing the water resources in the Andhra Pradesh state on 17th August 2009 |

| Reference | Document |
|---|---|
| **/TECSOL/** | Certificate from Tecsol Engineers Pvt limited for auxiliary consumption and transmission losses dated 16/09/2010 |
| **/TS/** | Technical Specification of the major equipments in the project activity |
| **/UN&DNA/** | Correspondence between UNFCCC, DNA and the project promoter regarding compliance with annex 22 of EB 49 dated 16th November 2009 |

**Table 7-2:** Background investigation and assessment documents

| Reference | Document |
|---|---|
| **/ACM2/** | ACM0002: Approved consolidated baseline and monitoring methodology ACM002 Version 12.1.0<br>" Consolidated baseline methodology for grid-connected electricity generation from renewable sources" |
| **/CPM/** | TÜV NORD JI / CDM CP Manual (incl. CP procedures and forms) |
| **/CDM-GT/** | Glossary of CDM terms- version 5 |
| **/GCP/** | UNFCCC: Guidelines for completing CDM-PDD and CDM-NM |
| **/IPCC-GP/** | IPCC Good Practice Guidance & Uncertainty Management in National Greenhouse Gas Inventories, 2000 |
| **/IPPC-RM/** | Revised 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Reference Manual |
| **/KP/** | Kyoto Protocol (1997) |
| **/MA/** | Decision 3/CMP. 1 (Marrakesh – Accords & Annex to decision (17/CP.7)) |
| /RE/ | Kaltschmitt, Martin, Wiese, Andreas, Streicher, Wolfgang (2007) Renewable Energy – Technology, Economics and Environment, Publisher: Springer Verlag, Berlin. |
| **/TA/** | Tool for the demonstration and assessment of additionality (Ver. 5.2). |
| **/TEF/** | • Tool to calculate the emission factor for an electricity system version 2 |

| Reference | Document |
|---|---|
| | • Tool to calculate project or leakage CO2 emissions from fossil fuel combustion |
| **/VVM/** | Validation and Verification Manual (Version 1.2, Annex 3; EB 51) |

**Table 7-3:** Websites used

| Reference | Link | Organisation |
|---|---|---|
| **/APERC/** | www.aperc.gov.in | Andhra Pradesh Electricity Regulatory Commission |
| **/cd4cdm/** | www.cd4cdm.org | UNEP Riso Centre |
| **/CERC** | http://cercind.gov.in/Current_reg.html | Central Electricity Regulatory Commission |
| **/ipcc/** | www.ipcc-nggip.iges.or.jp | IPCC publications |
| **/IT/** | www.incometaxindia.gov.in | Income Tax Act, 1961 |
| **/MNRE/** | www.mnre.gov.in | Ministry of New and Renewable Energy |
| **/RBI/** | www.rbi.org.in | Reserve Bank of India |
| **/unfccc/** | http://cdm.unfccc.int | UNFCCC |

**Table 7-4:** List of interviewed persons

| Reference | MoI[1] | | Name | Organisation / Function |
|---|---|---|---|---|
| **/IM01/** | V | ☒ Mr. ☐ Ms | S. Uma maheshwar | M/S SLS power corporation limited/GM |
| **/IM01/** | V | ☒ Mr. ☐ Ms. | Kumar.V | M/S SLS power corporation limited |
| **/IM02/** | V | ☒ Mr. ☐ Ms | Zaosh Elavia | Ecolutions Carbon (India) Pvt. Ltd. |

| Reference | MoI[1] | | Name | Organisation / Function |
|---|---|---|---|---|
| **/IM02/** | V | ☒ Mr.<br>☐ Ms | Srinivas T | Ecolutions Carbon (India) Pvt. Ltd. |

[1)] Means of Interview: (**T**elephone, **E**-Mail, **V**isit)

# ANNEX

**A1:** Validation Protocol

**A2:** Assessment of Baseline Identification

**A3:** Assessment of Financial Parameters

**A4:** Assessment of Barrier analysis

**A5:** Outcome of the GSCP

**A6:** Appointment certificates of the team members

# ANNEX 1: VALIDATION PROTOCOL

**Table A-1:** Requirements Checklist

| **Checklist Item**<br>(incl. guidance for the validation team) | **Validation Team Comments**<br>(justification and substantiation of information, data and evidences) | **Ref.** | **Draft Concl.** | **Final Concl.** |
|---|---|---|---|---|
| ***A. General Description of Project Activity*** | | | | |
| **A.1. Approval**<br>*The written approval of the parties involved is a mandatory requirement* | | | | |
| A.1.1. Has the project provided written approvals of all parties involved? (EB 55 Annex 1, § 44)<br>*Indicate whether a letter of approval has been received, with a clear reference to the supporting documentation.*<br>*Indicate whether this letter was provided to the DOE by the project participants or directly by the DNA* | *Description:*<br>PP has received HCA on 18/08/2010 from India DNA and. the same is submitted to the assessment team.<br>.<br>*Justification of evidences:* Evidence HCA dated 18/08/2010 has been submitted to the validation team and suffices to prove that the project provided written approvals of Host country India.<br><br>*Conclusion:* CAR A1 was raised as HCA was submitted at a later stage of validation. The HCA was checked and found | /IM01/ | ~~CAR A1~~ | OK |

| Checklist Item<br>(incl. guidance for the validation team) | Validation Team Comments<br>(justification and substantiation of information, data and evidences) | Ref. | Draft Concl. | Final Concl. |
|---|---|---|---|---|
| | acceptable, thus CAR A1 was closed. | | | |
| A.1.2. Are the approvals issued from orgainsations listed as DNAs on the UNFCCC CDM website?<br>(EB 55 Annex 1, §§ 44, 47, 48, 49 (b), 49 (c), 53)<br>*Indicate the means of validation employed to assess the authenticity, i.e. in case of doubt whether LoA has been verified with the DNA. Further describe which entity submitted the LoA for validation.* | *Description:* The organisation issuing the host country approval is listed as Indian DNA in the UNFCCC website.<br>*Justification of evidences:*<br>Evidence http://cdm.unfccc.int/DNA/index.html is checked by the assessment team and found the same to be correct.<br>*Conclusion:* The name of the organisation issuing the host country approval is same as listed in the UNFCCC website. Hence, Assessment team concludes that the approvals are authenticated and correct. | /IM01/ | ~~Pending CAR A1~~ | |
| A.1.3. Do the written approvals confim that the corresponding party is a Party to the Kyoto Protocol?<br>(EB 55 Annex 1, § 45(a)) | *Description:*<br>The written approval from the Indian DNA confirms that the corresponding party is a party to Kyoto protocol.<br>*Justification of evidences:*<br>The HCA dated 18/08/2010 from the Indian DNA is cross checked by the assessment team and found the same to be correct. The government of India has ratified the Kyoto Protocoll in August 2002.<br>*Conclusion:*<br>The written approval from Indian DNA confirms that the corresponding party is a party to the Kyoto protocol. | /IM01/ | ~~Pending CAR A1~~ | OK |

| **Checklist Item**<br>(incl. guidance for the validation team) | **Validation Team Comments**<br>(justification and substantiation of information, data and evidences) | **Ref.** | **Draft Concl.** | **Final Concl.** |
|---|---|---|---|---|
| A.1.4. Do the written approvals confim that the participation is voluntary?<br>(EB 55 Annex 1, § 45(b)) | *Description:*<br>The written approval from the Indian DNA confirms that the participation is voluntary.<br>*Justification of evidences:*<br>The HCA from Indian DNA is cross checked by the assessment team and found the same to be correct.<br>*Conclusion:*<br>The participation for Indian DNA is voluntary. | /HCA/ | ~~Pending CAR A1~~ | OK |
| A.1.5. Does the written approval from the host country confim that the project contributes to the sustainable development in the country?<br>(EB 55 Annex 1, § 45(c)) | *Description:*<br>The written approval from Indian DNA confirms that the project will contribute to sustainable development.<br>*Justification of evidences:*<br>The HCA from Indian DNA has been cross checked by the assessment team and found the same to be correct. However, CAR1 has been raised.<br>*Conclusion:*<br>The HCA received by MOEF (Host country DNA) confirms that the project contributes to the sustainable development. | /IM01/ | ~~Pending CAR A1~~ | OK |
| A.1.6. Do the written approvals refer to the precise project title in the PDD submitted for | *Description:* | /IM01/ | ~~Pending CAR~~ | OK |

| **Checklist Item**<br>(incl. guidance for the validation team) | **Validation Team Comments**<br>(justification and substantiation of information, data and evidences) | **Ref.** | **Draft Concl.** | **Final Concl.** |
|---|---|---|---|---|
| registration or an additional specification of the project activity, e.g. PDD version number?<br>(EB 55 Annex 1, §§ 45(d), 50) | The written approval from the Indian DNA refers to the precise project title. The same title is mentioned in the PDD submitted for validation to the DOE.<br>*Justification of evidences:*<br>The HCA for Indian DNA is cross checked by the assessment team and found that the project title mentioned in the PDD are correct.<br>*Conclusion:*<br>The project title mentioned in the PDD is same as it is mentioned in the HCA of Indian DNA. | | ~~A1~~ | |
| A.1.7. Are the written approvals unconditional with regard to A.1.3 to A.1.6?<br>(EB 55 Annex 1, § 46) | *Description:*<br>The written approval from Indian DNA is unconditional.<br>*Justification of evidences:*<br>The approval is cross checked and found correct with respect to unconditional statement.<br>*Conclusion:*<br>The written approval is unconditional. | /IM01/ | ~~Pending CAR A1~~ | OK |
| A.1.8. Is the information regarding the project participants listed in section A3 and in Annex 1 of the PDD internally consistent to each other?<br>(EB 55 Annex 1, § 51) | *Description:*<br>The project participant is M/S SLS Power Corporation Limited and is consistently mentioned in section A3 and Annex 1 of the PDD. | /PDD/ | OK | |

| **Checklist Item**<br>(incl. guidance for the validation team) | **Validation Team Comments**<br>(justification and substantiation of information, data and evidences) | **Ref.** | **Draft Concl.** | **Final Concl.** |
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| | *Justification of evidences:*<br>The PDD has been checked and the name of the project participant is consistent.<br>*Conclusion:*<br>The name of the project participant is consistent in the PDD. | | | |
| A.1.9. Are all project participants listed in the PDD approved at least by one Party involved?<br>(EB 55 Annex 1, § 51)<br>*Indicate whether the participation of the project participant(s) has been approved by a Party to the Kyoto Protocol.*<br>*Describe the means of validation employed to draw this conclusion.* | *Description:*<br>The project participant is M/S SLS Power Corporation Limited which is approved by Indian DNA, the host country involved for the project activity (i.e. MoEF)<br>*Justification of evidences:*<br>HCA has been checked and it is confirmed that the SLS Power Corporation Limited is approved by the DNA of India.*Conclusion:*<br>The project participants listed in the PDD is approved by the Indian DNA. | /IM01/<br>/HCA/ | ~~Pending CAR A1~~ | OK |
| A.1.10. Are any other project participants approved but not listed in the PDD?<br>(EB 55 Annex 1, § 52) | *Description:*<br>The project participant listed in the PDD is approved by the DNA of Non Annex-I countries. There is no other project participant envisaged at this stage of validation.<br>*Justification of evidences:*<br>The listed project participant is approved by Indian DNA | /IM01/<br>/HCA/ | ~~Pending CAR A1~~ | OK |

| Checklist Item (incl. guidance for the validation team) | Validation Team Comments (justification and substantiation of information, data and evidences) | Ref. | Draft Concl. | Final Concl. |
|---|---|---|---|---|
| | *Conclusion:*<br>No other project participant is involved at this stage of validation. | | | |
| A.1.11. Does the DoE have a direct contractual relationship with the PP?<br>(EB 55 Annex 1, § 51; EB 50 Annex 48, §§ 7–9)<br>*Check whether the PPs listed in the published PDD are still listed in the PDD going to be submitted to request for registration.* | *Description:*<br>The DOE has a direct contract with M/S SLS Power Corporation Limited.<br>*Justification of evidences:*<br>The contract with the DOE has been checked to confirm the same.<br>*Conclusion:*<br>The DOE has a direct contract with the project participant for providing the CDM Validation service. | /DOE-CON/ | OK | OK |
| **A.2. Contribution to Sustainable Development**<br>*The project's contribution to sustainable development is assessed.* | | | | |
| A.2.1. Has the host country confirmed that the project assists it in achieving sustainable development?<br>(EB 55 Annex 1, §§ 125–127)<br>*Contains a statement confirming whether the letter of* | *Description:*<br>The host country approval confirms that the project will assists in achieving sustainable development.<br>*Justification of evidences:* | /PDD/, /IM01/<br>/HCA/ | ~~Pending CAR A1~~ | OK |

| Checklist Item<br>(incl. guidance for the validation team) | Validation Team Comments<br>(justification and substantiation of information, data and evidences) | Ref. | Draft Concl. | Final Concl. |
|---|---|---|---|---|
| *approval by the DNA of the host party confirmed the contribution of the project to the sustainable development of the Host Party.* | Evidence HCA dated 18/08/2010 has been submitted and suffices to prove that the project contributes to the sustainable development in the country.<br>*Conclusion:*<br>The host country approval proves that the project will assist in achieving sustainable development. | | | |
| A.2.2. Will the project create other environmental or social benefits than GHG emission reductions?<br>(EB 55 Annex 1, §§ 125–127)<br>*Describe the other positive aspects not related to GHG emission reduction on the environment.* | *Description:*<br>The project will assist in social and economical development of the local area in addition to reduction of GHGs.<br>*Justification of evidences:*<br>During the site visit and subsequent interview with the client, it was found no other environmental benefits envisaged at this stage of validation. However, employment opportunities to the local villagers and other stake holders directly /indirectly will be created by the project.<br>*Conclusion:*<br>Project activity will lead to many employment opportunities and economic development of the nearby villages in the region. | /PDD/, /IM01/<br>/DPR/ | ~~Pending CAR A1~~ | OK |

| Checklist Item<br>(incl. guidance for the validation team) | Validation Team Comments<br>(justification and substantiation of information, data and evidences) | Ref. | Draft Concl. | Final Concl. |
|---|---|---|---|---|
| **A.3. PDD editorial aspects**<br>*The PDD used as a basis for validation shall be prepared in accordance with the latest template and guidance from the CDM Executive Board available on the UNFCCC CDM website.* | | | | |
| A.3.1. Has the latest version of the PDD form been applied?<br>(EB 55 Annex 1, § 55) | *Description:*<br>The PDD follows version 3.1 which is not the version available at UNFCCC website. CAR A2 and CAR A3 were raised.<br>*Justification of evidences:*<br>http://cdm.unfccc.int/Reference/PDDs_Forms/PDDs/index.html<br>*Conclusion:*<br>PDD has been revised appropriately, CAR A2 and CAR A3 have been closed. | /UNFCCC/<br>/PDD/ | ~~CAR A2~~<br>~~And CAR A3~~ | OK |
| A.3.2. Has the PDD been duly filled in accordance with the latest guidance(s)?<br>(EB 55 Annex 1, §§ 56–57) | *Description:* The PDD has been filled as per the latest guideline version 7 available on the UNFCCC website. However, the following sections are incomplete:<br>Section A.2 & Section A.4.3 of the PDD is incomplete to following<br>• The Scenario existing prior to the start of the implementation of the project activity | /UNFCCC/ | ~~CAR A2~~<br>~~CAR A3~~ | OK |

| Checklist Item<br>(incl. guidance for the validation team) | Validation Team Comments<br>(justification and substantiation of information, data and evidences) | Ref. | Draft Concl. | Final Concl. |
|---|---|---|---|---|
| | • The project scenario, including a summary of the scope of activities/measures, a list of the equipment(s) and systems that will be installed with technical details that are being implementation.<br>• Section A.4.4 of the PDD indicates the seven year renewable crediting period while PP has chosen fixed crediting period<br>*Justification of evidences:*<br>The latest version of CDM PDD filling guidelines has been cross-checked by the Validation Team and found incomplete in the above aspects.<br>*Conclusion:* PDD has been revised appropriately and CAR A2 and CAR A3 have been closed. | | | |
| **A.4. Technology to be employed**<br>*Validation of project technology focuses on the project engineering, choice of technology and competence/ maintenance needs. The DOE should ensure that environmentally safe and sound technology and know-how is used.* | | | 7.1.1 | 7.1.2 |
| A.4.1. Does the PDD contain a clear, accurate and complete project description?<br>(EB 55 Annex 1, §§ 58–59)<br>*The PDD shall contain a clear description of the project activity which provides the reader with a clear understanding* | *Description:*<br>The PDD contain clear and accurate description of the project activity. The project is a Renewable Hydro project with 24 MW Capacity. The project activity involves installation of Six | /TS/, /VVM/, /DPR/ | OK | OK |

| **Checklist Item**<br>(incl. guidance for the validation team) | **Validation Team Comments**<br>(justification and substantiation of information, data and evidences) | **Ref.** | **Draft Concl.** | **Final Concl.** |
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| *of the precise nature of the project activity and the technical aspects of its implementation.*<br>*Pl. consider esp.* chapters *A.2, A.4.2 and A.4.3 (in case of LSC PDD) for assessment.*<br>*Describe the process undertaken to validate the accuracy and completeness of the project description.*<br>*Contain the DOE's opinion on the accuracy and completeness of the project description.* | Horizontal Pit type full Kaplan turbine & generating of 4 MW each to generate 24 MW Power which would be supply electricity to Sothern regional grid of India.<br>*Justification of evidences:*<br>The technical description of the project is being cross-checked by the assessment team.<br>*Conclusion:*<br>The project as described in the PDD is accurate. | | | |
| A.4.2. Is this description in accordance with the real situation or (in case of greenfield projects) is it most likely that the project will be implemented acc to the project description? | *Description:*<br>The project is a green field project and is under implementation.<br>*Justification of evidences:*<br>The technical description of the project is being cross-checked by the assessment team. The implementation is as per the DPR and the statutory clearance has been received..<br>*Conclusion:*<br>By means of document review and site visit, it can be concluded that the project will most likely be implemented as described in the PDD. | /TS/, /VVM/, /DPR/ | OK | OK |

| **Checklist Item**<br>(incl. guidance for the validation team) | **Validation Team Comments**<br>(justification and substantiation of information, data and evidences) | **Ref.** | **Draft Concl.** | **Final Concl.** |
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| A.4.3. In case the project involves alteration of the existing installation or process, is a clear description available regarding the differences between the project and the pre-project situation?<br><br>(EB 55 Annex 1, §§ 63–64)<br>*Describe the steps taken to validate this issue.* | *Description:*<br>The project is a green field project and does not involve any alteration.<br><br>*Justification of evidences:*<br>The technical description of the project is being cross-checked by the assessment team also it was confirmed during the site visit that the project is still under construction.<br>*Conclusion:*<br>The project is a green field project. | /DPR/,<br>/SV/ | OK | OK |
| A.4.4. Does the project design engineering reflect current good practices?<br>*Consider the equipment specifications, literature (e.g. EU BREF papers) and professional experiences. Describe the process undertaken to assess the engineering.* | *Description:*<br>The project involves setting up a 24 MW hydro power plant. The technology is proven; however the installation of such large scale hydropower plant by a private entity in the region is a new initiative. The technology includes installation of 6 units of 4 MW each Horizontal Pit type Kaplan turbine totalling 24 MW run of the river power plant. Being a run of the river with 24 MW capacities reflects the good practice followed by the project participants.<br><br>*Justification of evidences:*<br>DOE sectoral expertise is sufficient enough to prove that the | /DPR/,<br>/TS/<br>/PDD/ | OK | OK |

| **Checklist Item**<br>(incl. guidance for the validation team) | **Validation Team Comments**<br>(justification and substantiation of information, data and evidences) | **Ref.** | **Draft Concl.** | **Final Concl.** |
|---|---|---|---|---|
| | project activity project design engineering reflects current good practices which is in line with VVM and is acceptable to the validation team.<br><br>*Conclusion:*<br>The project design follows the current good practice scenario. | | | |
| A.4.5. Does the project use state of the art technology or would the technology result in a significantly better performance than any commonly used technologies in the host country?<br>*Describe the process undertaken to assess the state of the art technology.* | *Description:*<br>The project is setting up a run of the river hydro plant of 24 MW capacities, while the host country has a dominant fossil fuel based electricity generation. Thus the project uses a technology not commonly used in the host country.<br>*Justification of evidences:*<br>DOE sectoral expertise is sufficient enough to prove that the project activity project design engineering reflects current good practices which is in line with VVM and is acceptable to the validation team.<br>*Conclusion:*<br>The project technology results in better performance than commonly used technology in the host country. | /DPR/<br>/PDD/ | OK | OK |
| A.4.6. Does the project make provisions for meeting training and maintenance needs?<br>*Describe the process undertaken to assess the* | *Description:*<br>The project is under construction, however the training requirements to be undertaken during the erection, | /IM01/ | OK | OK |

| Checklist Item (incl. guidance for the validation team) | Validation Team Comments (justification and substantiation of information, data and evidences) | Ref. | Draft Concl. | Final Concl. |
|---|---|---|---|---|
| *maintenance and training needs.* | construction and operation has been detailed in the Civil contractor and proper provisions are provided for the same.<br>*Justification of evidences:*<br>During the site visit and interview with the project participant it was found that the project activity is still in the implementation stage and thus the training requirements are not identified by the PP at this stage but the compliance of the same should be checked during the verification of the project activity w.r.t PDD<br>*Conclusion:*<br>A provision for training has been provided. | | | |
| **A.5. Small scale project activity**<br>*It is assessed whether the project qualifies as small-scale CDM project activity* | | | | |
| A.5.1. Does the project qualify as a small scale CDM project activity as defined in decision 4 / CMP.1 annex II?<br>(EB 55 Annex 1, §§ 135–136 (a)) | *Description:*<br>The project is a Large scale project activity, thus the section is not applicable.<br>*Justification of evidences:*<br>*Conclusion:* | NA | NA | NA |

| **Checklist Item**<br>(incl. guidance for the validation team) | **Validation Team Comments**<br>(justification and substantiation of information, data and evidences) | **Ref.** | **Draft Concl.** | **Final Concl.** |
|---|---|---|---|---|
| A.5.2. Does the project apply one of the approved small scale categories and any methodology and tool referred therein?<br>(EB 55 Annex 1, § 136 (b))<br>*Check, if applicable the expiry dates of the applied methodology. Further, take into consideration the general guidance to the methodologies[27], which provide guidance on equipment capacity, equipment performance, sampling and other monitoring related issues.* | *Description:*<br>The project is a Large scale project activity, thus the section is not applicable.<br>*Justification of evidences:*<br>*Conclusion:* | NA | NA | NA |
| A.5.3. Is the small scale project activity not a debundled component of a larger project activity?<br>(EB 55 Annex 1, § 136 (c))<br>*Describe the steps taken to validate this issue. Pl refer to the Compendium of guidance on debundling (EB ~~36, Annex 27~~ 54, Annex 13).* | *Description:*<br>The project is a Large scale project activity, thus the section is not applicable.<br>*Justification of evidences:*<br>*Conclusion:* | NA | NA | NA |
| A.5.4. Is an assessment of the environmental impacts of the proposed SSC CDM project activity required by the host Party?<br>(EB 55 Annex 1, § 136 (d)) | *Description:*<br>The project is a Large scale project activity, thus the section is not applicable.<br>*Justification of evidences:* | NA | NA | NA |

[27] http://cdm.unfccc.int/methodologies/SSCmethodologies/approved.html

| Checklist Item<br>(incl. guidance for the validation team) | Validation Team Comments<br>(justification and substantiation of information, data and evidences) | Ref. | Draft Concl. | Final Concl. |
|---|---|---|---|---|
| | *Conclusion:* | | | |
| ***B. Project Baseline, Additionality and Monitoring Plan*** | | | | |
| **B.1. Application of the Methodology** | | | | |
| B.1.1. Does the project apply an approved and applicable CDM methodology and a valid version thereof?<br>(EB 55 Annex 1, § 65)<br>*Describe the steps taken to validate this issue.* | *Description:*<br>The project applies ACM0002 version 12.1.0 which is the valid and latest version during the web-hosting period.<br><br>*Justification of evidences:*<br>Evidence http://cdm.unfccc.int/UserManagement/FileStorage/HGY3TLRFPQVM016WA4I7XCZD92KE5S has been crosschecked by the validation team and found that the project applies an approved and applicable CDM methodology and a valid version during the global stake holder consultation process which is acceptable to validation team.<br><br>*Conclusion:*<br>The project applies the approved and applicable methodology | /UNFCCC/<br>/PDD/ | OK | OK |

| Checklist Item<br>(incl. guidance for the validation team) | Validation Team Comments<br>(justification and substantiation of information, data and evidences) | Ref. | Draft Concl. | Final Concl. |
|---|---|---|---|---|
| | ACM0002 version 12.1.0 which is valid. | | | |
| B.1.2. Is the applied CDM methodology identical with the version available on the UNFCCC website?<br>(EB 55 Annex 1, §§ 65, 70)<br>*Describe the steps taken to validate this issue.* | *Description:*<br>The project applies ACM0002 version12.1.0 which is valid and available on UNFCCC web site.<br>*Justification of evidences:*<br>Evidence<br>http://cdm.unfccc.int/methodologies/DB/TZFK7NUO5DYE5AI2PDMLG65BFIWMG5/view.html is being cross checked by the assessment team and found that project applies an approved and applicable CDM methodology and a valid version during the global stake holder consultation process which is acceptable to the validation team.<br>*Conclusion:*<br>The project uses a version which is identical to the current available version on UNFCCC website. | /UNFCCC/<br>/PDD/ | OK | OK |
| B.1.3. Are all applicability criteria in the methodology, the applied tools or any other methodology component referred to therein fulfilled?<br>(EB 55 Annex 1, §§ 66(a)–(b), 68, 71, 76)<br>*Describe for each applicability criterion listed in the selected approved methodology the steps taken to assess the* | *Description:*<br>Criteria: This methodology is applicable to grid connected renewable power generation project activities that (a) install a new Power plant at a site where no renewable power plant was operated prior to the implementation of the project activity (Greenfield plant); (b) involve a capacity addition; (c) involve a retrofit of (an) existing plant(s); or (d) involve a | /ACM002/<br>/PDD/<br>/IM01/ | OK | OK |

| Checklist Item<br>(incl. guidance for the validation team) | Validation Team Comments<br>(justification and substantiation of information, data and evidences) | Ref. | Draft Concl. | Final Concl. |
|---|---|---|---|---|
| *information contained in the PDD.* | replacement of (an) existing plant(s).<br><br>Assessment: The project activity is green field project and there were not any renewable power plants operated prior to the project activity.<br><br>Criteria: The project activity is the installation or modification/retrofit of a power plant/unit of one of the following types: hydro power plant/unit (either with a run-of-river reservoir or an accumulation reservoir), wind power plant/unit, geothermal power plant/unit, solar power plant/unit, wave power plant/unit or tidal power plant/unit.<br><br>Assessment: The project activity is the green field run of the river hydro power plant.<br><br>Criteria: In the case of capacity additions, retrofits or replacements (except for wind, solar, wave or tidal power capacity addition projects which use Option 2: on page 10 to calculate the parameter EGPJ,y): the existing plant started commercial operation prior to the start of a minimum historical reference period of five years, used for the calculation of baseline emissions and defined in the baseline emission section, and no capacity expansion or retrofit of the plant has been undertaken between the start of this minimum historical reference period and the implementation of the project activity. | | | |

| Checklist Item<br>(incl. guidance for the validation team) | Validation Team Comments<br>(justification and substantiation of information, data and evidences) | Ref. | Draft Concl. | Final Concl. |
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| | Assessment: This hydro power plant is a green field project and there is not any capacity addition, retrofit or replacement project.<br><br>Criteria: In case of hydro power plants:<br>The project activity is implemented in an existing reservoir, with no change in the volume of reservoir.<br>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.<br>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.<br>Assessment: Project activity is new run of river reservoir and the power density is 192 W/m2 greater than 4 W/m2<br>*Justification of evidences:*<br>The methodology ACM0002 version 12.1.0 is cross checked by the assessment team and found that PDD is in line with the requirements of the methodology.<br>*Conclusion:* | | | |

| Checklist Item<br>(incl. guidance for the validation team) | Validation Team Comments<br>(justification and substantiation of information, data and evidences) | Ref. | Draft Concl. | Final Concl. |
|---|---|---|---|---|
| | The project meets the applicability criteria of the methodology | | | |
| B.1.4. In case one or more applicability criteria have not been met, has the validation team requested clarification to, revision of or deviation from the methodology in accordance with the latest guidelines?<br>(EB 55 Annex 1, §§ 72–75) | *Description:* Project activity meets all the applicability criteria of the approved methodology.<br><br>*Justification of evidences:*<br>The methodology ACM0002 version 12.1.0 is cross checked by the assessment team and found that PDD is in line with the requirements of the methodology.<br><br>*Conclusion:*<br>The project meets the applicability criteria of the methodology | /ACM002 /<br>/PDD/ | OK | OK |
| B.1.5. Is the project in accordance with every other stipulation or requirement mentioned in all sections of the methodology and in guidances for approved methodologies provided by the CDM EB? | *Description:* All the other requirement of the methodology is addressed in the revised PDD. However, CAR B1 has been raised for the applicable requirement of the project activity under ACM0002<br>*Justification of evidences:* The methodology ACM0002 is | /ACM002 /<br>/PDD/ | ~~CAR B1~~ | OK |

| Checklist Item<br>(incl. guidance for the validation team) | Validation Team Comments<br>(justification and substantiation of information, data and evidences) | Ref. | Draft Concl. | Final Concl. |
|---|---|---|---|---|
| (EB 55 Annex 1, § 69, 71)<br>*Describe the steps taken to check whether the proposed project activity meets all the other possible stipulations and /or limitations mentioned in all sections of the approved methodology selected.* | cross checked by the assessment team and found that the every other stipulation or requirement mentioned in all sections of the methodology is addressed in the PDD.<br><br>*Conclusion:* All the requirement of the stipulated methodology is mentioned in the PDD. | | | |
| **B.2. Project Boundaries**<br>*Project Boundaries are the limits and borders defining the GHG emission reduction project* | | | | |
| B.2.1. Are the project's spatial boundaries (geographical) clearly defined?<br>(EB 55 Annex 1, §§ 67(a), 78–80)<br>*Provide information on how the validation of the geographical boundary has been performed either based on reviewed documented evidence or by describing what was observed/viewed during a site visit.* | *Description:*<br>The project boundary includes the power plant and other plants connected to the grid.<br><br>*Justification of evidences:*<br>ACM0002 version 12.1.0 The project boundary is described as per the methodology ACM0002 version 12.1.0 and considers all the power plants identified as per the Tool to calculate the emission factor for an electricity system<br>*Conclusion:*<br>The project boundary is described as per the methodology. | /IM01/<br>/SV/ | OK | OK |
| B.2.2. Are all sources and GHGs included in the project boundary as required in the applied | *Description:* | /ACM000 | OK | OK |

| **Checklist Item**<br>(incl. guidance for the validation team) | **Validation Team Comments**<br>(justification and substantiation of information, data and evidences) | **Ref.** | **Draft Concl.** | **Final Concl.** |
|---|---|---|---|---|
| methodology?<br>(EB 55 Annex 1, §§ 67(a), 78–80)<br>*Provide information on how the validation of the GHGs and sources has been performed either based on reviewed documented evidence or by describing what was observed/viewed during a site visit.* | The project activity considered only the baseline $CO_2$ emission due to baseline electricity generation. The project emission are considered as per the methodology<br>Justification of evidences:<br>The methodology ACM0002and VVM was checked by the assessment team and found that all sources and GHGs are included in the PDD.<br>Conclusion: All the sources and GHGs are included in the project as per the methodology requirement. | 2/<br>/VVM/ | | |
| B.2.3. In case the methodology allows to choose whether a source and/or gas is to be included, is the choice sufficiently explained and justified?<br>(EB 55 Annex 1, §§ 67(a), 78–80)<br>*Confirm if the justification provided by the PPs is reasonable, based on assessment of supporting documented evidence provided by the PPs or by onsite observations.* | *Description:*<br>The methodology does not provide for selection of gas/source to be included in the project activity.<br>*Justification of evidences:*<br>The methodology ACM0002 was checked by the assessment team.<br>*Conclusion:*<br>GHG emission due to DG sets needs to be considered in the Project boundary. | /ACM002<br>/ | OK | OK |

| Checklist Item<br>(incl. guidance for the validation team) | Validation Team Comments<br>(justification and substantiation of information, data and evidences) | Ref. | Draft Concl. | Final Concl. |
|---|---|---|---|---|
| **B.3. Baseline Identification**<br>*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.* | | | | |
| B.3.1. What possible baseline scenarios have been considered?<br>(EB 55 Annex 1, §§ 67(b), 83)<br>*Fill in all alternatives in table A-2.* | *Description:*<br>As per the methodology ACM0002, for greenfield projects the baseline should be calculated as per the "Tool to calculate the emission factor for an electricity system" the same has been followed.<br>The baseline scenarios considered are;<br>• The proposed project activity without CDM<br>• Continuation of the current situation<br>• Construction of fossil fuel based power plant with same capacity<br>• Construction of a power plant using another renewable energy resource<br>Furthermore, CAR B2 was raised due to the course of validation<br>*Justification of evidences:* | /ACM0002/,<br>/APERC/<br>/PDD/<br>/MNRE/ | ~~CAR B2~~ | OK |

| **Checklist Item**<br>(incl. guidance for the validation team) | **Validation Team Comments**<br>(justification and substantiation of information, data and evidences) | **Ref.** | **Draft Concl.** | **Final Concl.** |
|---|---|---|---|---|
| | The methodology ACM0002 and Tool to calculate emission factor of an electricity system were checked by the assessment team and found that the baseline scenario is not as per the same. Hence, the CAR B2 was raised due to the validation process.<br>*Conclusion:*<br>The most suitable baseline scenario is identified as the continuation of the current situation i.e. to use all power generation equipment that was already in use prior to the implementation of the project activity and undertaking business as usual maintenance. The additional power generated under the project would be generated in existing and new grid-connected power plants in the electricity system. | | | |
| B.3.2. Is the list of alternatives complete?<br>(EB 55 Annex 1, §§ 67(b), 83)<br>*Describe how it was validated that all alternatives are plausible and no plausible alternative is excluded from the consideration* | ☒ All plausible alternative scenarios listed in the approved methodology have been considered. In the course of document review and site visit, it has been validated that no other alternatives which supply comparable outputs and / or services are to be taken into consideration. Thus no plausible scenario has been omitted.<br>☐ The following alternative scenarios/options have been omitted. Corresponding CAR(s)/CL(s) has /have been issued. | /ACM0002/,<br>/APERC/<br>/PDD/<br>/MNRE/ | OK | OK |
| B.3.3. What has been identified as the baseline scenario? | *Description:*<br>The continuation of the current situation in the grid has been considered as the baseline scenario. The same is calculated | /ACM0002/, | OK | OK |

| **Checklist Item**<br>(incl. guidance for the validation team) | **Validation Team Comments**<br>(justification and substantiation of information, data and evidences) | **Ref.** | **Draft Concl.** | **Final Concl.** |
|---|---|---|---|---|
| (EB 55 Annex 1, §§ 81–82, 86)<br>*Describe the chosen BL scenario, taking into consideration the technology that would be employed and / or the activities that would take place in the absence of the proposed CDM project activity.* | as per the "Tool to calculate the emission factor for an electricity system".<br>*Justification of evidences:*<br>The methodology ACM0002 and Tool to calculate emission factor of an electricity system were checked by the assessment team and found that the baseline scenario is as per the same<br>*Conclusion:*<br>The baseline is the continuation of electricity generation for the connected southern regional grid of India at the current rate of emissions. | /APERC/<br>/PDD/<br>/MNRE/ | | |
| B.3.4. Has the baseline scenario been determined according to the methodology?<br>(EB 55 Annex 1, §§ 82, 87(e))<br>*Describe how it is validated that the identification of the most plausible baseline scenario is carried out in accordance with the applied methodology and applied methodological tools. Please refer to table A-2.* | For details of the assessment regarding the evaluation of the baseline scenario pl. refer to table A-2.<br>☐ The determination has been carried out as per the procedure contained in the applied methodology.<br>☒ The following CARs / CLs have been identified with respect to the selection of the baseline scenario:<br>CAR B1 has been raised and closed successfully. | /ACM0002/,<br>/APERC/<br>/PDD/<br>/MNRE/ | ~~CAR B 1~~ | OK |
| B.3.5. Has any plausible alternative scenario been excluded?<br>(EB 55 Annex 1, § 83)<br>*Describe how it is validated that no plausible alternative scenario has been excluded.* | For details of the assessment regarding the evaluation of the baseline scenario pl. refer to table A-2.<br>☒ No plausible baseline scenario has been excluded.<br>☐ The following plausible baseline scenarios have been excluded though no adequate justification has been provided for elimination. The following CARs / CLs have been issued: | /ACM0002/,<br>/APERC/<br>/PDD/<br>/MNRE/ | OK | OK |

| **Checklist Item**<br>(incl. guidance for the validation team) | **Validation Team Comments**<br>(justification and substantiation of information, data and evidences) | **Ref.** | **Draft Concl.** | **Final Concl.** |
|---|---|---|---|---|
| | | | | |
| B.3.6. Is the identified baseline scenario reasonable and has the baseline scenario been determined using conservative assumptions where possible, including relevant references and sources?<br>(EB 55 Annex 1, §§ 84–86(a)–(c))<br>*Describe whether the choice of the identified baseline scenario is reasonable by validating the key assumptions, calculations and rationales used in the PDD. Describe whether these are listed, relevant and conservatively interpreted in the PDD.* | ☒ The baseline scenario is reasonable and has been determined using conservative assumptions where possible. Please refer to comments in table A-2 and sections B.3.2 to B.3.5 above.<br>☐ The following CARs / CLs have been issued because assumptions used in the baseline determination have been assessed to be not conservative. | /ACM0002/,<br>/APERC/<br>/PDD/<br>/MNRE/ | OK | OK |
| B.3.7. Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies, macro-economic trends and political aspirations?<br>(EB 55 Annex 1, §§ 85, 87(d))<br>*Describe whether the PP has shown that all relevant policies and circumstances have been identified and correctly considered in the PDD in accordance with the guidance by the Board. Pl. consider the guidance EB 22 annex 3 (regarding E+ and E- policies).* | *Description:*<br>PDD does not describe the National policies and circumstances relevant to the baseline of the proposed project as per the para 84 of VVM version 1.1<br><br>*Justification of evidences:*<br>The contents of the EB meeting 22 annex 3 and EB55 para 27 are cross checked.<br><br>*Conclusion:*<br>EB55 Para 27 gives an option not to considered national and sectoral policies to demonstrate additionality. However, PP | /EB meeting 22 annex 3/<br>/EB meeting 55/<br>/PDD/ | ~~CAR B3~~ | OK |

| **Checklist Item**<br>(incl. guidance for the validation team) | **Validation Team Comments**<br>(justification and substantiation of information, data and evidences) | **Ref.** | **Draft Concl.** | **Final Concl.** |
|---|---|---|---|---|
| | has not considered the Relevant National and sectoral policies in the baseline scenario of the proposed project. Hence, CAR is closed. | | | |
| B.3.8. Is the baseline scenario determination compatible with the available data and are all literature and sources clearly referenced?<br><br>(EB 55 Annex 1, § 87(a)–(c))<br>*Describe whether the documents and sources referred to in the PDD are correctly quoted and clearly referenced.* | *Description:*<br><br>Baseline scenario is not described transparently and the reference and documentation to substantiate the baseline scenario need to be provided in section B.4 of the PDD. Furthermore, PDD does not describe any national and sectoral policies as per the para 84 of the VVM version 1.1.<br><br>*Justification of evidences:*<br><br>The data and parameters used for development of baseline scenario in Section B.4 of the PDD has been crosschecked with reference provided by PP b.<br><br>*Conclusion:* Section B.4 of the PDD has been crosschecked by the methodology and found that it is in line with the methodology. However, CAR B2 and B3 have been raised. | /ACM0002/<br><br>/VVM/<br><br>/PDD/ | ~~Pending CAR B2 and CAR B3~~ | OK |

| Checklist Item<br>(incl. guidance for the validation team) | Validation Team Comments<br>(justification and substantiation of information, data and evidences) | Ref. | Draft Concl. | Final Concl. |
|---|---|---|---|---|
| B.3.9. Does the PDD contain a *verifiable* description of the identified baseline scenario, including a description of the technology that would be employed and/or the activities that would take place in the absence of the proposed CDM project activity.<br>(EB 55 Annex 1, § 86) | *Description:* The baseline scenario identification has been carried out in line with the methodology Baseline scenario is not described transparently and the reference and documentation to substantiate the baseline scenario need to be provided in section B.4 of the PDD. Furthermore, PDD does not describeany national and sectoral policies as per the para 84 of the VVM version 1.1. *Justification of evidences:* The data used in development of the baseline has been substantiated with the supporting reference wherever applicable. Furthermore, the website addresses are also been given for ready reference. The data used for baseline development was verified and it is transparent. *Conclusion:* Section B.4 of the PDD has been crosschecked by the methodology and found that it contains a *verifiable* description of the identified baseline scenario, | /ACM0002/<br>/VVM/ | ~~Pending CAR B2 and CAR B3~~ | OK |
| **B.4. Additionality Determination**<br>*The assessment of additionality will be validated with focus on whether the project itself is not a likely baseline scenario.* | | | | |
| **B.4.1. Methodology** | | | | |
| B.4.1.1. Does the PDD describe how the project is additional and does the additionality justification follow the requirements of the applied methodology and/or | *Description:*<br>The project follows the investment analysis to prove the additionality and follows the requirement of the Additionality tool. | /TA/ | OK | OK |

| Checklist Item (incl. guidance for the validation team) | Validation Team Comments (justification and substantiation of information, data and evidences) | Ref. | Draft Concl. | Final Concl. |
|---|---|---|---|---|
| methodological tools?<br><br>(EB 55 Annex 1, §§ 67(d), 94–95)<br>*Describe how it is validated that additionality justification is carried out in accordance with the applied methodology and/or applied methodological tools. Further focus your assessment on the reliability and credibility of data, rationales and assumptions, justifications and documentations provided by the PP.* | *Justification of evidences:*<br>"Tool for the demonstration and assessment of additionality" was applied and is acceptable.<br><br>*Conclusion:*<br>PDD describes how the project is additional and follows the methodological tools | | | |
| **B.4.2. Consideration of CDM before project start** | | | | |
| B.4.2.1. Is the project starting date reported in accordance with the CDM glossary of terms?<br><br>(EB 55 Annex 1, § 104(a))<br>*Assess why the chosen starting date can be considered as the earliest date at which either the implementation or construction or real action of a project has begun or will begin.*<br><br>*Check that no other activities related to the project that happened before the identified start date can be considered as start date. In this context please also take into consideration infrastructural expenses if they are relevant (in terms of costs and importance for the project implementation) in the specific context of the project activity.* | *Description:*<br>The starting date for the project is 05/10/2009 when the order for Civil construction was place and is in accordance with the CDM glossary of terms.<br><br>*Justification of evidences:*<br>The work order for the civil construction and the CDM glossary of terms have been checked.<br><br>*Conclusion:*<br>The start date of the project activity is as per the CDM glossary of Terms version 05 and assessment team found it correct. | / CIVIL-CON/<br>/CDM-GT/ | OK | OK |
| B.4.2.2. In case the project start date is on or after 2nd August 2008 has the PP informed the | *Description:* | /EB49, Annex22/ | OK | OK |

| Checklist Item (incl. guidance for the validation team) | Validation Team Comments (justification and substantiation of information, data and evidences) | Ref. | Draft Concl. | Final Concl. |
|---|---|---|---|---|
| DNA and UNFCCC about the intension to seek CDM status?<br><br>(EB 55 Annex 1, §§ 99–101)<br>*Describe whether such a notification has been provided by the project participants within six months of the project activity start date; if NOT it shall be determined that the CDM was not seriously considered.* | The starting date of the project activity is after 2nd August 2008 and thus PP has informed to DNA and UNFCCC about the intension to seek CDM status.<br><br>*Justification of evidences:*<br><br>The guideline about prior CDM consideration version 03 has been cross checked by the assessment team and found that as the project activity start date is after 2nd August 2008 and thus PP has informed to DNA and UNFCCC about the intension to seek CDM status.<br><br>*Conclusion:*<br><br>Starting date of the project activity is after 2nd August 2008, thus PP has informed DNA and UNFCCC. | | | |
| B.4.2.3. In case the project start date is before commencing of validation and 2nd August 2008, was the incentive from the CDM seriously considered and are details given in the PDD?<br><br>(EB 55 Annex 1, §§ 100, 102)<br>*Describe whether the evidence to support such consideration is adequately and transparently described in the PDD.* | *Description:*<br><br>The starting date of the project activity is after 2nd August 2008 and thus PP has informed to DNA and UNFCCC about the intension to seek CDM status.<br><br>*Justification of evidences:*<br><br>Serious CDM consideration version 03 and modalities and communication with UNFCCC has been cross checked by the assessment team and found that the project activity start date is after 2nd August 2008. *Conclusion:*<br><br>Starting date of the project activity is after 2nd August 2008, thus PP has informed DNA and UNFCCC. | /UNFCCC/<br><br>/EB49, Annex22/ | OK | OK |

| **Checklist Item**<br>(incl. guidance for the validation team) | **Validation Team Comments**<br>(justification and substantiation of information, data and evidences) | **Ref.** | **Draft Concl.** | **Final Concl.** |
|---|---|---|---|---|
| B.4.2.4. How and when was the decision to proceed with the project taken?<br>*Describe the steps taken to validate the starting date.* | *Description:* The Board Resolution on taking the project forward under CDM is taken on 15th September 2008.<br><br>*Justification of evidences:*<br>The board resolution note is cross checked by the assessment team which mentions about the decision to go ahead with the project with CDM as a decisive factor.<br><br>*Conclusion:* The date is before the start date of the project activity and checked by the validation team with the Management decision. | /MD/ | OK | OK |
| B.4.2.5. Is the project start date consistent with the available evidences?<br>(EB 55 Annex 1, § 102)<br>*Describe the evidence assessed regarding the prior consideration of the CDM (if necessary). Describe whether the evidence to support such consideration is adequately and transparently described in the PDD.* | *Description:*<br>The starting date of the project activity is based on the order released for Civil construction on 5th October 2009 and as per the CDM Glossary of terms.<br>*Justification of evidences:*<br>The start date is as per the CDM glossary of terms<br>*Conclusion:*<br>The starting date of the project activity is as per the order released for civil construction and is acceptable. | /CDM-GT/ | OK | OK |
| B.4.2.6. Was the decision to proceed with the project taken by a person which has the authority to do so? | *Description:*<br>The decision to proceed for the project was taken by the board of Directors of company and they have the authority for | /MD/ | OK | |

| **Checklist Item**<br>(incl. guidance for the validation team) | **Validation Team Comments**<br>(justification and substantiation of information, data and evidences) | **Ref.** | **Draft Concl.** | **Final Concl.** |
|---|---|---|---|---|
| (EB 55 Annex 1, § 102(a)<br>*Describe the steps taken to validate this issue.* | the same.<br><br>*Justification of evidences:*<br>Board note was checked and found acceptable.<br>*Conclusion:*<br>The decision to proceed by the project was taken by the board of Directors who have authority to take decision. | | | |
| B.4.2.7. How was the CDM involved in the decision making process?<br>(EB 55 Annex 1, § 102)<br>*Describe why CDM was a decisive factor in the decision making process.* | *Description:*<br>CDM revenues were considered in the meeting of Boards of directors prior to the start of the project activity. CDM revenue will improve the return from the project activity without which the project is not financially attractive.<br>*Justification of evidences:*<br>The Board note and minutes of meeting were crosschecked by the validation team.<br>*Conclusion:*<br>By means of document review it can be confirmed that CDM revenues were involved in the decision making process. | /MD/<br>/VVM/ | OK | OK |
| B.4.2.8. Do the evidences provided doubtlessly prove that continuous and real actions were taken in order to secure the CDM status? | *Description:*<br>Not applicable since the project start date is after 2nd August 2008.<br>*Justification of evidences:* | /MD/<br>/EB49, Annex22/ | OK | OK |

| **Checklist Item**<br>(incl. guidance for the validation team) | **Validation Team Comments**<br>(justification and substantiation of information, data and evidences) | **Ref.** | **Draft Concl.** | **Final Concl.** |
|---|---|---|---|---|
| (EB 55 Annex 1, § 102; EB 49 Annex 22 § 7) | *Conclusion:* | | | |
| B.4.2.9. Is the gap of documented evidences to secure the CDM status less than 3 years and are the evidences relevant for substantiating the action taken, credible, reliable and complete?<br>(EB 49 Annex 22 § 8) | *Description:* As the start date of the project activity 05/10/2009 which is after 2nd August 2008, this question is not applicable.<br><br>*Justification of evidences:* The 05/10/2009 is the date on which an order for civil works was placed by M/S SLS Power Corporation Limited to Sri Lakshmi Constructions Ltd. Further, the assessment team has cross checked the documentary evidence for communication to DNA and UNFCCC which is found to be OK.<br><br>*Conclusion: OK* | /PO/<br>UN&DNA /<br>/PDD/ | OK | OK |
| B.4.2.10. Did implementation of the project ceased after its commencement and did implementation recommence after consideration of the CDM?<br>(EB 51 Annex 58, § 7)<br>*Describe the reasons for ceasing the project and explain why the incentive from CDM was necessary to recommence the implementation.* | *Description:*<br>Project activity is a greenfield project and there is no cessation.<br>*Justification of evidences:*<br>The project activity is Greenfield project, which has been checked during site visit and subsequent approval, document review.<br>The following documents have been checked and found that | /SC/<br>/PDD/<br>/IM01/ | OK | OK |

| Checklist Item (incl. guidance for the validation team) | Validation Team Comments (justification and substantiation of information, data and evidences) | Ref. | Draft Concl. | Final Concl. |
|---|---|---|---|---|
| | the project is green field project.<br>• Consent from Andhra Pradesh State PollutionControl Board (AP SPCB) to establish the plant dated 27/01/2011<br>• Clearance from the Irrigation & CAD (PW: Reforms) Department for utilizing the water resources in the Andhra Pradesh state on 17th August 2009<br><br>*Conclusion:*<br>The project activity did not cease after commencement. | | | |
| B.4.2.11. Can the CDM involvement in the decision assessed as serious?<br>(EB 55 Annex 1, § 104(b)–(c))<br>*Describe whether or not the project would have been undertaken without the incentive of the CDM.* | *Description:* The CDM is considered serious as reflected in the board decision to proceed with the project<br>*Justification of evidences:* The board note is cross checked by the assessment team and found that decision to proceed with the project taken by a person which has the authority to do so.<br><br>*Conclusion:* OK | /MD/<br>/IM/<br>/VVM/ | OK | OK |
| **B.4.3. Identification of alternatives Step 1**<br>(in case of SSC projects pl. skip steps 1 and 2 if appropriate) | | | | |
| B.4.3.1. Does the list of alternatives contain the | *Description:* | /PDD/ | ~~1~~ | OK |

| Checklist Item<br>(incl. guidance for the validation team) | Validation Team Comments<br>(justification and substantiation of information, data and evidences) | Ref. | Draft Concl. | Final Concl. |
|---|---|---|---|---|
| status-quo situation, the project not undertaken as a CDM project as well as all other viable means of supplying the outputs or sevices that are to be supplied by the proposed CDM project activity?<br>(EB 55 Annex 1, §§ 105–107)<br>*Describe the steps taken to validate this issue on the basis of your local and sectoral knowledge.* | The following alternatives to the project are listed below and includes the alternative "project not undertaken as a CDM project":<br>• The proposed project activity without CDM<br>• Continuation of the current situation<br>• Construction of fossil fuel based power plant with same capacity<br>• Construction of a power plant using another renewable energy resource<br>Transparent and detailed description of the identified baseline scenario, data, parameters and description of the technology needs to be incorporated in the PDD. Hence, CAR B2 was raised during the course of validation.<br>*Justification of evidences:*<br>The PDD was checked carefully.<br>*Conclusion:*<br>Transparent and detailed description of the baseline have not been included in the PDD. Revision necessary. | /ACM0002/<br>/APERC/ | OK | |
| B.4.3.2. Have all realistic alternatives been identified to the project?<br>(EB 55 Annex 1, §§ 105–107) | *Description:*<br>The following alternative to the project described | /PDD/<br>/ACM0002/ | ~~Pending CAR~~ | OK |

| **Checklist Item**<br>(incl. guidance for the validation team) | **Validation Team Comments**<br>(justification and substantiation of information, data and evidences) | **Ref.** | **Draft Concl.** | **Final Concl.** |
|---|---|---|---|---|
| *Describe whether the list of alternatives is credible and complete. Describe how it is validated that the alternatives are realistic.* | • The proposed project activity without CDM<br>• Continuation of the current situation<br>• Construction of fossil fuel based power plant with same capacity<br>• Construction of a power plant using another renewable energy resource<br>Transparent and detailed description of the identified baseline scenario, data, parameters and description of the technology needs to be incorporated in the PDD. Hence CAR B2 was raised during the course of validation.<br>*Justification of evidences:*<br>Transparent and detailed description of the baseline have not been included in the PDD<br>*Conclusion:*<br>Transparent and detailed description of the baseline have not been included in the PDD | /APERC/ | ~~B2~~ | |
| B.4.3.3. Do all identified alternatives comply with enforced legislations?<br>(EB 55 Annex 1, §§ 106(c))<br>*Describe the steps taken to validate this issue. Refer to the legislations.* | *Description:* Yes, all identified alternatives comply with enforced legislation.<br>*Justification of evidences:* Validation team checked the Electricity Act. At present, there are no rules or legislations restricting the project developer to choose a particular technology. | /PDD/<br>/EIA/<br>/MNRE/ | OK | OK |

| **Checklist Item**<br>(incl. guidance for the validation team) | **Validation Team Comments**<br>(justification and substantiation of information, data and evidences) | **Ref.** | **Draft Concl.** | **Final Concl.** |
|---|---|---|---|---|
| | *Conclusion:* All identified alternatives comply with legislation. | | | |
| **B.4.4. Investment analysis Step 2**<br>*In case the investment analysis as per step 2 is chosen to justify the additionality Annex 2 "Assessment of Financial Parameters" has to be used to provide additonal details of the the calculation parameters..* | | | | |
| B.4.4.1. Does the PDD provide evidence that the project would not be the most economically or financially attractive alternative or economically / financially feasable without the revenues from the sale of CERs?<br>(EB 55 Annex 1, § 108) | *Description:* PDD provides evidence using Equity IRR as the financial indicator that the project activity is not the most economically attractive alternative. However, in this context, CL B1, B6 and B11 have been raised<br>*Justification of evidences:* Additionality Tool, Methodology ACM 0002, worksheet and PDD have been checked.<br>*Conclusion:* Pending closure of CL B1, B6 and B11. | | ~~Pending closure of CAR B1, B6 and B11~~ | OK |
| B.4.4.2. Is an appropriate analysis method chosen for the project (simple cost analysis, investment comparison analysis or benchmark analysis)?<br>(EB 55 Annex 1, § 108; EB 39 Annex 10)<br>*Describe why the selected analysis method is appropriate under consideration of potential revenues and costs, potential project alternatives and potential available benchmark values.* | *Description:* Project developer had chosen Equity IRR to demonstrate the additionality of the project. However, in this context, CL B1, B6 and B11 have been raised<br>*Justification of evidences:* Additionality Tool, Methodology ACM 0002, worksheet and PDD<br>*Conclusion:* Pending closure of CL B1, B6 and B11. | | ~~Pending closure of CAR B1, B6 and B11~~ | OK |

| Checklist Item<br>(incl. guidance for the validation team) | Validation Team Comments<br>(justification and substantiation of information, data and evidences) | Ref. | Draft Concl. | Final Concl. |
|---|---|---|---|---|
| B.4.4.3. Is a clear, viewable and unprotected Excel spreadsheet available for the investment calculation?<br>(EB 55 Annex 1, § 110; EB 51, Annex 58, §8)<br>*Describe the steps taken to validate this issue.* | *Description:* Yes, a clear, viewable and unprotected excel sheet has been submitted<br>*Justification of evidences:* IRR worksheet has been cross checked and found to be correct.<br>*Conclusion:* A clear, viewable and unprotected worksheet has been submitted | | OK | OK |
| B.4.4.4. Does the period chosen for the investment analysis reflect the technical lifetime of the project activity or in case a shorter period is chosen, is the fair value of the project activity's assets at the end of the investment analysis period (as a cash inflow) included?<br>(EB 55 Annex 1, § 109; EB 51 Annex 58 § 3 – 4)<br>*Describe how the technical lifetime / period chosen for calculating financial parameter(s) is reviewed and which documents were utilised in the course of review. Describe furthermore the approach used to check the inclusion of a potential fair value.* | *Description:* The investment analysis reflects the technical lifetime of the project activity. Project developer has also considered 5% of the asset value at the end of the technical life period as salvage value.<br>*Justification of evidences:* IRR Worksheet has been cross checked and found to be OK.<br>*Conclusion:* Worksheet conforms to guidance 3 & 4 of Annex 58, EB 51 | /IRR/ | OK | OK |
| B.4.4.5. Is the (remaining) technical lifetime of existing or project equipment defined in accordance with the guidance of the *Tool to determine the remaining lifetime of equipment*? | *Description:* Not applicable, as it is a green field project<br>*Justification of evidences:* PDD has been cross checked for the same. | /PDD/ | OK | OK |

| Checklist Item<br>(incl. guidance for the validation team) | Validation Team Comments<br>(justification and substantiation of information, data and evidences) | Ref. | Draft Concl. | Final Concl. |
|---|---|---|---|---|
| (EB 50 Annex 15) | *Conclusion* :Not applicable | | | |
| B.4.4.6. Is the fair value calculated in accordance with local accounting regulations (where available) or international best practice?<br>(EB 55 Annex 1, § 109; EB 51 Annex 58, § 4)<br>*State the accounting regulations applied for calculating the fair value and describe why these are applicable under the project specific circumstances. Describe potential mismatches between regulations and the approach applied for calculating the fair value.* | *Description:* Fair value has been included<br>*Justification of evidences:* IRR worksheet has been cross checked and found to be correct.<br>*Conclusion:* Projections conform to guidance 4 of Annex 58, EB 51. | /IRR/ | OK | OK |
| B.4.4.7. Is the book value as well as the expectation of the potential profit or loss included in the fair value calculation?<br>(EB 55 Annex 1, § 109; EB 51 Annex 58, § 4) | *Description:* Book value and potential profit expected are included in the Fair value.<br>*Justification of evidences:* IRR worksheet has been cross checked and found to be correct.<br>*Conclusion:* There is still a salvage value at the end which is conservative (book value after depreciation). | /IRR/ | OK | OK |
| B.4.4.8. Are depreciation and other non-cash related items added back to net profits for the purpose to calculate the financial indicator?<br>(EB 55 Annex 1, § 109; EB 51 Annex 58, § 5) | *Description:* Additionality has been demonstrated using Equity IRR, which does not appear to be appropriate.<br>*Justification of evidences:* PDD, IRR Worksheet, Tool for Demonstration of Additionality and Guidance on Investment Analysis<br>*Conclusion:* Pending closure of CAR B5-B10, CL B2-B5, CL | /IRR/<br>/PDD/ | ~~Pending closure of CAR B5-B10,~~ | OK |

| Checklist Item (incl. guidance for the validation team) | Validation Team Comments (justification and substantiation of information, data and evidences) | Ref. | Draft Concl. | Final Concl. |
|---|---|---|---|---|
| | B7- B10, CL B13-B17 | | ~~CL B2-B5, CL B7-B10, CL B13-B17~~ | |
| B.4.4.9. Is taxation excluded in the investment analysis or is the benchmark intended for post tax comparisons?<br>(EB 55 Annex 1, § 109; EB 51 Annex 58, § 5) | *Description:* Taxation has been included as the benchmark is intended for post tax comparison.<br>*Justification of evidences:* PDD, IRR worksheet, Guidance to Investment Analysis have been cross checked and found to be OK.<br>*Conclusion:* Computation is in conformity with Guidance 5 of Annex 58, EB 51. | /IRR/<br>/PDD/ | OK | OK |
| B.4.4.10. Were the input values used in the investment analysis valid and applicable at the time of the investment decision?<br>(EB 55 Annex 1, § 109,112; EB 51 Annex 58, § 6)<br>*In case the basis for input values is a Feasibility Study Report (FSR) describe how it has been ensured that the period in time between the finalisation of the FSR and the investment decision is sufficiently short so that it is unlikely that input values would have* | *Description:* Input values are sourced from DPR which formed the basis of investment decision. However, CAR B5-B7 and CL B7-B10 and B13-B16 have been raised.<br>*Justification of evidences:* IRR worksheet has been cross checked and found the non-compliance.<br>*Conclusion:* Pending closure of CAR B5-B7 and CL B7-B10 and B13-B16 | /PDD/<br>/IRR/ | ~~Pending closure of CAR B5-B7 and CL~~ | OK |

| Checklist Item<br>(incl. guidance for the validation team) | Validation Team Comments<br>(justification and substantiation of information, data and evidences) | Ref. | Draft Concl. | Final Concl. |
|---|---|---|---|---|
| *materially changed. Further confirm the consistency of values in FSR and PDD.* | | | ~~B7-B10 and B13-B16~~ | |
| B.4.4.11. Is the plant load factor (PLF) chosen in a conservative manner, taking into account that the PLF may be different in the framework of demonstrating additionality and calculating the ex-ante ER?<br>(EB 48, Annex 11) | *Description:* PLF is based on the hydrological study by Engineering Consultants Group, a third party engineering company engaged by the Project developer<br><br>*Justification of evidences:* IRR worksheet and DPR have been cross checked for the same.<br><br>*Conclusion:* PLF conforms to Annex 11, EB 48. | /IRR/<br>/DPR/ | OK | OK |
| B.4.4.12. In case of project IRR: Are the costs of financing expenditures (loan repayments and interests) excluded from the calculation of project IRR?<br>(EB 55 Annex 1, § 109; EB 51 Annex 58, § 9) | *Description:* Additionality has been demonstrated using Equity IRR, which does not appear to be appropriate. Hence, this question is not applicable<br><br>*Justification of evidences:* IRR worksheet, PDD have been cross checked for the same and found to be OK<br><br>*Conclusion:* Not applicable | /PDD/<br>/IRR/ | OK | OK |
| B.4.4.13. In cases where a post-tax benchmark is | *Description:* Actual interest payable has been taken into | /PDD/ | ~~Pendi~~ | OK |

| Checklist Item (incl. guidance for the validation team) | Validation Team Comments (justification and substantiation of information, data and evidences) | Ref. | Draft Concl. | Final Concl. |
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| applied please ensure that actual interest payable is taken into account in the calculation of income tax.<br>(EB 51 Annex 58, § 11)<br>*As per the guidance it is recommended to select a pre tax benchmark in order to Describe the steps taken in assessing this requirment.* | account in calculation of Income Tax. In this context CL B16 has been raised<br>*Justification of evidences:* Loan sanction letter, IRR worksheet, PDD have been cross checked for the same.<br>*Conclusion:* Pending closure of CL B16. | /IRR/ | ~~ng closure of CL B16~~ | |
| B.4.4.14. In case of equity IRR: Is the part of the investment costs, which is financed by equity considered as net cash outflow and is the part financed by debt excluded in net cash outflow?<br>(EB 55 Annex 1, § 109; EB 51 Annex 58, § 10) | *Description:* Only that part of the investment costs, which is financed by equity has been considered.<br>*Justification of evidences:* IRR worksheet, PDD have been cross checked for the same .<br>*Conclusion:* Computation conform to § 10 Annex 58, EB 51 | /PDD/<br>/IRR/ | OK | OK |
| B.4.4.15. Is the type of benchmark chosen appropriate for the type of IRR calculated (e.g. local commercial lending rates or weighted average costs of capital for project IRR; required/expected returns on equity for equity IRR)?<br>(EB 55 Annex 1, § 111; EB 51 Annex 58, §§12 – 15)<br>*In case risk premiums are applied precisely describe its suitability to reflect the risks associated with the project activity, considering the project type and market situation.* | *Description:* Expected/required rate of return has been used as benchmark, which is appropriate. However, CAR B4 has been raised<br>*Justification of evidences:* IRR worksheet, PDD have been cross checked for the same.<br>*Conclusion:* Pending closure of CAR B4 | /IRR/<br>/PDD/ | ~~Pending closure of CAR B4-,~~ | OK |
| B.4.4.16. Is the benchmark value suitable for the | *Description:* Benchmark is suitable for the financial indicator | /IRR/ | ~~Pendi~~ | OK |

| **Checklist Item**<br>(incl. guidance for the validation team) | **Validation Team Comments**<br>(justification and substantiation of information, data and evidences) | **Ref.** | **Draft Concl.** | **Final Concl.** |
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| project activity and is it reasonable to assume that no investment would be made at a rate of a lower return than the benchmark?<br>(EB 55 Annex 1, § 109; EB 51 Annex 58, §§13 – 15)<br>*Describe whether it is reasonable to assume that a lower rate of return would consequently result in the baseline scenario.* | and it is reasonable to assume that the investment would not have taken place at a return lower than the benchmark. However, CAR B4 has been raised<br><br>*Justification of evidences:* IRR worksheet, PDD have been cross checked for the same.<br><br>*Conclusion:* Pending closure of CAR B4 | /PDD/ | ~~ng closure of CAR B4~~ | |
| B.4.4.17. Is it ensured that the project cannot be developed by other developers than the PP?<br>(EB 55 Annex 1 § 109; EB 51 Annex 58, §§ 13 – 14)<br>*Describe why the benchmark does not include the subjective profitability expectations or risk profile of the project developer. If applicable assess the past financial behavior of the entity during at least the last 3 years in relation to similar projects.* | *Description:* Not applicable; the project can be developed by other project developers.<br><br>*Justification of evidences:* PDD has been cross checked for the same.<br><br>*Conclusion:* Not applicable | /PDD? | OK | OK |
| B.4.4.18. Was the benchmark consistently used in the past for similar projects with similar risks?<br>(EB 55 Annex 1, § 112(c)) | *Description:* Not applicable<br><br>*Justification of evidences:* Not applicable<br><br>*Conclusion:* Not applicable | | OK | OK |
| B.4.4.19. Does the PDD and related spreadsheets | *Description:* PDD and related spreadsheets contain a | /IRR/ | ~~Pendi~~ | OK |

| Checklist Item<br>(incl. guidance for the validation team) | Validation Team Comments<br>(justification and substantiation of information, data and evidences) | Ref. | Draft Concl. | Final Concl. |
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| contain a sensitivity analyis and does the same contain variation of parameters which may vary throughout the project lifetime,<br>(EB 55 Annex 1, §§ 109–110(e); EB 51 Annex 58, § 17–18)<br>*Describe relevance of parameters used in the sensitivity analysis as well as their likeliness to vary during the project's lifetime. Parameters which are fixed on the basis of contracts, PPAs etc. may not be subject to variation and not adequate.* | sensitivity analysis. The following parameters are subject to variations:<br>• Project cost<br>• Tariff<br>• Electricity generation<br>• O&M cost<br>*Justification of evidences:* IRR worksheet and PDD have been cross checked for the same.<br>*Conclusion:* Pending closure of CAR B8 | /PDD/ | ~~ng closure of CAR B8~~ | |
| B.4.4.20. Were only variables that constitute more than 20% of either total project costs or total project revenues subjected to reasonable variation?<br>(EB 55 Annex 1, § 109; EB 51 Annex 58, § 17) | *Description:* Yes, variables, which constitutes more than 20% of project costs or revenue are subjected to reasonable variation. In this context CAR B8 has been raised<br>*Justification of evidences:* IRR worksheet, PDD have been cross checked for the same.<br>*Conclusion:* Subject to closure of CAR B8 | /IRR/<br>/PDD/ | ~~Pending closure of CAR B8~~ | OK |
| B.4.4.21. Have parameters, constituting less than 20% of total project costs or revenues, been identified with potential material impact on the financial parameter? | *Description:* No variables, which constitutes less than 20% of project costs or revenue (there is only one, viz., administrative expenses) are not subjected to sensitivity analysis In this context CAR B8 has been raised | /IRR/<br>/PDD/ | ~~Pending closure of CAR~~ | OK |

| **Checklist Item**<br>(incl. guidance for the validation team) | **Validation Team Comments**<br>(justification and substantiation of information, data and evidences) | **Ref.** | **Draft Concl.** | **Final Concl.** |
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| (EB 55 Annex 1, § 109; EB 51 Annex 58, § 17)<br>*Describe whether those parameters are considered in the sensitivity analysis?* | *Justification of evidences:* IRR worksheet and PDD have been cross checked for the same.<br>*Conclusion:* Subject to closure of CAR B8 | | ~~B8~~ | |
| B.4.4.22. Is the range of variation reasonable in the specific context of the project activity, taking into consideration historic trends in the business sector?<br>(EB 55 Annex 1, § 109; EB 51 Annex 58, § 18)<br>*Describe whether the range of variation is appropriate with focus on historic developments, e.g. price of oil / labour etc., energy potential in the region in question.* | *Description:* Yes, variables, which constitutes more than 20% of project costs or revenue are subjected to reasonable variation. In this context CAR B8 has been raised<br>*Justification of evidences:* IRR worksheet, PDD have been cross checked for the same.<br>*Conclusion:* Subject to closure of CAR B8 | /IRR/<br>/PDD/ | ~~Pending closure of CAR B8~~ | OK |
| B.4.5. **Barrier analysis Step 3 or SSC additionality assessment** | | | | |
| B.4.5.1. Are there any barriers given which have a clear and direct impact on the financial returns of the project?<br>(EB 55 Annex 1, §§ 115, 134, 137)<br>*In case of LSC projects those issues cannot be considered as barriers and shall be assessed in the investment analysis. In case of SSC projects the same fundamentals as for LSC projects shall apply, i.e. the assessment of the investment barrier according to EB 51 Annex 58.* | *Description:* Project developer has not chosen barrier analysis<br>*Justification of evidences:* Not applicable<br>*Conclusion:* Not applicable | | OK | OK |
| B.4.5.2. Are the barriers described risk related (e.g technology failure, other performance | *Description:* Not applicable | /PDD/ | OK | OK |

| Checklist Item (incl. guidance for the validation team) | Validation Team Comments (justification and substantiation of information, data and evidences) | Ref. | Draft Concl. | Final Concl. |
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| related risks)?<br>(EB 55 Annex 1, §§ 116, 134, 137)<br>*Are there other barriers or barriers due to prevailing practice existent which would have led to higher emissions?* | *Justification of evidences:* Not applicable<br>*Conclusion:*Not applicable | | | |
| B.4.5.3. Has the unavailabilty of means of finance for the proejct been described and adequately substantiated? Do evidences doubtlessly prove that the financing of the project was assured only due to the benefit of the CDM?<br>(EB 55 Annex 1, §§ 116, 137, EB 50 Annex 13, § 9) | *Description:* Not applicable<br>*Justification of evidences:* Not applicable<br>*Conclusion:*Not applicable | /PDD/ | OK | OK |
| B.4.5.4. How is it justified and evidenced that the barriers given in the PDD are real?<br>(EB 55 Annex 1, § 116(a)) | *Description:* Not applicable<br>*Justification of evidences:* Not applicable<br>*Conclusion:*Not applicable | /PDD/ | OK | OK |
| B.4.5.5. How is it justified that one or a set of real barriers prevent(s) the implementation of the project activity and do not prevent the implementation of at least one of the alternatives?<br>(EB 55 Annex 1, § 116(b)) | *Description:* Not applicable<br>*Justification of evidences:* Not applicable | /PDD/ | OK | OK |

| Checklist Item (incl. guidance for the validation team) | Validation Team Comments (justification and substantiation of information, data and evidences) | Ref. | Draft Concl. | Final Concl. |
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| | *Conclusion:*Not applicable | | | |
| B.4.5.6. Does the review of relevant background information on the nature of the company(ies) and entitiy(ies) involved in the financing and implementation of the project sufficiently justify that the barriers related to the lack of access to capital, technologies and skilled labour are real?<br>(EB 50 Annex 13, § 4) | *Description:* Not applicable<br>*Justification of evidences:* Not applicable<br>*Conclusion:*Not applicable | /PDD/ | OK | OK |
| B.4.5.7. Has it been demonstrated in an objective way how the CDM alleviates each of the identified barriers to a level that the project is not prevented anymore from occurring by any of the barriers?<br>(EB 50 Annex 13, § 5) | *Description:* Not applicable<br>*Justification of evidences:* Not applicable<br>*Conclusion:*Not applicable | /PDD/ | OK | OK |
| B.4.5.8. Would provision of additional financial means lead to the mitigation of the barrier(s) demonstrated?<br>(EB 50 Annex 13, § 7)<br>*Describe why provision of additional financial means would not lead to mitigation of the barrier(s) demonstrated and hence analysing the project's additionality within the framework of an investment analysis is inappropriate. .* | *Description:* Not applicable<br>*Justification of evidences:* Not applicable<br>*Conclusion:*Not applicable | /PDD/ | OK | OK |

| Checklist Item<br>(incl. guidance for the validation team) | Validation Team Comments<br>(justification and substantiation of information, data and evidences) | Ref. | Draft Concl. | Final Concl. |
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| **B.4.6. Common practice analysis Step 4**<br>(in case of SSC projects skip this step) | | | | |
| B.4.6.1. Is the defined region for the common practice analysis appropriate for the technology/industry type?<br>(EB 55 Annex 1, § 120(a))<br>*Describe why the project activity is not common practice in a transparent and unambiguous manner. If a region other than the entire host country is chosen, describe why this region is more appropriate.* | *Description:* The common practice analysis does not conform to step 4 of the Tool for demonstration and assessment of additionality. In this context, CAR B9 has been raised<br><br>*Justification of evidences:* PDD have been cross checked for the same.<br><br>*Conclusion:* Pending closure of CAR B9 | /PDD/<br>/TA/ | ~~Pending closure of CAR B9~~ | OK |
| B.4.6.2. To what extent similar projects have been undertaken in the relevant region?<br>(EB 55 Annex 1, § 120(b)) | *Description:* The common practice analysis does not conform to step 4 of the Tool for demonstration and assessment of additionality. In this context, CAR B9 has been raised<br><br>*Justification of evidences:* PDD have been cross checked for the same.<br><br>*Conclusion:* Pending closure of CAR B9 | /PDD/<br>/TA/ | ~~Pending closure of CAR B9~~ | OK |
| B.4.6.3. In case similar projects are identified, are there any key differences between the proposed project and existing or ongoing projects and what kind of differences are observed?<br>(EB 55 Annex 1, § 120(c)) | *Description:* The common practice analysis does not conform to step 4 of the Tool for demonstration and assessment of additionality. In this context, CAR B9 has been raised<br><br>*Justification of evidences:* PDD | /PDD/<br>/TA/ | ~~Pending closure of CAR B9~~ | OK |

| Checklist Item<br>(incl. guidance for the validation team) | Validation Team Comments<br>(justification and substantiation of information, data and evidences) | Ref. | Draft Concl. | Final Concl. |
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| | *Conclusion:* Pending closure of CAR B9 | | | |
| **B.5. Ex-Ante Calculation of GHG Emission Reductions**<br>*It is assessed whether the ex-ante calculations of project emissions, baseline emissions, leakage emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified. Furthermore calculation of emission reductions shall be assessed.* | | | | |
| B.5.1. Are the equations applied correctly according to the applied approved methodology?<br>(EB 55 Annex 1, §§ 67(c), 89–90, 92)<br>*Describe clearly the steps taken to assess whether the methodology has been applied correctly to calculate project emissions, baseline emissions, leakage and emission reductions. Further take into consideration that all estimates of the baseline emissions can be replicated using the data and parameter values provided in the PDD.* | ☐ The equations applied for calculation are correctly applied according to the approved methodology.<br>☒ The following mistakes have been identified in this context:<br>*Description:*<br>The emission reduction calculation has followed the equations as per the approved methodology ACM0002 version 12.1.0. Furthermore CAR B11 was raised during validation.<br>*Justification of evidences:*<br>PP is requested to provide a transparent calculation procedure in section B.6.1 to calculate (ex-ante) the area of | /ACM0002/ | ~~CAR B11~~ | OK |

| **Checklist Item**<br>(incl. guidance for the validation team) | **Validation Team Comments**<br>(justification and substantiation of information, data and evidences) | **Ref.** | **Draft Concl.** | **Final Concl.** |
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| | reservoir measured in the surface water, after implementation of the project activity.<br><br>*Conclusion:*<br>Pending closer of CAR B11 | | | |
| B.5.2. In case the methodology allows for different methodological choices, are the equations applied properly justified and have they been used reflecting the other methodological choices (i.e. baseline identification)?<br><br>(EB 55 Annex 1, §§ 90–91)<br>*Assess the correct selection and application of methodological choices. Describe whether proper justification has been provided (based on the choice of the baseline scenario, context of the project activity and other evidence provided) and whether the correct equations have been used reflecting the relevant methodological choices.* | *Description:*<br>The methodology does not provide choices for hydro power plants, the equations used for baseline emission and project emissions are correctly applied.<br><br>*Justification of evidences:*<br><br>During the discussion with the client and site visit it was observed that the emission reductions are calculated as per the provisions of the methodology.<br><br>*Conclusion:*<br><br>The equations are applied correctly. | /ACM0002/ | OK | OK |
| B.5.3. Have conservative assumptions been used when calculating the project emissions?<br><br>(EB 55 Annex 1, §§ 90–91)<br>*Describe clearly the steps taken to assess whether all the assumptions and data used by the PP are listed in the PDD including references and sources and are conservatively interpreted in the PDD.* | *Description:*<br><br>The assumption (1.5%) of transmission losses should be explained in section B.6.1 with all the assumed parameters based on the transformer-AOTRANSO Grid-TATA Power. Further, the same should be substantiated with the calculation.<br><br>*Justification of evidences:*<br><br>Transmission losses should be explained in section B.6.1 | /ACM0002/<br><br>/VVM/ | ~~CAR B12~~ | OK |

| Checklist Item (incl. guidance for the validation team) | Validation Team Comments (justification and substantiation of information, data and evidences) | Ref. | Draft Concl. | Final Concl. |
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| | with all the assumed parameters<br>*Conclusion:*<br>The transmission losses should be explained in section B.6.1 | | | |
| B.5.4. Does the implementation of the project activity lead to GHG emissions within the project boundary which are expected to contribute more than 1% of the overall expected average annual emission reductions, which are not addressed by the methodology?<br>(EB 55 Annex 1, § 77) | *Description:* Though the project activity is a green filed project , a on-site DG set will be installed during the project activity as a stand by. Hence, the same is being monitored as against CAR B14.<br>*Justification of evidences:* During the site visit and interview with the client it was found that there would be a on-site DG set available as a standby during teh project activity. Hence, CAR B14 is raised to adress this issue.<br>*Conclusion*: DG set electricity consumption is being monitored now in the revised PDD. CAR B14 is closed. | /ACM0002/<br>/DPR/<br>/PDD/<br>/CEA/ | ~~CAR B4~~ | OK |
| B.5.4.1. Has a plant load factor (PLF) been defined ex-ante and considered for determination of baseline emissions?<br>(EB 48 Annex 11, §§ 1, 3–4)<br>*Describe why the PLF is conservative in the framework of calculating emissions reductions and whether the PLF is the same in the framework of demonstrating additionality by applying the investment analysis. Note, in order to be conservative in both cases the PLF may be different.* | *Description:*<br>The ex-ante plant load factor for the project activity is 49.18 % as per the IREDA Loan document.<br>*Justification of evidences:*<br>PLF for the project activity is 49.18% as per the Loan document which is in line with EB 48 annex 11. This is acceptable. The hydrology study (DPR) has been cross checked for and found to be OK. However, the Global stake holders have commented the conservativeness of the PLF:<br>The document shows that the project in will be operating at a | /UNFCCC/<br>/DPR/<br>/LOAN/<br>/APERC/ | OK | OK |

| **Checklist Item**<br>(incl. guidance for the validation team) | **Validation Team Comments**<br>(justification and substantiation of information, data and evidences) | **Ref.** | **Draft Concl.** | **Final Concl.** |
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| | PLF of 49.18%. The Andhra Pradesh Electricity Regulatory Commission (APERC) in its tariff order for renewable energy plants dated 20-03-2004 considered 35% PLF appropriate as the output of power from mini hydro plants is dictated by irrigation needs (paragraph 66). APERC based this estimate on historical water availability information. Pls see Annex 5 for more information.<br><br>*Conclusion*<br>PLF of the project activity is 49.18%. | | | |
| B.5.5. Are all data sources and assumptions appropriate and parameters which remain fixed throughout the crediting period correct, applicable to the project and will lead to a conservative estimation of emission reductions?<br>(EB 55 Annex 1, § 91)<br>*Describe clearly the steps taken to assess whether the values used for the fixed parameters are considered reasonable, correct and applicable in the context of the project activity. Check esp. chapter 6.2 of the PDD.* | *Description:*<br>All the data and parameters described in the section B.6.2 of the PDD are correctly applied and the values assumed have been applied correctly.<br>*Justification of evidences:*<br>The ex-ante parameters fixed for the estimation of emission reduction is as per the stipulated methodology. The same is cross checked by the assessment team and found correct.<br><br>*Conclusion:*<br>All the ex-ante data and parameters applied are as per the stipulated methodology. | /ACM0002/<br>/CEA/<br>/DPR/<br>/PDD/ | OK | OK |
| B.5.6. Are all ex-ante calculation values for | ☐ All “Values of data to be applied for the purpose of | /ACM000 | | OK |

| **Checklist Item**<br>(incl. guidance for the validation team) | **Validation Team Comments**<br>(justification and substantiation of information, data and evidences) | **Ref.** | **Draft Concl.** | **Final Concl.** |
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| monitoring parameters (as defined as per chapter B.7.1) reasonable?<br><br>(EB 55 Annex 1, § 91)<br>*Describe clearly the steps taken to assess whether the values used for the monitoring parameters are considered reasonable, applicable and conservative in the context of the project activity* | calculating expected emissions reductions" are considered to be reasonable, applicable and conservative.<br>☒ The following mistakes have been identified in this context:<br><br>~~CAR B13, CAR B14 and CAR B15~~ | 2/<br>/PDD/ | ~~CAR B13~~<br><br>~~CAR B14 and~~<br><br>~~CAR B15~~ | |
| B.5.7. Are the emission reductions real, measurable and give long-term benefits related to the mitigation of climate change.<br>*Describe the steps taken to validate this issue.* | *Description:*<br>The emission reductions due to the project are based on the electricity generated by the hydro power plant times the emission factor of the grid. Thus the emission reduction are real, measurable and provides long term benefits<br><br>*Justification of evidences:*<br>The emission reductions are real and measurable considering the baseline scenario. There are not hypothetical and virtual emission involved in the project activity. The calculations are correct.<br><br>*Conclusion:*<br>The emission reductions from the project are real, measurable and provide long term benefits in mitigation of climate change. | /ACM0002/<br>/PDD/ | OK | OK |

| Checklist Item<br>(incl. guidance for the validation team) | Validation Team Comments<br>(justification and substantiation of information, data and evidences) | Ref. | Draft Concl. | Final Concl. |
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| **B.6. Monitoring of Emission Reductions**<br>*It is assessed whether the monitoring plan is appropriate for the project activity and in line with the applied methodology.* | | | | |
| B.6.1. Are all monitoring parameters required by the applied methodology contained in the monitoring plan?<br>(EB 55 Annex 1, §§ 67(e), 121, 123(a), 124)<br>*Assess whether all applicable parameters listed in the methodology are included in the monitoring plan.*<br>*Pl. check further whether the selection of parameters not to be monitored (section B.6.2) is appropriate and in line with the applied methodology.*<br>*In case of different approaches can be chosen acc. to the methodology assess whether the selection of parameters is justified and correct.* | *Description:*<br>All the monitoring parameters required by the applied methodology are not in line with the approved methodology.<br>*Justification of evidences:*<br>Section B.7.1 of the PDD is not in line with the methodology ACM0002 version 12.1.0.<br>*Conclusion:*<br>All the monitoring parameters required by the applied methodology are in line with the approved methodology. | /ACM0002/<br>/PDD/ | ~~Pending closer of CAR B13 CAR B14 and CAR B15~~ | |
| B.6.2. Are the means of monitoring of all parameters contained in the monitoring plan feasible and in accordance with the requirements of the applied methodology?<br>(EB 55 Annex 1, § 123(a)–(b), 124)<br>*Assess whether the provided information for all parameters w.r.t.* | *Description:*<br>All the monitoring parameters contained in the monitoring plan are applied as per the requirement of the methodology, however pending CAR B 13.<br>Section B.7.1 of the PDD is not in line with the methodology ACM0002 version 12.1.0. | /ACM0002/<br>/PDD/<br>/UNFCCC/ | ~~Pending closer of CAR B13~~ | |

| **Checklist Item**<br>(incl. guidance for the validation team) | **Validation Team Comments**<br>(justification and substantiation of information, data and evidences) | **Ref.** | **Draft Concl.** | **Final Concl.** |
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| a) *Label (name of the data / parameter)*<br>b) *data unit*<br>c) *description*<br>d) *source of data*<br>e) *measurement equipment / method / procedure*<br>f) *monitoring frequency*<br>g) *QA/QC procedures*<br>*are appropriately described and in compliance with the requirements of the methodology..* | *Justification:* The monitoring parameters mentioned under section B.71. of the PDD has been checked with the monitoring of the methodological requirements and CDM PDD filling guidelines and found to be in line with the requirements. However, the issue will be closed after closure of CAR B13<br>*Conclusion:*<br>All the monitoring parameters required by the applied methodology are in line with the approved methodology. | | | |
| B.6.3. Have all means of implementing the monitoring plan, e.g. equations necessary for ex-post emission reduction calculation, been described clearly and in line with the methodology?<br>(EB 55 Annex 1, §§ 123(b), 124)<br>*Check whether all necessary equations have been provided in the PDD. PI. consider that ex-post and ex-ante calculations might be different.*<br>*Please consider that additional equations might be necessary to calculate auxiliary parameters.* | *Description:*<br>The methodology ACM0002 version 12.1.0 has been followed. Also the necessary equations for ex-post emission reduction calculation have been described clearly and are in line with the methodology.<br>*Justification of evidences:*<br>All the necessary equations for ex-post calculation for emission reduction have been applied correctly. Same has been cross-checked with methodology by the validation team and found to be correct.<br>*Conclusion:*<br>All the necessary equations for ex-post calculation for emission reduction have been applied correctly. | /ACM0002/<br>/VVM/ | OK | OK |

| **Checklist Item**<br>(incl. guidance for the validation team) | **Validation Team Comments**<br>(justification and substantiation of information, data and evidences) | **Ref.** | **Draft Concl.** | **Final Concl.** |
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| B.6.4. Is it likely that the monitoring arrangements described in the PDD can properly be implemented in the context of the project activity?<br><br>(EB 55 Annex 1, § 124(c))<br>*Assess whether the described monitoring arrangements are sufficient and realistic to enable a thorough monitoring. Pl. consider also special monitoring conditions, e.g. downtimes of monitoring equipment etc.* | *Description:*<br>The monitoring arrangements are in line with the requirements described in the PDD.<br><br>*Justification of evidences:*<br>The monitoring arrangements were checked during the site visit and are in line with the description in the PDD.<br><br>*Conclusion:*<br>The monitoring arrangements described in the PDD are implemented in the project activity | /ACM0002/<br>/PDD/<br>/VVM/ | OK | OK |
| B.6.5. Are the QA/QC procedures appropriate sufficient to ensure the emission reductions achieved from the project activit can be reported ex-post and verified?<br><br>(EB 55 Annex 1, § 124(b))<br>*Please consider the description given in section B.7.2. Describe which QA/QC provisions are considered. Address Quality Management System provisions, calibration and maintenance of equipment. Address further any review procedures.* | *Description:* During the site visit, assessment team conducted the interviews for the same and found that the monitoring arrangements will be implemented as per the PDD. As the project is green field project, no arrangements are in place at this stage of implementation.<br><br>*Justification of evidences:* During the site visit and subsequent interview with the client it can be concluded that the monitoring arrangements described in the PDD can properly be implemented in the context of the project activity. However, compliance of the same should be checked during the verification process. | /ACM0002/<br>/PDD/ | OK | OK |

| **Checklist Item**<br>(incl. guidance for the validation team) | **Validation Team Comments**<br>(justification and substantiation of information, data and evidences) | **Ref.** | **Draft Concl.** | **Final Concl.** |
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| | *Conclusion:*<br>Appropriate QA/QC measures have been adopted wherever applicable for the monitoring parameters. A third reference/approach has been considered as a plausibility check for the monitoring parameters wherever it is applicable. | | | |
| B.6.6. Are procedures identified for data management?<br>(EB 55 Annex 1, § 124(b))<br>*Check whether appropriate provisions are considered for data management including responsibilities, what records to keep, storage area of records and how to process performance documentation*<br>*Check further the data archiving provisions for the project activity and ensure that provisions are made to archive data for the whole crediting period + 2 years.* | *Description:* The QA/QC procedure is described in the revised PDD. However, the compliance of the same should be checked during the verification process.<br>*Justification of evidences:* All the QA/QC procedure is described in the PDD according to the requirements of methodology and indicative simplified baseline and monitoring methodologies for selected small-scale CDM project activity categories and found to be OK.<br>*Conclusion:* Appropriate measures have been taken to adopt the data management procedures ,i.e. roles, responsibilities, archiving procedures, monitoring, record keeping etc. | /PDD/<br>ACM0002/ | OK | OK |
| ***C. Duration of the Project/ Crediting Period***<br>*It is assessed whether the temporary boundaries of the project are clearly defined.* | | | | |

| **Checklist Item**<br>(incl. guidance for the validation team) | **Validation Team Comments**<br>(justification and substantiation of information, data and evidences) | **Ref.** | **Draft Concl.** | **Final Concl.** |
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| C.1. Is the project's starting date clearly defined and evidenced?<br><br>(EB 55 Annex 1, § 99)<br>*Check whether the starting date is correct. Apply the definition of the project starting date as per the "Glossary of CDM terms".* | *Description:*<br><br>The start date of the project activity is 05/10/2009 which is as per the order released for civil construction of the project activity and is acceptable.<br><br>*Justification of evidences:*<br>An interview was conducted to verify the starting date of the project activity assumed in the PDD.<br><br>*Conclusion:*<br><br>Since as per the Glossary of CDM terms the start date is the earliest date of real action/implementation, the placement of order for civil construction is considered as the date of real action and is hence acceptable. | /WO-Civil construction/ | OK | OK |
| C.2. Is the project's operational lifetime clearly defined and evidenced?<br><br>*Check whether the project lifetime is correctly defined. Consider the guidance on the assessment of investment analysis (annex to the additionality tool).*<br><br>*Check in case of phased implementation this has been reflected throughout the whole PDD incl. the financial assessment, if applicable.* | *Description:*<br>The operation lifetime of the project is clearly defined as 25 years based on the lifetime of the project equipment.<br><br>*Justification of evidences:*<br>The project lifetime is as per the technical specifications of the project equipment. The PDD and the IRR calculation have also been checked.<br><br>*Conclusion:*<br><br>The project lifetime is defined as per the technical specifications and is acceptable. | /DPR/<br><br>/TS/ | OK | OK |

| **Checklist Item**<br>(incl. guidance for the validation team) | **Validation Team Comments**<br>(justification and substantiation of information, data and evidences) | **Ref.** | **Draft Concl.** | **Final Concl.** |
|---|---|---|---|---|
| C.3. Is the start of the crediting period clearly defined and reasonable?<br><br>*Check whether the envisaged starting date of the crediting period is realistic, taking into consideration the times needed for validation and registration.* | *Description:*<br>The start date of the crediting period is 01/10/2011and is realistic. This is based on CAR C1<br>*Justification of evidences:*<br>The project implementation is scheduled to be completed by this date along with CDM project registration. The timeline of the project activity was discussed during the site visit with the representative of M/S SLS Power Corporation Limited.<br>*Conclusion:*<br>The start date of the crediting period is realistic. | PDD | ~~CAR C1~~ | OK |
| ***D. Environmental Impacts***<br>*Documentation on the analysis of the environmental impacts will be assessed, and if deemed significant, an EIA should be provided to the DOE.* | | | | |
| D.1.1. Are there any Host Party requirements for an Environmental Impact Assessment (EIA)?<br><br>(EB 55 Annex 1, §§ 131–133)<br>*Check the host party regulations, regarding EIA.* | *Description:*<br>The nature of the project does not demand any environmental analysis, the project type/category is not included in the list of project activity required EIA by the MoEF.<br>*Justification of evidences:*<br>This project activity is not included in the list of the project not requiring an EIA by MoEF. | /MoEF/ | OK | OK |

| **Checklist Item**<br>(incl. guidance for the validation team) | **Validation Team Comments**<br>(justification and substantiation of information, data and evidences) | **Ref.** | **Draft Concl.** | **Final Concl.** |
|---|---|---|---|---|
| | http://envfor.nic.in/legis/eia/so1533.pdf<br><br>*Conclusion:* EIA is not required for this project activity. | | | |
| D.1.2. In case an Environmental Impact Assessment (EIA) is requested by the host party, has it been carried out and if applcable duly approved?<br>(EB 55 Annex 1, §§ 131–133)<br>*Check the EIA and its approval, if applicable.* | *Description:*<br>N/A. Pls refer to D.1.1.<br><br>*Justification of evidences:*<br><br>*Conclusion:* | /MoEF/ | OK | OK |
| D.1.3. Has an analysis of the environmental impacts of the project activity been sufficiently described and in line with the host party environmental legislation?<br>(EB 55 Annex 1, §§ 130–132)<br>*Check the PDD (section D). Check whether the project will create any adverse environmental effects.*<br>*Check the relevant national environmental legislation.* | *Description:*<br>N/A. Pls refer to D.1.1.<br><br>*Justification of evidences:*<br><br>*Conclusion:* | /MoEF/ | OK | OK |
| D.1.4. Are transboundary environmental impacts considered in the analysis?<br>(EB 55 Annex 1, §§ 131–133)<br>*Check the documents and local official sources / expertise* | *Description:*<br>N/A. Pls refer to D.1.1.<br><br>*Justification of evidences:* | /MoEF/ | OK | OK |

| **Checklist Item**<br>(incl. guidance for the validation team) | **Validation Team Comments**<br>(justification and substantiation of information, data and evidences) | **Ref.** | **Draft Concl.** | **Final Concl.** |
|---|---|---|---|---|
| *regarding transboundary environmental impacts.* | *Conclusion:* | | | |
| ***E. Stakeholder Comments***<br>*The DOE should ensure that stakeholder comments have been invited with appropriate media and that due account has been taken of any comments received.* | | | | |
| E.1. Have relevant local stakeholders been invited to consultation prior to the publication of the PDD?<br>(EB 55 Annex 1, § 128)<br>*Check by means of document review and interviews with local stakeholders if and when a local stakeholder consultation process has been carried out.* | *Description:*<br>A stakeholder meeting was conducted at the site on 28th December 2009 which was attended by local people and authority. Also the public hearing was conducted on 25th December 2007 in presence of officials from AP-SPCB.<br>*Justification of evidences:*<br>During the discussion with the stakeholders it was concluded that The relevant stakeholders have been invited. Advertisement in local news paper published for Local stakeholder meeting and public hearing and NOC form gram panchayat have been cross checked by the validation team and it is acceptable.<br>*Conclusion:*<br>Relevant stakeholder consultation was carried out before publication of the PDD on UNFCCC website. | /LSHC/ | OK | OK |

| **Checklist Item**<br>(incl. guidance for the validation team) | **Validation Team Comments**<br>(justification and substantiation of information, data and evidences) | **Ref.** | **Draft Concl.** | **Final Concl.** |
|---|---|---|---|---|
| E.2. Can the local stakeholder consultation process be assessed as adequate?<br><br>(EB 55 Annex 1, § 129(a)–(c))<br><br>*Describe what assessment steps have been undertaken to assess the adequacy of the stakeholder consultation process. Give a final opinion on the adequacy.*<br><br>*Please consider the following requirements in this context:*<br><br>*(a) Comments by local stakeholders that can reasonably be considered relevant for the proposed CDM project activity, have been invited;*<br><br>*(b) The summary of the comments received as provided in the PDD is complete;*<br><br>*(c) The project participants have taken due account of any comments received and have described this process in the PDD.* | *Description:* The local stakeholder's consultation meeting was conducted on 28th December 2009 at project site, dummugudem, M/S SLS power corporation limited to receive the comments and suggestions by the local stakeholders on the project activity.<br><br>*Justification of evidences:* A notice was placed in the local Telugu newspaper, the Andhra Jyothi on 22nd December 2009 and comments were invited.The comments received by the local stake holders have been addressed adequately and the summary of the comments have been described in the PDD. Based on the review of the comments, the assessment team concludes that there were no adverse comments received from the local stake holders. The local stakeholder consultation minutes of the meeting was cross checked by the validation team and found correct as positive opinion are received during the process.<br><br>*Conclusion:* Local stajeholder process has been assessed adequately considering the documents available as well as the meetings with stakeholders during the site visit. | /LSHC/ | OK | OK |

# ANNEX 2: ASSESSMENT OF BASELINE IDENTIFICATION

**Table A-2:** Assessment of Baseline Identification (EB 51 Annex 3, §§ 82 – 85)

| | |
|---|---|
| ☐ | Baseline is not identified |
| ☒ | Assessment of baseline see below |

| Baseline Alternatives identified | Inline with the Methodology? | Eliminated | Reasons for elimination / non-elimination from list of alternatives | Evidence used | DOE Assessment | |
|---|---|---|---|---|---|---|
| | | | | | Appropriateness of elimination | Assessment of validation team (results and means of assessment) |
| Setting up the project activity without CDM benefits | ☒ | ☒ | This alternative faces investment barrier as shown by the investment analysis | /INV/ | ☒ | The validation team found that the identified alternative is mandated by all law and regulation but faces investment barrier. Hence, the alternative is eliminated. |

| | | | | | | |
|---|---|---|---|---|---|---|
| Continuation of current scenario i.e. additional power is supplied by current power generating units and / or new power generating units coming up in the grid | ☒ | ☐ | This alternative would result in higher GHG emissions. | /CEA/ /APERC/ MNRE/ | ☒ | The validation team found that the identified alternative is mandated by all law and regulation but would result in higher GHG emissions. |
| All other plausible and credible alternatives to the project activity that provide an increase in the power generated at the site | ☒ | ☒ | This alternative would result in higher GHG emissions. | /INV/ And non availability of coal in Andhra Pradesh | ☒ | The validation team found that the identified alternative is mandated by all law and regulation but would result in higher GHG emissions. |

# ANNEX 3: ASSESSMENT OF FINANCIAL PARAMETERS

**Table A-3:** Assessment of Financial Parameters (EB 51 Annex 3, §§110, 111, 113/ in case financial parameters stem from FSR §112,)

| | |
|---|---|
| ☐ | No financial parameters are used for additionality justification |
| ☒ | Assessment of all financial parameters see below |

| Parameter | Value applied | Unit | Source of Information (please indicate document and page) | Reference | DOE ASSESSMENT | |
|---|---|---|---|---|---|---|
| | | | | | Correctness of value applied | Comment |
| Installed capacity | 24 | MW | DPR and PO | /DPR/ /PO/ | ☒ | The installed capacity is based on the DPR (p.11) and the purchase order placed for the turbines. Moreover, the capacity is also confirmed by the loan sanction letter of IREDA. The input value is therefore correct and appropriate for the project activity |
| Project cost | 1843.5 | INR mn. | DPR and PO | /DPR/ /PO/ /DADO/ | ☒ | The cost is based on the DPR[28] (p.53), yielding a cost of Rs.76.8 mn. per MW. The DPR was available about one month before the board decision. IREDA, the financing institution, has, however, estimated the cost at Rs.1814.7 mn., yielding a cost of 75.6 mn./MW. Validation team compared the cost with other projects (having start date of |

[28] Most of the input parameters are used in the financial indicator calculations are based on DPR. Since the DPR was prepared in August 2008 and the investment decision is reported to have been taken on 15/09/2008, the time gap is so short that the input parameters value would not have altered.

| | | | | | | |
|---|---|---|---|---|---|---|
| ☐ | No financial parameters are used for additionality justification | | | | | |
| ☒ | Assessment of all financial parameters see below | | | | | |
| **Parameter** | **Value applied** | **Unit** | **Source of Information (please indicate document and page)** | **Reference** | **DOE ASSESSMENT** | |
| | | | | | **Correctness of value applied** | **Comment** |
| | | | | | | 2008 or after) and observed that the implementation of all registered projects commenced before 2008. However, of the projects under validation (whose PDD have been web hosted), validation team observed that the cost was ranging between Rs.48.05 mn./MW to Rs.79.86 mn./MW[29]. Though the cost of the candidate project is within the range, since the cost is closer to the higher end of the range, validation team sought a justification for such a high cost by a reputed third party engineering company. In response, the project developer had submitted a report from M/s Dado Hegde Technocrats (P) Ltd[30], a third party engineering and consultancy company.<br><br>Due to some changes made after the board decision, the actual investment itself is expected to be around Rs.2200 mn., though the cost as approved by financial institution is marginally lower. Validation team also observed that the |

[29] It was observed that 5 MW Binua Parai small Hydro Electric Project (02/2008) projected a cost of Rs 66.6 mn./MW; 24 MW Tunga Mini Hydel project (04/2009) projected a cost of Rs.48.05 mn./MW; 4.05 MW Champamati Small Hydro Power Project (07/2008) projected a cost of Rs.79.86 mn./MW; 120 MW grid connected Rangit IV Hydro Power Project (08/2009) projected a cost of Rs.64.61 mn./MW and 4.9 MW Darna Small Hydro Power Project ((10/2008) projected a cost of Rs.60.54 mn./MW

[30] M/s Dado Hegde Technocrats *P) Ltd. Is a design and engineering consultancy company which provides electro mechnical services from concept to completion besides preparation of DPRs, consultancy on transmission lines, substations etc. among others

| | |
|---|---|
| ☐ | No financial parameters are used for additionality justification |
| ☒ | Assessment of all financial parameters see below |

| Parameter | Value applied | Unit | Source of Information (please indicate document and page) | Reference | DOE ASSESSMENT | |
|---|---|---|---|---|---|---|
| | | | | | Correctness of value applied | Comment |
| | | | | | | consideration of cost as finalised by financial institution does not render the project non-additional in as much as the IRR goes up by 23 basis points – from 12.76% to 13.00% - in contrast to the benchmark of 13.63%. However, in view of the fact that this cost was not available to the project developer at the time of decision making and that the actual completion cost is expected to be Rs.2200 mn. validation team considered it appropriate to consider the cost estimated in the DPR, which is in conformity with guidance 6 of Annex 58, EB 51.<br><br>In the above background, validation team considers the cost appropriate and correct |
| Generation (PLF) | 103.4 | Mn. kWh | DPR | /DPR/ | ☒ | Generation has been estimated based on the study of discharge data for the last 12 years by the Engineering Consultants Group, a well known techno-economic consultancy company. Project developer has submitted a copy of the DPR which incorporates the estimation of generation (p.35). The report estimates the generation at 103.4 mn. units per annum. This yields a PLF of 49.18%. APERC has recommended PLF of 35%. Since the PLF |

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| ☐ | No financial parameters are used for additionality justification |
| ☒ | Assessment of all financial parameters see below |

| Parameter | Value applied | Unit | Source of Information (please indicate document and page) | Reference | DOE ASSESSMENT | |
|---|---|---|---|---|---|---|
| | | | | | Correctness of value applied | Comment |
| | | | | | | conforms to the requirements of Annex 11, EB 48, and more than the PLF recommended by APERC, PLF is considered suitable and appropriate for the project activity. |
| Auxiliary consumption | 3 | Percent | DPR | /DPR/ | ☒ | Project developer has considered auxiliary consumption and grid outage at 3%. APERC has recommended Auxiliary consumption of only 1%. To a CAR raised, project developer has submitted a detailed calculation from the machinery suppliers on the estimation of losses provided. The losses include losses of 159.10 KW at 132 Kv transmission line, 150 KW at excitation transformer and 416.50 KW at power house (415V auxiliary loads) of 416.50 KW resulting in a total loss of 725.50 KW. With the installed capacity being 24000 KW, the loss works out to 3.02%, say 3%. Validation team observed that other hydropower projects have also assumed auxiliary consumption and other losses from as low as 0.9% to as high as 9.07%. For example registered projects, 24 MW Sri Ranganathaswamy Mini Hydel Project (No. 1345) and 24 MW Someshwara Small Hydropower Project (No. 1273) – both located in the neighbouring state, Karnataka, have assumed a loss of 3%. Projects under validation, |

| | | | | | | |
|---|---|---|---|---|---|---|
| ☐ | No financial parameters are used for additionality justification | | | | | |
| ☒ | Assessment of all financial parameters see below | | | | | |
| **Parameter** | **Value applied** | **Unit** | **Source of Information (please indicate document and page)** | **Reference** | **DOE ASSESSMENT** | |
| | | | | | **Correctness of value applied** | **Comment** |
| | | | | | | viz., 10 MW Manjanadka Hydro Power project, located in Karnataka has assumed loss of 4%; 6 MW Dadupur Hydro Power project located in Haryana has assumed loss of 9.07% and Darna small Hydropower Project located in Maharashtra has assumed loss of 6%. In the above, background, validation team considers the auxiliary consumption and losses of 3% as reasonable. However, validation team thought it appropriate to provide a FAR on the following lines:<br><br>"*The auxiliary consumption will be monitored periodically and in case the auxiliary consumption is less than 3%, the financial additionality of the project should be revisited*" |
| O&M Cost | 30.65 | INR mn. | DPR | /DPR/ | ☒ | O&M cost is based on the DPR (p.16).. O&M cost accounts for 1.7% of the project cost or Rs.1.28 mn./MW. APERC has recommended 1.5% for O&M cost[31]. Validation team checked the other projects and observed that the O&M cost ranges from Rs.0.6 mn./MW (24 MW |

[31] http://www.aperc.gov.in/OtherOrders/EarlierOrders.html, select **20.03.2004:** Order on purchase of power from NCE projects issued. RP No. 84 of 2003 in OP No. 1075 of 2000' (p.48/66)'

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|---|---|
| ☐ | No financial parameters are used for additionality justification |
| ☒ | Assessment of all financial parameters see below |

| Parameter | Value applied | Unit | Source of Information (please indicate document and page) | Reference | DOE ASSESSMENT | |
|---|---|---|---|---|---|---|
| | | | | | Correctness of value applied | Comment |
| | | | | | | (Tunga Mini Hydel Power Project) to Rs.2 mn./MW (120 MW Rangit IV Hydro power project and 10 MW Manjanadka Hydro Project). Therefore, validation team has accepted this cost as reasonable. In the above background, the O&M cost is considered appropriate for the project activity. |
| Administrative expenditure` | 6.60 | INR mn. | DPR | /DPR/ | ☒ | Administrative expenditure is based on the DPR (p.16). Since this is a standalone project and the O&M cost would take care of only the operations and maintenance of the project, PP has to incur expenditure on office salary, rent for the office, travel & conveyance, printing & stationary, communication etc. This cost has been considered at Rs.550,000 per month, which is considered reasonable based on the sectoral and local expertise of DOE. |
| Escalation in O&M cost | 5.72 | Percent | DPR | /DPR/ | ☒ | Escalation in O&M cost is based on DPR (p.62). The O & M cost escalation at 5.72% is considered reasonable considering the size of the project and the inflationary pressures to which the constituents of O&M cost are subjected to. Validation team also compared the escalation assumed by other projects and observed that |

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|---|---|---|---|---|---|---|
| ☐ | No financial parameters are used for additionality justification | | | | | |
| ☒ | Assessment of all financial parameters see below | | | | | |
| **Parameter** | **Value applied** | **Unit** | **Source of Information (please indicate document and page)** | **Reference** | **DOE ASSESSMENT** | |
| | | | | | **Correctness of value applied** | **Comment** |
| | | | | | | the escalation ranges between 4% and 10%. For example, Someshwara Small Hdyropower project (1273) has assumed 10% escalation; Bhavani Barrage II SHP (2807) has assumed 10% cost escalation; 24.75 MW Ranganathaswamy Mini Hydel project (1345) has assumed 5% escalation; 24 MW Shamburi Mini Hydropower project (2736) has assumed escalation of 4.1%. The escalation considered is within the range. Therefore, validation team reckons this escalation as appropriate for the project activity. |
| Escalation in administrative expenses | 5.00 | percent | DPR | /DPR/ | ☒ | Escalation in administrative expenses is based on DPR (p.16). Since the administrative expenses consist of office salary, rent for the office, travel & conveyance, printing & stationary, communication etc., which are all subject to inflationary pressure and since the country has been experiencing inflation of about 5%[32], the escalation assumed is correct and appropriate. |

[32] Wholesale Price Index during 2008-09 was 233.9 and during 1998-1999 was 140.7. Thus the CAGR works out to 5.21%, rounded off to 5% (data can be accessed at http://rbidocs.rbi.org.in/rdocs/Publications/PDFs/39T_HBSE200910.pdf)

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| ☐ | No financial parameters are used for additionality justification |
| ☒ | Assessment of all financial parameters see below |

| Parameter | Value applied | Unit | Source of Information (please indicate document and page) | Reference | DOE ASSESSMENT | |
|---|---|---|---|---|---|---|
| | | | | | Correctness of value applied | Comment |
| Power Tariff | 3.50 | INR/kWh | DPR and PPA signed with Tata Power Company | /DPR/ /PPA / | ☒ | Tariff is based on the PPA signed with M/s Tata Power Company Ltd. which provides a tariff of Rs.3.50/kWh. This is higher than the tariff recommended by APERC (Rs.2.60/kWh in the first year going down to Rs.1.88/kWh in the 10th year). Further, the tariff rate available as per the PPA signed with TPTC is valid until December 2012 only and there is no guarantee that it will be increased thereafter due to the fact that the generating capacity of Andhra Pradesh is envisaged to go multi forth in the times to come. Thus, the tariff (Rs 3.50/kWh) has been kept constant for the life time of the project activity whilst calculating the financial viability. Moreover, none of the registered IPPs have considered a tariff of even Rs.3/MWh. Hence, validation team considers the tariff appropriate and conservative. |
| MNRE Subsidy | 58 | INR mn. | MNRE subsidy scheme for SHPs | /MNRE/ | ☒ | As per the MNRE scheme of subsidy , SHPs are eligible for subsidy at Rs.12 mn. for the first MW and at Rs.2 mn./MW for subsequent megawatts. Hence, the subsidy works out to Rs. 58 mn. [12+(23*2)]. As per the scheme, 50% of the subsidy will be released at the time of |

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| ☐ | No financial parameters are used for additionality justification |
| ☒ | Assessment of all financial parameters see below |

| Parameter | Value applied | Unit | Source of Information (please indicate document and page) | Reference | DOE ASSESSMENT | |
|---|---|---|---|---|---|---|
| | | | | | Correctness of value applied | Comment |
| | | | | | | implementation and the balance at the end of first year of operation. The subsidy amount has been computed correctly and reckoned appropriately in the financial indicator calculations |
| Term Loan | 1290.48 | INR mn. | DPR | /DPR/ | ☒ | The project is assumed to be funded by term loan of Rs.1290 mn., though IREDA had sanctioned a loan of Rs.1250 mn. only. However, for the purpose of additionality demonstration, term loan had been considered at Rs.1290 mn only. In case the actual loan sanctioned is taken into consideration, IRR will go down by 3 basis points from 12.80% as presented to 12.77%, rendering the project all the more additional. Hence, the interest calculations are conservative from additionality demonstration perspective.<br><br>The project financing pattern yields a gearing of 70:30. In India, infrastructure projects are generally entitled to a debt equity ratio of 70:30, though depending on the case the ratio can be marginally higher or lower. APERC itself recommends a debt equity ratio of 70:30 for small hydro electric power projects. As the debt equity ratio is in |

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| ☐ | No financial parameters are used for additionality justification |
| ☒ | Assessment of all financial parameters see below |

| Parameter | Value applied | Unit | Source of Information (please indicate document and page) | Reference | DOE ASSESSMENT | |
|---|---|---|---|---|---|---|
| | | | | | Correctness of value applied | Comment |
| | | | | | | conformity with the gearing recommended by APERC, the validation team is convinced that the financing pattern assumed is appropriate and correct for the project activity. Consideration of actual gearing achieved (68:32), as stated above, does not render the project non-additional. Hence, the gearing considered is conservative from additionality demonstration point of view. |
| Interest on term loan | 12.15 | Percent | DPR and loan sanction letter | /DPR/ /LOAN/ | ☒ | Interest has been computed based on the loan sanction letter issued by IREDA. This is in conformity with guidance 11 of Annex 58, EB 51, which states that where post tax benchmark is used the DOE shall ensure that *actual interest payable* is taken into account in the calculation of income tax. The interest rate considered in the DPR is also the same Hence the value is correct and appropriate for the project activity |
| Initial moratorium period (from disbursement) | 3 | years | Loan Sanction letter | /LOAN/ | ☒ | Initial moratorium period is based on the loan sanction letter issued by IREDA. This is in conformity with guidance 11 of Annex 58, EB 51, which states that where post tax benchmark is used the DOE shall ensure that *actual interest payable* is taken into account in the calculation of |

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| ☐ | No financial parameters are used for additionality justification |
| ☒ | Assessment of all financial parameters see below |

| Parameter | Value applied | Unit | Source of Information (please indicate document and page) | Reference | DOE ASSESSMENT | |
|---|---|---|---|---|---|---|
| | | | | | Correctness of value applied | Comment |
| | | | | | | income tax. Since actual interest calculation would involve using the initial moratorium period also as per sanction letter, the value is correct and appropriate for the project activity |
| Repayment period | 10 | Years | Loan sanction letter | /LOAN/ | ☒ | Repayment period is based on the loan sanction letter issued by IREDA. This is in conformity with guidance 11 of Annex 58, EB 51, which states that where post tax benchmark is used the DOE shall ensure that *actual interest payable* is taken into account in the calculation of income tax. Since actual interest calculation would involve using the repayment period also as per sanction letter, the value is correct and appropriate for the project activity |
| Refurbishment cost (at 2008 cost level) | 100 | INR mn. | DPR | /DPR/ | ☒ | DPR (p.57) provides for refurbishment cost at Rs.100 mn. (at 2008 price level) in the 11$^{th}$ year of operation. Guidance 3 of Annex 58, EB 51 permits making this provision. Since the DPR provides for this cost and is in conformity with Annex 58, EB 51, the cost is considered appropriate for the project activity. The 5% escalation is considered appropriate as it is the general inflation rate in the country (please refer also to parameter "Escalation in |

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| ☐ | No financial parameters are used for additionality justification |
| ☒ | Assessment of all financial parameters see below |

| Parameter | Value applied | Unit | Source of Information (please indicate document and page) | Reference | DOE ASSESSMENT | |
|---|---|---|---|---|---|---|
| | | | | | Correctness of value applied | Comment |
| | | | | | | administrative expenses" in Annex 3 and footnote 33). |
| Book Depreciation rate | 2.57 | Percent | CERC norms[33] | /CERC/ | ☒ | The project developer has adopted CERC recommended depreciation rate for computing book profit and Income Tax Act stipulated WDV depreciation for income tax calculation, which are accepted accounting methods. Since normally the companies use book depreciation rate as stipulated in Schedule XIV of Companies Act, clarification was sought on the basis of using CERC recommended book depreciation as it impacts additionality. In response, project developer has submitted an undertaking that the company uses CERC recommended depreciation rates in its books. However, validation team thought it appropriate to insert a FAR on the following lines:<br>"*The book depreciation rate used will be monitored during the first verification and in case it is observed that the company has opted for Schedule XIV depreciation instead of CERC recommended depreciation, financial* |

[33] Please see http://cercind.gov.in/Current_reg.html

| | | | | | | |
|---|---|---|---|---|---|---|
| ☐ | No financial parameters are used for additionality justification | | | | | |
| ☒ | Assessment of all financial parameters see below | | | | | |
| **Parameter** | **Value applied** | **Unit** | **Source of Information (please indicate document and page)** | **Reference** | **DOE ASSESSMENT** | |
| | | | | | **Correctness of value applied** | **Comment** |
| | | | | | | *additionality will be revisited"*. |
| IT Depreciation rate<br>- civil works<br>- Plant & machinery | <br>10<br>15 | percent | Income Tax Rules | /IT/ | ☒ | Project developer has taken into account the depreciation for plant and machinery at 15% and for civil works at 10%, which the hydropower project is entitled to under Income Tax Rules (Appendix I). The rates are appropriate for the proejct activity |
| Working capital<br>- Receivables<br>- O&M cost | <br>10<br>15 | Days | Power Purchase Agreement | /PPA/<br>/CERC | ☒ | Since the PPA provides for weekly billing, receivables of 10 days is considered reasonable as the payment will be released within 3 days. O&M cost assumed is conservative to SERC/CERC recommended stocking period. Hence, the values are conservative and appropriate |
| Working capital interest | 12.15 | Percent | Loan sanction letter | /IREDA/ | ☒ | Interest has been computed based on the loan sanction letter issued by IREDA (Clause 4.1). This is in conformity with guidance 11 of Annex 58, EB 51, which states that where post tax benchmark is used the DOE shall ensure that *actual interest payable* is taken into account in the calculation of income tax. The interest rate considered in the DPR is also the same Hence the value is correct and |

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|---|---|---|---|---|---|---|
| ☐ | No financial parameters are used for additionality justification | | | | | |
| ☒ | Assessment of all financial parameters see below | | | | | |
| **Parameter** | **Value applied** | **Unit** | **Source of Information (please indicate document and page)** | **Reference** | **DOE ASSESSMENT** | |
| | | | | | **Correctness of value applied** | **Comment** |
| | | | | | | appropriate for the project activity. |
| Tax rate<br>-MAT<br>-Regular | <br>11.33<br>33.99 | <br>percent | <br>Finance Act 2008-09 | <br>/FA/ | <br>☒ | <br>The tax rate considered pertains to the tax rate prevailing at the time of decision making. The tax rate considered is correct and conforms to Annex 58, EB 51. |
| Benchmark | 14 | Percent | Weekly Statistical Supplement dt. 12/09/2008 | /RBI/ | ☒ | At the time of decision making the PLR (evidenced by publications by the Reserve Bank of India) ranged between 13.25% and 14.00%[34]. PLR represents the commercial lending rate of banks. Therefore, the PLR as benchmark conforms to guidance 12 of Annex 58, EB 51. Moreover, since the PLR is publicly available and can be validated by DOE, it also conforms to guidance 13 of Annex 58, EB 51. PP has chosen the average of the PLR range, viz., 13.63%1 as benchmark. |

[34]. The PLR is sourced from the RBI Weekly Statistical Supplement (Sept. 12, 2008) published by the Reserve Bank of India, which was available to the PP at the time of decision making (i.e., Sept. 15, 2008). The rate can be accessed from http://rbidocs.rbi.org.in/rdocs/Wss/PDFs/86924.pdf This rate pertains to Aug. 29, 2008. The PLR as of Sept 12-19. 2008 can be sourced from Oct. 3, 2008 issue (which was not available to the PP at the time of decision making). There was no change in the PLR subsequently also and that it remained within the same range. Please see http://rbidocs.rbi.org.in/rdocs/Wss/PDFs/87284.pdf.

# ANNEX 4: ASSESSMENT OF BARRIER ANALYSIS

**Table A-4:** Assessment of Barrier Analysis (EB 51 Annex 3, § 117)

Assessment of Barrier Analysis: Barrier analysis is an optional barrier as Tool for demonstration and assessment of additionality. Project participant has taken Investment as the major barrier and than done the common practice analysis as per the requirement of the Tool

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| ☒ | No barrier parameters are used for additionality justification |
| ☐ | Assessment of barriers see below |

| Kind of Barrier (invest, tech, other) | Description of Barrier | Evidence used | Assessment of validation team | |
|---|---|---|---|---|
| | | | Appropriateness of information source | Explanation of final result |
| | | | ☒ | |
| | | | ☒ | |
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# ANNEX 5: OUTCOME OF THE GSCP

**Table A-5:** Outcome of the Global Stakeholder Consultation Process

(§§ 40-42, VVM Version 1.2)

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| ☒ | No comments were received during the global stakeholder consultation period |
| ☐ | Comments were received during the global stakeholder consultation period. The comments (in unedited form) and the consideration/response of the validation team are presented below: |

| Comment No.: | Comment by: | Inserted on: | Subject | Comment *) | Action taken by the validation team to take due account on the comment *) | Conclusion (incl. CARs CLs or FARs) |
|---|---|---|---|---|---|---|
| | **CDM INDIA** | | | Why has the PP estimate the market returns based on a 30 year period? Indian economy underwent significant changes during 1990. Hence the period from 1990 onwards should be considered as a reasonable period. PP may argue saying the longer period is more conservative to take into account market fluctuations, which is not acceptable. PP has considered longer period to calculate a high market return. DOE is requested to | The PP has now revised the IRR calculations and utilized project IRR (refer CL B6 above) in place of Equity IRR. The project IRR has now been compared to a suitable benchmark i.e. Local Commercial Lending rates from RBI. | Since the PP has revised the financial indicator to project IRR and used commercial lending rate as benchmark, the comment has lost its significance. |

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| | | | | justify the vintage considered for calculating the market premium. | | |
| | **CDM INDIA** | | | Why has the PP considered a 3 year period for beta calculation? Why not 5 years or 10 years? | The PP has now revised the IRR calculations and utilized project IRR (refer CL B6 above) in place of Equity IRR. The project IRR has now been compared to a suitable benchmark i.e. Local Commercial Lending rates from RBI. | Since the PP has revised the financial indicator to project IRR and used commercial lending rate as benchmark, the comment has lost its significance. |
| | **CDM INDIA** | | | Why does the PP consider the BSE sensex to be appropriate index as compared to other indices on BSE such as BSE 500 or BSE 200 or BSE 100. Also NSE is another index which could be considered?<br>BSE sensex only contains 30 industries. Is this acceptable? | The PP has now revised the IRR calculations and utilized project IRR (refer CL B6 above) in place of Equity IRR. The project IRR has now been compared to a suitable benchmark i.e. Local Commercial Lending rates from RBI. | Since the PP has revised the financial indicator to project IRR and used commercial lending rate as benchmark, the comment has lost its significance. |
| | M. Thimma | | | Any effort that helps to bring down | Please refer to the response below. | |

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| | Reddy | | | pollution as well as global warming needs to be welcomed. This is particularly the case with renewable energy sources like small hydro power plants. The 24MW Dummagudem small hydro power plant is one such case.<br><br>But caution should be taken to see that the project actually contributes to lessening global warming, that too to the extent that the developers claim.<br><br>The details of this project made available on the site of the UNFCCC gives raise to some doubts about the efficacy of this particular project in addressing global warming. In this note an attempt is made to explain these doubts. | | |
| | M. Thimma Reddy | | | The Government of Andhra Pradesh (GoAP) is going to construct a multipurpose irrigation project on Godavary river at Dummagudem with the coordinates of Longitude: 80-53-15 and Latitude: 17-52-30. It consists of 320 MW hydro electric plant and | The co-ordinates of the main river are as follows.<br><br>Longitude: 80° - 53' - 15”<br>Latitude: 17° – 52' - 30”<br><br>The co-ordinates of our project is as follow. | It has been confirmed that the 320 MW Hydro Electric plant will be on the main river and the water |

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| | | | | a tail pond downstream side of the project. With this multipurpose project there will be no space for the proposed small hydro power project. In fact the existing anicut/barrage will disappear because of the GoAP's multipurpose project and no left flank will be left for the small hydro project. In sum, the proposed 24 MW small hydro power plant by M/S SLS Power Corporation Limited is impracticable. | Longitude: 80° - 53' – 12"<br>Latitude: 17° – 51' - 19"<br><br>The Co-ordinates of the main river and our project site is not the same. | will be discharged back to the river after it is used for power generation. Further, if the scenario mentioned in the stakeholder comment was true, then the project activity would never have received NEDCAP (Non Conventional Energy Development Corporation of Andhra Pradesh Ltd) approval at all. Hence, the question of affecting our project |

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| | | | | | | does not arise. |
| | M. Thimma Reddy | | | The project is being set up on left flank of the existing anicut/barrage that is source of irrigation for the farmers in that area. In order to create a head of 4.8 meters some quantity of water need to be impounded at the anicut/barrage. The farmers will be deprived of this water. Also, as the design of the project shows the water used by the hydro electric plant will be discharged in to the river but not in to the canal. This leads to an apprehension that this project will interfere with irrigation.<br><br>If the farmers are deprived of the irrigation facilities they will be forced to explore for alternative irrigation water supply sources. A look at the Sreeramsagar irrigation project in Godavary basin provides the likely alternatives the farmers will fall back upon to meet their irrigation water needs. Because of silt in the storage area the irrigation capacity of this project declined considerably. The | To create the head of 4.8 mtrs, water is not required to be impounded. Thus, the farmers are not likely to be affected. | The water used by our project will be discharged back into the river by tail race canal. Hence there is no deprivation of water due to our project. Hence, there will not be negative impacts on global warming due to the project activity. |

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| | | | | farmers in this area to overcome this water shortage resorted to electrified bore well irrigation. This electricity is supplied from the grid. In Andhra Pradesh major part of the electricity comes from coal fired thermal power plants. This shows that in the absence of environmentally friendly irrigation farmers have resorted to pumpsets energized by conventional power sources.<br><br>Under Dummagudem anicut/barrage irrigated system also in the absence of regular water supply farmers will be forced to depend on electrified bore wells. Instead of bringing down global warming this project may have opposite impact. This aspect needs to be closely examined. | | |
| | M. Thimma Reddy | | | The document shows that the project in question will be operating at a PLF of 49.18%. This may be on higher side. The Andhra Pradesh Electricity Regulatory Commission (APERC) in its tariff order for renewable energy plants dated 20-03-2004 considered 35% PLF appropriate | The PLF calculations for the project (estimated at 49.18%) is considered from DPR. The same has been considered for the financial additionality and is in line with annex 11, EB48. Further the lower the PLF, higher the risk; Hence, | Project developer has submitted a copy of the DPR which incorporates the estimation of generation (p.35). The report |

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| | | | | as the output of power from mini hydro plants is dictated by irrigation needs (paragraph 66). APERC based this estimate on historical water availability information.<br><br>The above PLF of 49.18% is not possible on other count also. Besides the Dummagudem multipurpose irrigation project with hydro electric plants and tail pond project the GoAP is planning many irrigation projects upstream of Dummagudem on Godavary river as a part of massive irrigation programme called 'Jalayagnam'. Because of these projects in future water availability at Dummagudem will be low and it may not be possible to achieve 49.18% PLF. | | estimates the generation at 103.4 mn. units per annum. This yields a PLF of 49.18%. APERC has recommended PLF of 35%. Since the PLF conforms to the requirements of Annex 11, EB 48, and more than the PLF recommended by APERC, PLF is considered suitable and appropriate for the project activity. |
| | M. Thimma Reddy | | | The Document shows that this 24 MW mini hydro plant's capital cost would be Rs. 184.35 crore. Per MW capital cost would be Rs. 7.68 crore. Here it is to be noted that the APERC in the above mentioned order considered that | It would appear that the project cost at Rs 7.68 Crores/MW appears to be on the higher side. However, the higher cost is on account of the followings:<br><br>• This project is a very low head and high discharge project. | PP's response explains the reasons. Besides, DOE has also requisitioned |

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| | | | | capital cost of Rs. 3.625 crore/MW would be reasonable for small hydro power plants (paragraph 65). The capital cost proposed by the developers if 100% higher than the capital cost approved by the statutory regulator for similar projects. Besides this, the proposed project is being set up on left flank of the existing anicut/barrage. This should considerably bring down capital cost of the plant. | The rated head is 4.8m and the discharge cumecs is very high. Hence the size of the turbine is very big (the runner diameter is 4.2 m).<br><br>• The Turbine Generator consists of the following major assemblies:<br>  • Stayring assembly<br>  • Distributor assembly<br>  • Discharge ring assembly<br>  • Draft tube assembly<br>  • Runner assembly<br>  • Oil tube assembly<br>  • Gear box<br>  • Gear box Lube oil system<br>  • Generator<br>  • Generator Lube oil system<br>  • Cooling water system<br>  • Drainage & Dewatering system<br>  • Compressed air system<br><br>• The increase in size of the runner diameter results in increase in size of Stayring assembly, thus the total weight results in increase in cost. | and obtained an opinion from an expert, which supports the project cost. Hence, the cost is acceptable |

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| | | | | | • The Distributor assembly consists of accurately machined components, profiled components, bronze bush bearings, hydraulic servomotor. The increase in runner diameter results in increase in size of the fabricated, machined and outsourced components resulting in increasing the fabrication cost, machining cost and outsourced components cost which includes bronze components, thus increasing the overall cost of the assembly.<br><br>• The Runner assembly consists of accurately machined components, Stainless steel profiled components, bronze bush bearings, High strength components, etc. The increase in runner diameter increased the weight of these components which results in increase in cost.<br>• Gear box is an expensive part of the turbine. The increase in size of the runner diameter | |

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| | | | | | increases the size of the runner assembly and associated components connected to gearbox. This increases the capacity of the gearbox resulting in increase of gear box cost.<br><br>• The increase in capacity of Generator, Gearbox and size of turbine increase the capacity of auxiliary systems namely cooling water system, Drainage and Dewatering system and Compressed air system, due to which their cost increases.<br><br>• The increase in size and capacity of the above Turbine components and Generator increases the weight to be handled by the EOT crane, thus increasing its rating. Increase in rating of crane results in higher cost of crane.<br><br>• In this project due to the being head very low, pit type turbine had to be chosen. In this type of turbine, due to the lower | |

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| | | | | | setting, the excavation had to done to very low level, thus increasing the excavation cost. Further, in the pit turbines, civil works is very massive as from intake up to the pit, the construction is concrete structure and the turbine metal casing starts beyond the pit.<br><br>Hence, the cost of civil works is very high, adding to the overall project cost. | |
| | M. Thimma Reddy | | | In this Document at one place (A.2) it was mentioned that this plant did not involve the construction of a dam and therefore no negative impacts. At another place in the same document (B.2 (4)) it was mentioned that the project activity would result in new reservoir. Rated head of the project is 4.8 meters. This contradiction in the claims of the Document needs to be examined. | The statement in section B.2 of the PDD was an error and has now been corrected. The applicability criteria clearly states that project activities with a power density greater than $4W/m^2$ are eligible for CDM and our project falls under this criteria. | |
| | M. Thimma Reddy | | | From the Document it appears that the project in question has not obtained clearance from the Ministry of Forests and Environment of Government of India. | Please refer Section D/E of the PDD. All the relevant clearances have been applied for and copies of the same will be provided to the DOE. The project also applied for Host Country Approval (as per CDM rules) and this was | OK |

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| | | | | | received on 18th August 2010. | |
| | **Kancharla raghu** | | | The 24 MW Dummagudem hydro project of SLS Power Corporation Limited is located on river Godavari at Longitute 80-3-12 & Latitude 17-51-19. However the Government of Andhra Pradesh is contemplating construction of a multipurpose dam and a Hydro Power Project with a capacity of 320MW on river Godavari at a location with coordinates- Longitude: 80-53-15 & Latitude: 17-52-30. Thus it is very clear that the proposed Dummugudem multipurpose dam and hydel project by the Government of Andhra Pradesh falls at the very location where the 24 MW hydro project of M/S SLS Power Corporation is contemplated. Also Government of Andhra Pradesh contemplates construction of tail pond dam down stream of above dam. Thus, both the multipurpose dam and tail pond dam by the Government of Andhra Pradesh, at the above locations, make the proposed 24 MW Dummagudem hydro project of SLS Power | The co-ordinates of the main river are as follows.<br><br>Longitude: 80° - 53' - 15”<br>Latitude: 17° – 52' - 30”<br><br>The co-ordinates of our project is as follow.<br><br>Longitude: 80° - 53' – 12”<br>Latitude: 17° – 51' - 19” | The Co-ordinates of the main river and our project site is not the same. The 320 MW Hydro Electric plant will be on the main river and the water will be discharged back to the river after it is used for power generation. Further, if the scenario mentioned in the stakeholder comment was true, then the project activity would never have |

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| | | | | Corporation Limited impracticable. Hence the very existence of this project becomes questionable. This aspect needs to be examined. | | received NEDCAP (Non Conventional Energy Development Corporation of Andhra Pradesh Ltd) approval at all. Hence, the question of affecting our project does not arise. |
| | **Kancharla raghu** | | | One more important issue that needs to be examined is that the Government of Andhra Pradesh is also contemplating construction of large scale multipurpose projects at various locations upstream of proposed 24 MW Dummagudem hydro project of M/S SLS Power Corporation Limited, viz. Dam at Kanthanapally, Warangal District, Pranahita-Chevella Lift irrigation scheme, Yellampally lift irrigation scheme etc,. The impact of all these projects on viability of | As mentioned in the response above, the installation of larger projects upstream would not significantly affect our project activity. | |

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| | | | | proposed 24 MW Dummugudem hydro project by M/S SLS Power Corporation Limited needs to be examined. | | |
| | **Kancharla raghu** | | | The cost of the 24 MW hydel project is shown as Rs 184.35 cr, which is very high compared to the normative capital cost of mini hydel power projects approved by the Andhra Pradesh Electricity Regulatory Commission based on its study on capital costs of various mini hydel power projects in Andhra Pradesh. As the project capacity of M/S SLS Power Corporation Limited is 24 MW, which is much higher that standard mini hydel power projects, the overall capital cost should have been less, taking into account economy of scales. This aspect needs to be examined. | It would appear that the project cost at Rs 7.68 Crores/MW appears to be on the higher side. However, the higher cost is on account of the followings:<br>• This project is a very low head and high discharge project. The rated head is 4.8m and the discharge cumecs is very high. Hence the size of the turbine is very big (the runner diameter is 4.2 m).<br>• The Turbine Generator consists of the following major assemblies:<br>◦ Stayring assembly<br>◦ Distributor assembly<br>◦ Discharge ring assembly<br>◦ Draft tube assembly<br>◦ Runner assembly<br>◦ Oil tube assembly<br>◦ Gear box<br>◦ Gear box Lube oil | PP's response explains the reasons. Besides, DOE has also requisitioned and obtained an opinion from an expert, which supports the project cost. Hence, the cost is acceptable |

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| | | | | | system<br>• Generator<br>• Generator Lube oil system<br>• Cooling water system<br>• Drainage & Dewatering system<br>• Compressed air system<br><br>• The increase in size of the runner diameter results in increase in size of Stayring assembly, thus the total weight which results in increase in cost.<br><br>• The Distributor assembly consists of accurately machined components, profiled components, bronze bush bearings, hydraulic servomotor. The increase in runner diameter results in increase in size of the fabricated, machined and outsourced components resulting in increasing the fabrication cost, machining cost and outsourced components cost which includes bronze components, | |

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| | | | | | thus increasing the overall cost of the assembly.<br><br>• The Runner assembly consists of accurately machined components, Stainless steel profiled components, bronze bush bearings, High strength components, etc. The increase in runner diameter increased the weight of these components which results in increase in cost.<br>• Gear box is an expensive part of the turbine. The increase in size of the runner diameter increases the size of the runner assembly and associated components connected to gearbox. This increases the capacity of the gearbox resulting in increase of gear box cost.<br><br>• The increase in capacity of Generator, Gearbox and size of turbine increase the capacity of auxiliary systems namely cooling water system, Drainage and Dewatering system and Compressed air | |

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| | | | | | system, due to which their cost increases.<br><br>• The increase in size and capacity of the above Turbine components and Generator increases the weight to be handled by the EOT crane, thus increasing its rating. Increase in rating of crane results in higher cost of crane.<br><br>• In this project due to the being head very low, pit type turbine had to be chosen. In this type of turbine, due to the lower setting, the excavation had to done to very low level, thus increasing the excavation cost. Further, in the pit turbines, civil works is very massive as from intake up to the pit, the construction is concrete structure and the turbine metal casing starts beyond the pit.<br><br>Hence, the cost of civil works is very high, adding to the overall project cost. | |

*) In case clarifications have been requested by the validation team corresponding rows shall be added

# ANNEX 6: STATEMENTS OF COMPETENCE OF ALL INVOLVED PERSONNEL

TÜV NORD

**CERTIFICATE OF APPOINTMENT**

**Mr. Manojkumar Borekar**

born on 1979-10-14

satisfies the requirements as specified in the TÜV NORD JI/CDM CP directives and is hereby appointed as

**TÜV NORD CDM Senior Assessor**

The present appointment will terminate on 2012-12-03
Certification registration No. 09 12 02 -38

Essen, 2009-12-04

Head of TÜV NORD JI/CDM Certification Program
of TÜV NORD CERT GmbH

TÜV NORD

***Statement of Competence***

Appointment and authorization according to the procedures of the TÜV NORD JI/CDM Cert Senior Program

**Mr. Prasad Jakkaraju**

| SCHEME | STATUS | VALID UNTIL |
|---|---|---|
| CDM | Lead Assessor | 2014-02-02 |
| VCS | Lead Assessor | 2014-02-02 |

Authorization status for technical areas within sectoral scopes

| CODE | TECHNICAL AREA |
|---|---|
| 1.2 | Renewable Energies |
| 2.1 | Electricity Distribution |

103 – Rev. 0, Date: 2011-03-25

TÜV NORD

**CERTIFICATE OF APPOINTMENT**

**Mr. Jimmy Sah**

born on 1984-12-21

satisfies the requirements as specified in the TÜV NORD JI/CDM CP directives and is hereby appointed as

**TÜV NORD CDM Lead Assessor**

The present appointment will terminate on 2014-02-03
Certification registration No. 11 02 03 – 91 rev1

Essen, 2011-02-04

Head of TÜV NORD JI/CDM Certification Program
of TÜV NORD CERT GmbH

TÜV NORD

**CERTIFICATE OF APPOINTMENT**

**Mr. Sukanta Das**

born on 1983-12-10

satisfies the requirements as specified in the TÜV NORD JI/CDM CP directives and is hereby appointed as

**TÜV NORD CDM Lead Assessor**

The present appointment will terminate on 2014-03-08
Certification registration No. 11 03 01 – 89 rev1

Essen, 2011-03-09

Head of TÜV NORD JI/CDM Certification Program
of TÜV NORD CERT GmbH

TÜV NORD

**CERTIFICATE OF APPOINTMENT**

**Ms. Sabine Meyer**

born on 1976-07-05

satisfies the requirements as specified in the TÜV NORD JI/CDM CP directives and is hereby appointed as

**TÜV NORD JI/CDM Assessor**

The present appointment will terminate on 2013-10-27

Certification registration No. 10 10 06 – 197 rev1

Essen, 2010-10-28

Head of TÜV NORD JI/CDM Certification Program of TÜV NORD CERT GmbH

TÜV NORD

***Statement of Competence***

**Mr. Ingo Klein**

| SCHEME | STATUS | VALID UNTIL |
|---|---|---|
| CDM Validation/Verification | Lead Assessor | 2013-10-17 |
| VCS | Lead Assessor | 2013-10-17 |

| CODE | TECHNICAL AREA |
|---|---|
| 1.2 | Renewable Energies |

TÜV NORD

**CERTIFICATE OF APPOINTMENT**

**Mr. Martin Saalmann**

born on 1976-02-23

satisfies the requirements as specified in the TÜV NORD JI/CDM CP directives and is hereby appointed as

**TÜV NORD JI/CDM Senior Assessor**

The present appointment will terminate on 2013-03-31

Certification registration No. 10 04 01 – 22

Essen, 2010-04-01

Head of TÜV NORD JI/CDM Certification Program of TÜV NORD CERT GmbH