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# Validation Report

**KOMMUNALKREDIT PUBLIC CONSULTING**  
**VALIDATION OF THE CDM-PROJECT:**  
**SMALL-SCALE HYDROPOWER**  
**PROJECT SAHANIVOTRY IN MADAGASCAR**

REPORT NO. 1182342

**25<sup>th</sup> March 2010**

TÜV SÜD Industrie Service GmbH  
Carbon Management Service  
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Industrie Service

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**Subject:** Validation of the CDM Project Sahanivotry Hydro Power Plant, Madagascar

<b>Accredited TÜV SÜD Unit:</b> TÜV SÜD Industrie Service GmbH Certification Body "climate and energy" Westendstr. 199 80686 Munich Germany	<b>TÜV SÜD Contract Partner:</b> TÜV Italia srl Industrie Service Via Carducci 125 Ed. 23 20099 Sesto San Giovanni (MI) ITALY
<b>Project Participant(s):</b> Hydelec 15, Avenue de l'Indépendance Analakely Antananarivo Madagascar  Kommunalkredit Public Consulting GmbH Tuerkenstrasse 9 Vienna Austria	<b>Project Site(s):</b> Sahanivotry, Vakinankaratra, Antananarivo Madagascar  GPS coordinates:  longitude: 47°08' E latitude: 20°12' N

**Project Title:** Small-Scale Hydropower Project Sahanivotry in Madagascar

<b>Applied Methodology / Version:</b>	AMS-I.D version 13	<b>Scope(s):</b>	1
		<b>Technical Area(s):</b>	1.1

<b>First PDD Version (GSP):</b> Date of issuance: 13-05-2008 Version No.: 01 Starting Date of GSP 17-05-2008	<b>Final PDD version:</b> Date of issuance: 27-01-2010 Version No.: 03
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<b>Estimated Annual Emission Reduction:</b>	44,196 tCO <sub>2</sub> e
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<b>Assessment Team Leader:</b> Martin Schröder  <b>Assessment Team Members:</b> Luciano Grugni Riccardo Arena  <b>Trainees:</b> -	<b>Responsible Certification Body Members:</b> Thomas Kleiser
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**Summary of the Validation Opinion:**

- ☒ The review of the project design documentation and the subsequent follow-up interviews have provided TÜV SÜD with sufficient evidence for the determination of the project's fulfilment of all stated criteria. In our opinion, the project meets all relevant UNFCCC requirements for the CDM. Therefore, TÜV SÜD recommends the project for registration by the CDM Executive Board if the letters of approval of all Parties involved will be available before the expiring date of the applied methodology(ies) or the applied methodology version respectively.
- ☐ The review of the project design documentation and the subsequent follow-up interviews have not provided TÜV SÜD with sufficient evidence for the determination of the project's fulfilment of all stated criteria. Therefore, TÜV SÜD will not recommend the project for registration by the CDM Executive Board and will inform the project participants and the CDM Executive Board of this decision.

## Abbreviations

<b>ACM</b>	Approved Consolidated Methodology
<b>AM</b>	Approved Methodology
<b>AMS</b>	Approved Methodology Small scale
<b>BM</b>	Build Margin
<b>CAR</b>	Corrective Action Request
<b>CDM</b>	Clean Development Mechanism
<b>CDM EB</b>	CDM Executive Board
<b>CER</b>	Certified Emission Reduction
<b>CM</b>	Combined Margin
<b>CMP</b>	Conference of the Parties serving as the Meeting of the Parties to the Kyoto Protocol
<b>CR / CL</b>	Clarification Request
<b>DNA</b>	Designated National Authority
<b>DOE</b>	Designated Operational Entity
<b>EF</b>	Emission Factor
<b>EIA / EA</b>	Environmental Impact Assessment / Environmental Assessment
<b>ER</b>	Emission Reduction
<b>FAR</b>	Forward Action Request
<b>FSR</b>	Feasibility Study Report
<b>GHG</b>	GreenHouse Gas(es)
<b>IPCC</b>	Intergovernmental Panel on Climate Change
<b>IRL</b>	Information Reference List
<b>IRR</b>	Internal Rate of Return
<b>KP</b>	Kyoto Protocol
<b>MP</b>	Monitoring Plan
<b>NGO</b>	Non Governmental Organisation
<b>OM</b>	Operational Margin
<b>PDD</b>	Project Design Document
<b>PP</b>	Project Participant
<b>TÜV SÜD</b>	TÜV SÜD Industrie Service GmbH
<b>UNFCCC</b>	United Nations Framework Convention on Climate Change
<b>VVM</b>	Validation and Verification Manual

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Annex 1: Validation Protocol

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## 1 INTRODUCTION

### 1.1 Objective

The objective of the validation process is to provide an independent assessment, by a third party (Designated Operational Entity = DOE), of a proposed project activity. The assessment involves the evaluation of the project basis and design identified in the Project Design Document (PDD) using the defined criteria outlined by the registration under the Clean Development Mechanism (CDM). Validation is part of the CDM project cycle and results in a conclusion by the executing DOE on whether a project activity is valid to be submitted for registration to the CDM Executive Board (CDM-EB). The ultimate decision on the registration of a proposed project activity rests with the CDM-EB and the Parties involved.

The project addressed in this validation report has been submitted under the project title:  
Small-Scale Hydropower Project Sahanivotry in Madagascar.

### 1.2 Scope

The scope of any assessment is defined by the underlying legislation, regulation and guidance given by relevant entities or authorities. In the case of CDM project activities, the scope is set by:

- The Kyoto Protocol, in particular § 12 and modalities and procedures for the CDM
- Decision 2/CMP1 and Decision 3/CMP.1 (Marrakech Accords)
- Further COP/MOP decisions with reference to the CDM (e.g. decisions 4 – 8/CMP.1)
- Decisions and specific guidance outlined by the EB which are published under <http://cdm.unfccc.int>
- Guidelines for Completing the Project Design Document (CDM-PDD), and the Proposed New Baseline and Monitoring Methodology (CDM-NM)
- Baselines and monitoring methodologies (including GHG inventories)
- Management systems and auditing methods
- Environmental issues relevant to the sectoral scope applied for
- Applicable environmental and social impacts, and aspects of CDM project activity
- Sector specific technologies and their applications
- Current technical and operational knowledge of the specific sectoral scope and information on best practice

The validation process is not meant to provide any form of consulting for the project participant (PP). However, stated requests for clarifications, corrective actions, and/or forward actions may provide input for improvement of the project design.

Once TÜV SÜD receives a first PDD version, it is made publicly available on the UNFCCC website and on TÜV SÜD's website, which initiates a 30 days global stakeholder consultation process (GSP). In special circumstances, such as when certain conditions allow the GSP to be repeated, a request to revise the PDD will be processed. The original PDD and the modified PDD form the basis for the final evaluation. Information on both PDD's is presented on page 1 of this report.

The purpose of a validation is its use to demonstrate compliance/ non-compliance of the projects with all stated and valid CDM requirements. Additionally the purpose of validation is also to help enable the registration of CDM projects which in turn is only a part of the total CDM project cycle. Therefore, TÜV SÜD cannot be held liable by any party for decisions made, or not made, based on the validation opinion, which will go beyond this purpose.

## 2 METHODOLOGY

The project assessment is based on the “Clean Development Mechanism Validation and Verification Manual” version 1 and is conducted using standard auditing techniques to assess the correctness of the information provided by the project participants. Before the assessment begins, members of the team covering the technical scope(s), sectoral scope(s) and relevant host country experience for evaluating the CDM project activity are appointed. Once the project is made available for the stakeholder consultation process, members of the team carry out the desk review, follow-up actions, resolution of issues identified, and finally the preparation of the validation report. The prepared validation report and other supporting documents then undergo an internal quality control by the CB “climate and energy” before being submitted to the CDM-EB.

In order to ensure transparency, assumptions must be clear and explicitly stated and background material must also be clearly referenced. TÜV SÜD developed a methodology-specific protocol customized for the project. The protocol demonstrates, in a transparent manner, the project criteria (requirements), discussion on each criterion by the assessment team, and the results from validating the identified criteria.

The validation protocol serves the following purposes:

- The organization of details and provision of clarifications on the requirements a CDM project is expected to meet;
- Transparency of the validation process where the validator has to document how a particular requirement has been validated, as well as the results of the validation and any adjustments, if any, made to the project design.

The validation protocol consists of three tables. The different columns in these tables are described in the tables below.

Validation Protocol Table 1: Conformity of Project Activity and PDD				
Checklist Topic / Question	Reference	Comments	PDD in GSP	Final PDD
<i>The checklist is organised in sections following the arrangement of the applied PDD version. Each section is then further sub-divided. The lowest level constitutes a</i>	<i>The section gives reference to documents in which the answer to the checklist question or item is found in</i>	<i>The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached. In some cases sub-checklists are</i>	<i>The section is used to present conclusions based on the assessment of the first PDD version. The PDD is either acceptable based on evidence provided <input checked="" type="checkbox"/> or a <b>Corrective Action Request (CAR)</b> is issued due to non-compliance with the checklist question (See below). <b>Clarification Request (CR)</b> is used when the validation team</i>	<i>In this section, conclusions are presented in the same manner based on the assessment of the final PDD version and further documents including assumptions presented in the documentation.</i>

<i>checklist question / criterion.</i>	<i>case the comment refers to documents other than the PDD.</i>	<i>applied indicating yes/no decisions on the compliance with the stated criterion. Any <b>Request</b> has to be substantiated within this column.</i>	<i>has identified a need for further clarification. <b>Forward Action Request</b> is issued to highlight issues related to project implementation that require review during the first verification.</i>	
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Validation Protocol Table 2: Resolution of Corrective Action and Clarification Requests			
Clarifications and corrective action requests	Ref. to table 1	Summary of project owner response	Validation team conclusion
<i>If the conclusions from table 1 are either a Corrective Action, a Clarification or a Forward Action Request, these should be listed in this section.</i>	<i>Reference to the checklist question number in Table 1 where the issue is explained.</i>	<i>The responses given by the client or other project participants during communication with the validation team should be summarised in this section.</i>	<i>This section should summarise the discussion on and revision to project documentation together with the validation team's responses and final conclusions. The conclusions should be reflected in Table 1, under "Final PDD".</i>

In case of a denial of the project activity more detailed information on this decision will be presented in Table 3.

Validation Protocol Table 3: Unresolved Corrective Action and Clarification Requests		
Clarifications and corrective action requests	Id. of CAR/CR	Explanation of the Conclusion for Denial
<i>If the final conclusions from table 2 results in a denial, the referenced request should be listed in this section.</i>	<i>Identifier of the Request.</i>	<i>This section should present a detailed explanation on why the project is finally considered not to be in compliance with a criterion providing a clear reference to the requirement which is not complied with.</i>

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

## 2.1 Appointment of the Assessment Team

According to the technical scopes and experiences in the sectoral or national business environment, TÜV SÜD has composed a project team in accordance with the appointment rules of the TÜV SÜD certification body "climate and energy". The composition of an assessment team has to be approved by the Certification Body (CB) to assure that the required skills are covered by the team. The CB TÜV SÜD operates four qualification levels for team members that are assigned by formal appointment rules:

- Assessment Team Leader (ATL)
- Greenhouse Gas Auditor (GHG-A)
- Greenhouse Gas Auditor Trainee (T)
- Experts (E)



It is required that the sectoral scope/s and the technical area/s linked to the methodology and project have to be covered by the assessment team.

Name	Qualification	Coverage of scope	Coverage of technical area	Host country experience
<b>Martin Schröder</b>	ATL			<input checked="" type="checkbox"/>
Luciano Grugni	GHG-A	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Riccardo Arena	GHG-A	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	

**Mr. Martin Schröder** is an Assessment Team Leader appointed by the certification body "climate and energy" of TÜV SÜD. Within the Carbon Management Service he is responsible for the validation and verification of forestry based mitigation projects. He holds a master degree in tropical forest science and passed successfully internal training schemes in the field of auditing. Before entering the company, he worked in the field of natural resource management as well as voluntary carbon offset projects.

**Mr. Luciano Grugni** is an auditor for environmental management systems and JI/CDM at the department "Climate, Energy and Environment" of the Italian branch of TÜV SÜD Group. He has been involved in the topic of environmental auditing, monitoring and verification due to the requirements of the Kyoto Protocol. His main focus lies on emissions trading audits and renewable energies.

**Mr. Riccardo Arena** is an auditor for environmental management systems at the department "Climate, Energy and Environment" of the Italian branch of TÜV SÜD Group. He holds a Master Degree in Environmental Engineering and a post degree course in International Development Cooperation and Project Design. He has been involved in the topic of environmental auditing, monitoring and verification due to the requirements of the Kyoto Protocol.

## 2.2 Review of Documents

The first version of the PDD was submitted to the DOE in May 2008. The first PDD version submitted by the PP and additional background documents related to the project design and baseline have been reviewed to verify the correctness, credibility, and interpretation of the presented information. Furthermore, a cross-check between information provided and information from other sources (if available) has been done as an initial step of the validation process. A complete list of all documents and evidence material reviewed is attached as annex 2 to this report.

## 2.3 Follow-up Interviews

On the 20th May 2008 TÜV SÜD performed interviews, telephone conferences, and physical site inspections with project stakeholders to confirm relevant information, and to resolve issues identified in the first document review. The table below provides a list of all persons interviewed in this process.

Name	Function and Organisation	
Elvira Lutter	CDM consultant	Pöyry Energy GmbH
Jean Pierre Sanchis	Director	Hydelec Madagascar SA
André Fillet	President and CEO	Hydelec Madagascar SA
Michel Gerard	Civil Engineer	Hydelec Madagascar SA



Malala Randriamifidimanana	DAF	Hydelec Madagascar SA
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## 2.4 Further cross-check

During the validation process the team has made reference to available information related to similar projects or technologies as the CDM project activity. Project documentation has also been reviewed against the approved methodology/ies applied to confirm the appropriateness of formulae and correctness of calculations.

## 2.5 Resolution of Clarification and Corrective Action Requests

The objective of this phase of the validation is to resolve the requests for corrective actions, clarifications, and any other outstanding issues which needed to be clarified for TÜV SÜD's conclusion on the project design. The CARs and CRs raised by TÜV SÜD were resolved during communication between the client and TÜV SÜD. To guarantee the transparency of the validation process, the concerns raised and responses that have been given are documented in more detail in the validation protocol in annex 1.

The final PDD version submitted January 2010 serves as the basis for the final assessment presented. Further changes to the project during the validation process are not considered to be significant with respect to the main CDM objectives. The two CDM main objectives are the reduction of anthropogenic GHG emissions and the contribution to the host country sustainable development.

## 2.6 Internal Quality Control

Internal quality control is the final step of the validation process and involves the internal quality control by the CB "climate and energy" of the final documentation, which includes the validation report and annexes. The completion of the quality control indicates that each report submitted has been approved either by the head of the CB or the deputy (a veto person can be used if necessary). In projects where either the Head of the CB or his/her deputy is part of the assessment team, the approval is given by the one not serving on the project.

After confirmation by the PP, the validation opinion and relevant documents are submitted to the EB through the UNFCCC web-platform.

### **3 SUMMARY**

The assessment work and the main results are described below in accordance with the VVM reporting requirements. The reference documents indicated in this section and annex 1 are stated in annex 2.

#### **3.1 Approval**

The project participants are Hydelec Madagascar of Madagascar and Kommunalkredit Public Consulting of Republic of Austria. The host Party Madagascar and further participant Parties Republic of Austria meet the requirements to participate in the CDM.

The DNA of the Austria issued a LoA (IRL 20) on 02<sup>nd</sup> February 2010 authorizing Kommunalkredit Public Consulting as a project participant. The DNA of Madagascar also issued a LoA (IRL 42) on 04 November 2009 authorizing Hydelec Madagascar as a project participant. TÜV SÜD received these letters from the project participants directly and considers the provided letters as authentic.

Furthermore, after checking the provided LoAs, TÜV SÜD confirms that both letters refer to the precise proposed CDM project activity title in line with the title in the PDD “Sahanivotry Hydro Power Plant, Madagascar”.

Both letters also indicate that each participating Party is a Party to the Kyoto Protocol, and that the participation in the Sahanivotry Hydro Power Plant, Madagascar project is voluntary. The LoA of Madagascar also confirms that the proposed CDM project activity contributes to the sustainable development of Madagascar (host country). Based on the information given in these letters, TÜV SÜD considers the approval as unconditional with respect to these items.

Both LoAs have been issued by the respective Party's DNA, Ministry of Environment and Forests and The Australian Government Department of the Environment, respectively.

TÜV SÜD therefore considers that the requirements of VVM (§§ 45-48) have been met.

The LoAs do not refer to a specific version of the PDD or validation report. The corresponding references included to LoAs, PDD and validation report are consistent.

#### **3.2 Participation**

The participants of the project activity have been approved by the corresponding Parties, which is confirmed by the issued LoAs.

The means of validation used are similar to the ones described in section 3.1, specifically in regard to the approval process of the project activity.

#### **3.3 Project design document**

The PDD is compliant with relevant form and guidance as provided by UNFCCC.

The most recent version of the PDD form was used.

TÜV SÜD considers that the guidelines for the completion of the PDD in their most recent version have been followed. Relevant information was provided by the participants in the applicable PDD sections. Completeness was assessed through the checklist included in annex 1 of this report.

#### **3.4 Project description**

The following description of the project as per PDD was verified during the on-site audit:

Sahanivotry Hydro Power Plant (hereafter referred to as “SHPP”), Madagascar is a run-of-river hydropower plant. With a capacity of 15 MW, the designed annual power output is 80,650 MWh. The plant will be connected to the substation of the regional grid of Antananarivo (hereafter referred to as RITANA) operated by JIRAMA. The estimated annual emission reduction amounts to 44,196 t CO<sub>2e</sub>.

The information presented in the PDD on the technical design is consistent with the actual planning and implementation of the project activity as confirmed by:

- The review and cross check of data and information (see annex 2).
- An on-site visit which has been performed. Relevant stakeholder and personnel with knowledge of the project were interviewed. In case of doubt, further cross checks through additional interviews were conducted.
- Information related to similar projects or technologies which have been used to validate the accuracy and completeness of the project description.

In conclusion, TÜV SÜD confirms that the project description, as included in the PDD, is sufficiently accurate and complete in order to comply with the requirements of the CDM.

## 3.5 Baseline and monitoring methodology

### 3.5.1 Applicability of the selected methodology

Compliance with each applicability condition as listed in the chosen baseline and monitoring methodology AMS-I.D Version 13 has been demonstrated.

The assessment was carried out for each applicability criteria and included, among other checks, the compliance check of the local project setting with the applicability conditions in regard to baseline setting and eligible project measures. This assessment also included the review of secondary sources, which further demonstrate that applicability conditions have been complied with.

The methodology specific protocol, included in the annex 1, documents the assessment process.

The protocol also includes the steps taken in the assessment process. The results of the compliance check as well as relevant evidence are detailed in annex 1.

TÜV SÜD confirms that the chosen baseline and monitoring methodology is applicable to the project activity.

Emission sources, which are not addressed by the applied methodology, and which are expected to contribute more than 1% of the overall expected average annual emission reductions, have not been identified.

### 3.5.2 Project boundary

The project boundary was assessed considering information gathered from the physical site inspection, interviews, and secondary evidence received on the design of the project.

As indicated in the methodology AMS-I.D (Version 13), 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, which was correctly identified as the RI TANA grid.

Relevant documentation assessed to confirm the project boundary are listed below:

- Grid connection and meters diagram (IRL 25);
- “Contrat d’achat d’énergie” (IRL 20)

Details and/or observations, are listed in annex 1.

Therefore, TÜV SÜD confirms that the identified boundary, the selected sources, and gases as documented in the PDD are justified for the project activity and are fully in line with the requirements set by the applied methodology.

### 3.5.3 Baseline identification

The PDD defines the following baseline scenario:

As per the AMS-I.D (Version 13) methodology, the baseline is clearly defined for this type of project activity (i.e. installation of a new grid-connected renewable hydro power plant) as following: electricity delivered to the grid by the project activity would have otherwise been generated by the operation of power plants connected to the regional grid (RI TANA).

The information presented in the PDD has been validated by an initial document review of all data. Further confirmation has been made based on the on-site visit and researched information from similar projects and/or technologies. The sources referenced in the PDD have been quoted correctly. The information was verified against credible sources, such as:

- Least Cost Development Plan for the grid hydropower Projects and other Energy Sources (IRL 33); the document provides a clear depiction of the opportunities for hydro and thermal power generation and of other renewable electricity sources.

TÜV SÜD has determined that no reasonable alternative scenario has been excluded.

Based on the validated assumptions used for project activity calculations, TÜV SÜD considers that the identified baseline scenario is reasonable.

Taking the definition of the baseline scenario into account, TÜV SÜD confirms that all relevant CDM requirements, including relevant and/or sectoral policies and circumstances, have been identified correctly in the project PDD.

A verifiable description of the baseline scenario has been included in the PDD.

In regard to item 86 of VVM, TÜV SÜD confirms that:

1. All the assumptions and data used by the project participants are listed in the PDD, including their references and sources;
2. All documentation used is relevant for establishing the baseline scenario and correctly quoted and interpreted in the PDD;
3. Assumptions and data used in the identification of the baseline scenario are justified appropriately, supported by evidence, and can be deemed reasonable;
4. Relevant national and/or sectoral policies and circumstances are considered and listed in the PDD;
5. The approved baseline methodology has been correctly applied to identify the most reasonable baseline scenario, and the identified baseline scenario reasonably represents what would occur in the absence of the proposed CDM project activity.

### 3.5.4 Algorithm and/or formulae used to determine emission reductions

TÜV SÜD has assessed the calculations of baseline emission, and emission reductions. Corresponding calculations were carried out based on calculation spreadsheets. The parameters and equations presented in the PDD, as well as other applicable documents, have been compared with the information and requirements presented in the methodology and respective tools. The equation comparison has been made explicitly following all the formulae presented in the calculation files.

The assumptions and data used to determine the emission reductions are listed in the PDD and all the sources have been checked and confirmed.

Based on the information reviewed it can be confirmed that the sources used are correctly quoted and interpreted in the PDD.

The values presented in the PDD are considered reasonable based on the documentation and references reviewed and the results of the interviews.

The baseline methodology has been correctly applied according to requirements.

The estimate of the baseline emissions can be confirmed as the same baseline emissions results have been replicated by the audit team using the information provided.

Detailed information on the verification of the parameters used in the equations can be found in annex 1. The algorithms for the determination of the baseline, project, and leakage are discussed in the following sections.

### **3.5.4.1 Baseline Emissions**

The baseline emissions factors calculation has been based on the “Tool to calculate the emission factor for an electricity system” (version 01.1).

The operating margin emission factor ( $EF_{OM} = 0.518 \text{ tCO}_2/\text{MWh}$ ) was determined based on the simple adjusted OM method. The ex-ante option was chosen for this calculation, based on the three years period 2004 – 2006; in particular  $EF_{OM}$  has been calculated on the basis of data of fuel consumption and net electricity generation of each power plant/unit part of part of the project boundary (RI TANA). The calculation of the build margin emission factor ( $EF_{BM} = 0.579 \text{ tCO}_2/\text{MWh}$ ) makes use of the data available for the set of power capacity additions in the electricity system that comprises 20% of the net power generation of RI TANA and that have been most recently built; this choice has been confirmed as reasonable as, according to the available data, the chosen set of power units comprises the larger annual generation.

The value for the combined margin emission factor ( $EF_{CM} = 0.548 \text{ tCO}_2/\text{MWh}$ ) was determined using the weighted average of the  $EF_{BM}$  and  $EF_{OM}$  using the default values for the factors as described in the methodology (i.e. 0.5 for hydro plants).

The assessment team has checked the data source from Jirama (IRL 25) and the baseline calculation spreadsheet. It's confirmed that formulae are in compliance with the applicable Tool and that no mistakes were found. In addition the data used (RI TANA data up to 2007, IRL 25) were the last available data at the commencement of the validation (May 2008).

### **3.5.5 Project emissions**

As indicated by the applied methodology, this type of project does not consider project emissions, since the minimum required power density is above the threshold.

### **3.5.6 Leakage**

Not applicable as neither energy generating equipment is transferred from another activity nor existing equipment is transferred to another activity.

### **3.5.7 Emission Reductions**

In summary, the calculation of the baseline emissions (and the correspondent emission reductions), can be considered as correct.

## **3.6 Additionality**

The additionality of the project has been presented in the PDD by applying a combination of investment barrier analysis and other barriers, in line with Attachment A to Appendix B of the simplified modalities and procedures for CDM small-scale project activities; in particular the project presents

an Investment Barrier Analysis and a series of other barriers related to critical financing, policy and capacity. The approach used in the PDD has been assessed initially through the document review, during which the following documents were reviewed:

- Investment Analysis Calculation - project IRR (IRL 39);
- African Development Bank 2006 Financial Model (IRL 41);

On site, the additionality was discussed principally with Mr. Jean Pierre Sanchis, director of Hydelec Madagascar. Further documents have been reviewed on-site (annex 2).

Finally, the data, rationales, assumptions, justifications, and documentation provided have been verified using local knowledge as well as sectoral and financial expertise. This information was also confirmed through the following documentation:

- Proposal for Developing the hydropower plant Sahanivotry under the CDM (IRL 5);
- Letter of no objection from the Madagascar DNA (IRL 6);
- Projected annual electricity generation by AfDB (IRL 34);
- Bank Loan Agreement (IRL 22).

Based on these validation steps we can confirm that the documentation assessed is appropriate for this project.

### 3.6.1 Prior consideration of the clean development mechanism

The starting date of the project activity is determined by the purchasing contract of turbines and generator in April 2007. In order to corroborate this information, the assessment team has reviewed the following documents:

- Starting construction evidence, dated March 19<sup>th</sup>, 2007 (IRL 44);
- Purchasing Contract for Turbine and Generator between dated April 24<sup>th</sup>, 2007 (IRL 6); this contract was signed at a later date than the starting construction contract, hence, the project starting date which equals the date when the starting construction contract was signed, is fully in line with recent EB requirements regarding this date.

In addition the assessment team verified this information with Mr. Sanchis responsible of Hydelec Madagascar during various discussion on site.

The starting date of the project activity is determined to be 19 March 2007, which is before 02 August 2008, as well as prior to the GSP (May 2008). The PPs presented the following information to the assessment team:

- Proposal for Developing the Hydropower Plant Sahanivotry under the CDM (IRL 5);
- Starting construction evidence (IRL 44) and equipment purchasing contract (IRL 6) as already mentioned above.

The original documents presented have been reviewed and verified based on interviews with various representatives of the local authority (see Annex 2). Therefore the documents can be considered appropriate to confirm the prior consideration of CDM. Additionally, in order to confirm that the PPs have taken real actions to continue the activity as CDM, the following timeline has been reviewed against the respective documents presented in the table below:

Activity	Document	Auditor conclusion
February 2001 The project owner signed the Power Purchase Agreement	Power Purchase Agreement with Jirama (IRL 23)	First step towards the project implementation were moved in 2001. However, real implementation of the project did not start



		until 2007: this PPA has been therefore subject to three amendments between 2006 and 2007 (IRL 37, 38 and 15), when the project was re-started considering the CDM.
March 2001 Governmental approval of concession for electricity production	Decree granting the approval for the concession contract (IRL 45).	The concession for electricity production for the 10MW hydro power plant. However it has been confirmed that no further actions toward the implementation of the project were taken until the CDM was considered in May 2006 (IRL 5).
May 2006 Proposal for CDM project development was issued by CDM consultants and shared with the project owner.	Proposal for developing the hydropower plant Sahanivotry (Madagascar) under the CDM (IRL 5).	This document demonstrates that the project owner was at the time fully aware and involved in the initial development of the project as a CDM.
August 2006 African Development Bank (hereafter "AfDB") issued the results of its financial appraisal for the project.	AfDB 2006 financial model (IRL 41).	This document has been considered relevant in the context of the project investment analysis. It also demonstrates that the AfDB was at the time studying the project, as further confirmed in 2007 (IRL 29).
March 2007 Start of Construction activities.	Starting construction order (IRL 44)	The project construction order including a 30% prepayment was signed between the project owner and a local construction company. The starting date of the project activity has been correctly identified with this activity.
10 April 2007 World Bank PIN template was delivered to the project owner and confirmation of project eligibility as CDM.	E-mail exchange "Dossier Fond Carbonne / Hydelec Madagascar" (IRL 7)	The document demonstrates that the project owner was calling for all the necessary support to start the CDM application. The e-mail includes also a clear positive opinion regarding the project eligibility to CDM.
24 April 2007 Turbines and generators were purchased.	Purchasing Contract for Turbine and Generator (IRL 6)	It's confirmed that only end of April 2007, when the basis for the CDM application were already set (see above), the contract for the main equipment purchase was signed.
May 2007 AfDB issued a "Project Brief" report for Sahanivotry	AfDB Project Brief (IRL 29)	The document, based on an appraisal started on 15 July 2006, provides an depiction of the CDM project financing clearly enlightening the relevance of the CDM application. The document further proves the ongoing CDM actions.
July 2007 - The first loan contract with AfDB was signed. - Project Idea Note was finalized	Loan Agreement (IRL 46) and Project Idea Note (IRL 4)	Based on the results of the appraisal as presented in the "Project Brief" (IRL 29), the AfDB decided to grant the loan to the project owner for developing the project under the CDM. A second loan was then granted (IRL 22) by local commercial banks on the basis of the participation of



		the AfDB as a reducing risk factor. At the same time, Project Idea Note was finalized
May 2008 Start of Validation	Order to TÜV SÜD, GSP Start (UNFCCC Webpage)	Start of validation work by TÜV SÜD also clearly indicates that CDM actions were on-going.
August 2009 ERPA was signed between the PPs	Emission Reduction Purchase Agreement	The ERs purchasing agreement was finalized, formalized and signed, providing further credibility to the steps taken in order to reach the CDM status.

This confirms that the project complies with the requirements to demonstrate the prior consideration of the CDM.

### 3.6.2 Identifications of alternatives

The output of the project is electricity production with Hydropower plant.

The list of alternatives to supply the above mentioned outputs presented in the PDD includes the project activity undertaken without being registered as a CDM project. The remaining alternatives presented do include all plausible scenarios taking into account the local and sectoral situations for the mentioned outputs. The list of alternatives is therefore considered complete.

### 3.6.3 Investment barrier analysis

The PP uses the investment barrier analysis indicated in the Attachment A to Appendix B of the simplified modalities and procedures for small-scale CDM project activities in order to enlighten the economic additionality of the project. Accordingly, the project results less economically / financially attractive than the baseline, with a project IRR of 12.45% out of a real return on private equity required by African Development Bank of 15%.

The parameters used in the financial calculations (annual net power generation, power prices, static total investment, annual O&M costs) have been validated based on a revision of the sources presented in the PDD, inter alia the African Development Bank financial model 2006 (IRL 41) which has been the main driver for setting the project financing; the same were confirmed verbally on-site. Furthermore, the period of time between the finalization of the AfDB and the investment decision is only 7 months (construction order signed in March 2007), therefore it can be confirmed that it is unlikely that the input values have significantly changed in accordance with EB51 Annex 3 §111 (a); further confirmation of this has been obtained by the DOE getting in touch with AfDB who confirmed (IRL 74) that no significant changes in the input values occurred between the finalization of the financial model (August 2006) and the investment decision (March 2007). In addition, as per item (b) of §111 of the same document, a throughout review of the input values definitely applied in PDD – investment analysis has been done by the DOE; full consistency has been found between the input values as included in the AfDB financial model (IRL 41) and the IRR calculation sheet (IRL 39). Additionally, based on the following documents, a series of crosschecks have been done:

- 2<sup>nd</sup> Amendment to Power Purchase Agreement (IRL 38), indicating a grid price of 136 MGA/kWh which is the same price utilized in AfDB financial model (IRL 41) as base tariff for 2006;

- 3<sup>rd</sup> Amendment to Power Purchase Agreement (IRL 15), indicating a grid price of 142 MGA/kWh which is the same price utilized in AfDB financial model (IRL 41) as base tariff for 2007;
- Real Generation and Revenues 2008 – 2009 (IRL 49), and power invoices for the period October 2008 to December 2009 (IRL 59 to 73) indicating actual power production and applied tariffs; the documents allow to confirm as conservative the annual power delivered to the grid as expected in AfDB financial model (IRL 41) and as used in PDD; in particular, taking into consideration first entire year of operation 2009, power production results 75,637,380 kWh which is 6.22% lower than the value estimated in the AfDB financial model (IRL 41) used in PDD (80,650,000 kWh). In addition, it has been confirmed that within this one year period, the actual average nominal grid price (150 MGA/kWh) has been lower than the values as projected in AfDB financial model (IRL 41) i.e. 159.3 MGA/kWh and 172.6 MGA/kWh respectively in 2008 and 2009.
- Official notice regarding power delivered by the project to Jirama within the period October 2008 to September 2009 (IRL 50), countersigned by Jirama and indicating in details the power delivered to Jirama in the first year of operation. This document should be considered as a further crosscheck of the actual power delivered to the grid within the above mentioned period.

The above allows the DOE to confirm as per requirement EB51 Annex 3 §111 (c) that the parameters are plausible and can be considered acceptable and even conservative under the project situation and country context.

It should be noted that the results in terms of plant load factors (PLF = 0.65%) and, then, in terms of net power delivered to the grid have been provided to AfDB bank while applying the project activity for project financing (according to IRL 41); the DOE accordingly consider as duly satisfied the requirement as stated in EB 48 Annex 11 under section 3 (a).

The benchmark used for the financial comparison has been obtained from AfDB financial model 2006 (IRL 41). This value (15%) has been checked against the source and has been found as the most appropriate in the context of the project specific risks in terms of required real return on private equity as defined by the AfDB financial model in case of 100% equity investment. The suitability of the applied benchmark has been checked as per EB51 Annex 3, §110; as per item (a) the benchmark has been deemed suitable as the same has been specifically defined on the basis of the AfDB financial model which can be considered as an authoritative and independent agency with a deep knowledge of the country. Furthermore, as per item (b), it's confirmed that no specific risk premiums have been applied by AfDB in determining the benchmark. In addition, as per item (c), the DOE could confirm that no investment would have been made at a rate of return lower than the benchmark; in particular it should be noted that the power plant is the first hydropower plant constructed since 25 years in the entire country. According to the critical history in terms project financing (see also next section 3.6.4.) and as further confirmed in "Project Brief" issued by AfDB on May 2007 (IRL 29) the CDM was identified as an essential requirement for improving the financial viability of the project and cross the benchmark, allowing the AfDB and other local banks to grant loans for the proposed project. An internal rate of return lower than the benchmark would have thus lead the project owner not to benefit of project financing definitely making the project not feasible due to the evidenced financial barrier. As per EB51 Annex 58 §13, it's confirmed that the entity developing the benchmark (AfDB) can be considered as a relevant financial authority. It's thus confirmed that the applied benchmark is suitable for the type of financial indicator presented.

Further assumptions presented in the financial analysis inter alia lifetime and taxes have also been reviewed and were found to be appropriate based on the AfDB financial model (IRL 41). This confirms that the underlying assumptions are appropriate for this project.

A sensitivity analysis is also presented in the PDD including up to +/- 10% variations in the key parameters such as total investment, annual operating and maintenance costs and power sales revenue; according to the analysis it's noted that despite +/- 10% variations are applied, the benchmark is never met. In addition, it's confirmed that similar variations in these parameters are unrealistic: an analysis of the real power generation and revenues (IRL 49) based on the power invoices issued between November 2008 and January 2010 (IRL 59 to IRL 73) allows to exclude a similar increase in power sales revenue as both the actual electricity and the actual power generation have been found lower than the values predicted in AfDB financial model 2006 and used in PDD. Accordingly it's here confirmed that the assumptions used in PDD for investment analysis in regards to power generation and grid tariff are conservative in the context of the project activity. The financial calculations, expressed in real terms, have been verified (IRL 39) and no mistakes have been found.

### 3.6.4 Barrier analysis

The project participants have used also other barriers as important factors to demonstrate the additionality of the project. The presented barriers can be summarized as follows:

- Critical project financing;
- Policy Barriers;
- Capacity Barriers;

The assessment team verified if any of the barriers have a clear impact on the financial returns which can be expressed through reasonable certainty in monetary terms; the final PDD includes only barriers without such impacts on the financial returns. However the combination of these barriers has been demonstrated to play a decisive role in securing access to loan and project financing.

The critical project financing has been assessed against official documents such as the Global Competitiveness Index 2007 (IRL 51) and the Doing Business ranking (IRL 52) developed by the World Economic Forum and the World Bank respectively; in particular it has been confirmed that the access to financing, but also inflation and corruption (IRL 51) represents the most problematic factors for doing business in the country. A similar conclusion can be drawn as per World Bank Doing Business ranking which in 2009 report ranks 174 (out of 183) the position of the country in regards to "Getting credit" parameter: even if this ranking is based on 2009 (no rankings earlier than 2009 are available in terms of "Getting credit" parameter) it's deemed reasonable here to make use of it as indicative reference for 2006, when the project was conceptualized, given that no particular changes in the country situation/economics occurred between 2006 and 2009. Accordingly the difficulties to get credit as drawn by the World Bank in 2009 (IRL 52) allows to further confirm that, the barrier envisaged in 2006 by project participants was real and even still a critical issue today. With reference to the specific project history, an initial involvement of the German DEG bank has been evidenced (IRL 26); the intention to participate in the project was then retreated, according to the clarifications given by PPs, due to the lack of financial attractiveness of the project as a result of a due diligence undertaken. This explanation has been deemed as highly credible as definitely only the entrance of a non-commercial bank (African Development Bank - AfDB), in parallel with the proposal to develop the project as a CDM, allowed the project to get financing in 2006; it should be noted that loan from AfDB was granted on July 2007 (IRL 46), only after the confirmation of project eligibility to CDM was received by the project participants on April 2007 (IRL 7). The fact that CDM was identified as an essential requirement for granting the project financing also resulted in "Project Brief" issued by AfDB on May 2007 (IRL 29).

The result of this assessment clearly shows that the barrier presented in the PDD can be considered real and that the CDM has been the main driver in reducing the project risks definitely overcoming the critical project financing barrier.

Definitely, this barrier would have prevented the project activity but would not have prevented the baseline of the project.

The Policy Barrier has been assessed against official documents such as the African Economic Outlook 2006 (IRL 47) and Doing Business ranking (IRL 52). In particular, according to OECD (IRL 47) it has been confirmed that the main policy at Jirama was to focus the efforts in building thermal plants due to a lower initial investment required; the difficulties in receiving the construction permits (it took six years to get the permission to start the activities with water diversion – IRL 8) have been recognized as an additional difficulty, as evidenced by The World Bank Doing Business (IRL 52).

The result of this assessment clearly shows that the barrier presented in the PDD can be considered real. Nevertheless, the implementation of the project as a CDM played an important role in enhancing the project visibility and facilitating the finalization of the necessary agreement with Jirama in 2007 (IRL 15).

The Capacity Barrier has been assessed against official documents such as the structure of existing production park by RI TANA (IRL 35). As a result it's concluded that the proposed project activity is the first hydro plant implemented since 25 years; in particular, it has been evidenced that 5 hydropower stations are there in the country and that the most recent is operational since 1982; the remaining plant were developed between 1930 and 1956. The result of this assessment clearly shows that the barrier presented in the PDD can be considered real.

The implementation of the project as a CDM has been thus considered as an important driver in this context which enhanced the development of the hydroelectric technology after a long period of stagnation and a history of non-implementation of this kind of plants.

Taking into account the description of the validation of the barriers presented above, the assessment team can confirm, with reasonable certainty, that the barriers are credible and correctly presented to demonstrate the additionality of the project. The recent Guidelines for Objective Demonstration and Assessment of Barriers (EB50 – Annex 13) have been duly satisfied, in particular with reference to the evidenced limits of this Least Developed Country.

### 3.6.5 Common practice analysis

Common practice analysis was not applied for this project according to the simplified modalities and procedures for small-scale clean development mechanism project activities.

## 3.7 Monitoring plan

The monitoring plan presented in the PDD complies with the requirements of the applicable methodology. The assessment team has verified all parameters in the monitoring plan against the requirements of the methodology; no relevant deviations have been found.

The procedures have been reviewed by the assessment team through document review and interviews with the relevant personnel. This information, together with a physical inspection, allows the assessment team to confirm that the proposed monitoring plan is feasible, and within the project design. The major parameters to be monitored have been discussed with the PPs. In specific, these parameters include the location of meters, data management, and the quality assurance and quality control procedures to be implemented in the context of the project. Two mono-directional meters will be installed in order to monitor the power generation. Calibration will occur annually based on the requirements of Jirama. According to the monitoring plan, the data will be cross-checked against the sales receipt from Jirama and/or records from the grid for quality control. A diesel generator for back-up purposes is installed on site and fuel consumption will be monitored in order to estimate and subtract related project emissions from baseline emissions in order to calculate emission reduction. Therefore, we find that the PP's will be able to implement the monitoring plan and the achieved emission reductions can be reported ex-post and verified.

### **3.8 Sustainable development**

The LoA of the host country presented a statement that the project contributes to the sustainable development of the host party.

### **3.9 Local stakeholder consultation**

The relevant local stakeholders have been informed in the context of the Environmental Impact Assessment via various newspaper publications. The evidence of these invitations is found in IRL 54. The assessment team has reviewed the documentation in order to validate the inclusion of relevant stakeholders. Team local expertise confirmed that the communication method used to invite the stakeholders was appropriate. The summary of comments presented in the PDD has been verified with the documentation of the stakeholder consultation and is found to be complete.

Comments presented by the local stakeholders have been taken into account by the PP. This has also been verified with information obtained during interviews.

Hence, the local stakeholder consultation has been adequately performed according to the CDM requirements.

### **3.10 Environmental impacts**

The project participants undertook an environmental impact assessment. The assessment team reviewed the documentation of the presented information. The IRL (15) “Etude d’impact Environnemental De la Centrale Hydroelectrique de Sahanivotry” dated December 2001 confirms the correctness of the approach used by the PPs. We conclude that the PPs followed the requirements of the host country in regard to environmental impacts.

## 4 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS

TÜV SÜD published the project documents on the UNFCCC website, and invited comments by affected Parties, stakeholders, and non-governmental organisations during a 30 day period.

The following table presents all gathered key information:

<b>website:</b> <a href="http://www.netinform.de/KE/Wegweiser/Guide2_1.aspx?ID=4890&amp;Ebene1_ID=26&amp;Ebene2_ID=1506&amp;mode=1">http://www.netinform.de/KE/Wegweiser/Guide2_1.aspx?ID=4890&amp;Ebene1_ID=26&amp;Ebene2_ID=1506&amp;mode=1</a>	
<b>Starting date of the global stakeholder consultation process:</b> 2008-05-17	
<b>Comment submitted by:</b> None	<b>Issues raised:</b> -
<b>Response by TÜV SÜD:</b> -	



## 5 VALIDATION OPINION

TÜV SÜD has performed a validation of the following proposed CDM project activity:

Sahanivotry Hydro Power Plant, Madagascar

Standard auditing techniques have been used for the validation of the project. Methodology-specific customized checklists and a protocol for the project have been prepared to carry out the audit in order to present the outcome in a transparent and comprehensive manner.

The review of the project design documentation, subsequent follow-up interviews and further verification of references have provided TÜV SÜD with sufficient evidence to determine the fulfilment of stated criteria in the protocol. In our opinion, the project meets all relevant UNFCCC requirements for the CDM if the underlying assumptions do not change. TÜV SÜD will recommend the project for registration by the CDM Executive Board.

An analysis, as provided by the applied methodology, demonstrates that the proposed project activity is not a likely baseline scenario. Emission reductions attributable to the project are additional to any that would occur in the absence of the project activity. Given that the project is implemented as designed, the project is likely to achieve the estimated amount of emission reductions as specified within the final PDD version.

The validation is based on the information made available to us, as well as the engagement conditions detailed in this report. The validation has been performed following the VVM requirements. The single purpose of this report is its use during the registration process as part of the CDM project cycle. TÜV SÜD can therefore not be held liable by any party for decisions made, or not made, based on the validation opinion beyond that purpose.

Munich, 25-03-2010



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Thomas Kleiser

Certification Body "climate and energy"  
TÜV SÜD Industrie Service GmbH

Munich, 25-03-2010



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Martin Schröder

Assessment Team Leader



Validation of the CDM Project:  
Small-Scale Hydropower Project Sahanivotry in Madagascar



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## **Annex 1: Validation Protocol**

## Validation Protocol

Project Title: Small-Scale Hydropower Project Sahainivotry in Madagascar

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CHECKLIST TOPIC / QUESTION	Ref.	COMMENTS	PPD in GSP	Final PDD
<b>A. General description of small-scale project activity</b>				
<b>A.1. Title of the small-scale project activity</b>				
A.1.1. Does the used project title clearly enable to identify the unique CDM activity?	1, 2	The name of the project location and the energy source of the project are the title of the project. Thus, it can be clearly identified.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
A.1.2. Are there any indication concerning the revision number and the date of the revision?	1, 2	The version number of the available PDD for document review is 01 and it has been submitted on May 13rd, 2008.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
A.1.3. Is this consistent with the time line of the project's history?	1, 2	<b><u>Corrective Action Request No.1.</u></b> Pls. add the Revision History of PDDs in A.1	CAR 1	<input checked="" type="checkbox"/>
<b>A.2. Description of the small-scale project activity</b>				
A.2.1. Is the description delivering a transparent overview of the project activities?	1, 2	Sahavinotry Hydro Power consists of a run-of-river hydropower plant with a capacity of 15 MW with an average electricity generation of 90 GWh per year. The location is on the river Ampharohana within Sahavinotry village about 30 km of Antsirabé, Antananarivo Province, Madagascar.  The plant will be connected to the regional grid of Antananarivo	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
A.2.2. What proofs are available demonstrating that the project description is in compliance with the actual situation or planning?	1, 2, 6, 7, 9, 10, 12, 13, 14, 15, 16	The project activity is the displacement of electricity generated by coal fired power plants with electricity generated by hydro power. The following data deliver evidences for the project activity: <ul style="list-style-type: none"> <li>- Proposal for Developing the hydropower plant Sahainivotry (Madagascar) under the CDM, by Pöyry Energy GmbH;</li> <li>- Etude d'impact Environmental De la Centrale Hydroelectrique de Sahainivotry;</li> <li>- Contract for purchasing of Turbine and Generator;</li> <li>- Environmental Authorization by the "Ministre de l'Energie";</li> <li>- Arrêté N° 21-016/2007 autorisant une augmentation de la</li> </ul>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

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		puissance de la central hydroélectrique de Sahanivotry”, Le Ministre de L’Energie et de Mines, dated 28/11/2007 These data have been evidenced during the audit.		
A.2.3. Is the information provided by these proofs consistent with the information provided by the PDD?	1,2	Yes, the information is consistent with the same with the PDD.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
A.2.4. Is all information presented consistent with details provided by further chapters of the PDD?	1,2	Yes, no contradictions have been found in further chapters of PDD.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
A.2.5. Does the description of the technology to be applied provide sufficient and transparent input to evaluate its impact on the greenhouse gas balance?	1,2	Undoubtedly, this project will reduce GHG emissions significantly, because it is a new hydro electric power project. Furthermore this project is located in a country where the thermal production of electricity has been increasing and so it contribute to decrease the GHG emission from use of fossil fuels.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
A.2.6. Is the brief explanation how the project will reduce greenhouse gas emission transparent and suitable?	1,2	Electricity is going to be generated through the utilization of the renewable source and it will avoid the possible emissions produced by the use of fossil fuels. Doubtlessly, the proposed project activity will reduce greenhouse gas emissions.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<b>A.3. Project participants</b>				
A.3.1. Is the form required for the indication of project participants correctly applied?	1,2	The form required by the template is used in PDD.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
A.3.2. Is the participation of the listed entities or Parties confirmed by each one of them?	1,2	The project owner is Hydelec Madagascar SA. The purchasing party is Kommunalkredit Public Consulting. The related information has been confirmed with the project owner and CDM developer. <b><u>Open Issue:</u></b> Pls. deliver the LoA issued by Madagascar and Austria together with MoC countersigned by both parties to DOE before raising the request of registration.	Open Issue	<input checked="" type="checkbox"/>

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A.3.3. Is all information on participants / Parties provided in consistency with details provided by further chapters of the PDD (in particular annex 1)?		The information of both participants given in Annex 1 is consistent with the one in A.3. of PDD.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<b>A.4. Technical description of the small-scale project activity</b>				
<b>A.4.1. Location of the small-scale project activity</b>				
A.4.1.1. Does the information provided on the location of the project activity allow for a clear identification of the site(s)?	1,2	The site location's geographical coordinates are given in PDD.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
A.4.1.2. How is it ensured and/or demonstrated, that the project proponents can implement the project at this site (ownership, licenses, contracts etc.)?	1, 2, 8, 11, 12, 13	<p>The project proponents have demonstrated through several evidences that the project got all the licences and authorizations to be implemented with no concerns; In particular the following documents ensure this:</p> <ul style="list-style-type: none"> <li>- "Permis de Prélèvement d'eau au droit de la station hydroélectrique à Sahanivotry sur la rivière Sahanivotry, Autorité Nationale de l'eau e de l'Assainissement" – ANDEA, n°132-07, dated 21/05/2007;</li> <li>- "Autorisation Environnementale", Ministre de l'Energie, dated 21/06/2007;</li> <li>- Autorization n°40 ME/SG/DG/DEN for starting construction and increasing of the capacity from 10MW to 15MW, de Ministère de l'énergie à Monsier le Directeur Général Société Hydelec Madagascar, dated 07/03/2007;</li> <li>- "Arrêté N° 21-016/2007 autorisant une augmentation de la puissance de la central hydroélectrique de Sahanivotry", dated 28/11/2007;</li> </ul>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<b>A.4.2. Type and category(ies) and technology/measure of the small-scale project activity</b>				
A.4.2.1. To which type(s) does the project activity belong to? Is the type correctly identified and indicated?	1,2	The project activity falls into Type I – Renewable Energy Projects, because it utilizes hydropower for power generation.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

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A.4.2.2. To which category (ies) does the project activity belong to? Is the category correctly identified and indicated?	1,2	Given that the capacity of the project is 15 MW, not exceeding the threshold capacity of 15 MW, moreover, the generated electricity is supplied to the Regional Grid of Antananarivo, for this reason, the Category is I-D – Grid connected renewable electricity generation.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
A.4.2.3. Does the technical design of the project activity reflect current good practices?	1,2, 45	The project will use three new Pelton turbines and three new generators. The equipments installed, as indicated in “Contrat de concession”, will answer to efficiency criteria, technical exigencies and economical considerations.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
A.4.2.4. Does the implementation of the project activity require any technology transfer from Annex-I-countries to the host country (ies)?	1,2, 9, 10	The equipment was imported from countries that possess the experience, technology and proven environmentally sound and safe project. As verified on site, turbines and alternators come from China, the transformers come from a French company. <b><u>Corrective Action Request No.2.</u></b> Pls. specify in the PDD from which countries the equipment was imported and from which society.	CAR 2	<input checked="" type="checkbox"/>
A.4.2.5. Is the technology implemented by the project activity environmentally safe?	1,2	The technology has been used worldwide since decades. It is environmentally safe. Characteristics of the SHPP and its construction will not cause any negative damage to the ecosystem. In addition, the project conserves local biodiversity by planting local 40.000 trees on the project site.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
A.4.2.6. Is the information provided in compliance with actual situation or planning?	1, 2, 56	The technology applied is described in Table 1 of PDD <b><u>Corrective Action Request No.3.</u></b> The “Rated flow” of the Turbine as indicated in PDD is not consistent with the same in the subscribed purchasing agreement for turbine and generator. The inconsistency should be corrected.	CAR 3	<input checked="" type="checkbox"/>
A.4.2.7. Does the project use state of the	1,2	Because the technology of installing a new hydropower plant has	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

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art technology and / or does the technology result in a significantly better performance than any commonly used technologies in the host country?		been fully developed and successfully implemented over world-wide since decades, the technology applied in the proposed project has no difference compared to one that applied at other similar hydropower plants.		
A.4.2.8. Is the project technology likely to be substituted by other or more efficient technologies within the project period?	1,2, 9	No it is not; a substitution of the applied technology with some more efficient system is highly improbable and not easily achievable. This conclusion relies on an analysis of the context in terms of technology development in Madagascar. The project employs state of the art technology and more efficient systems will not likely be available to substitute the project technology.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
A.4.2.9. Does the project require extensive initial training and maintenance efforts in order to be carried out as scheduled during the project period?	1,2, 16, 31, 56	The majority of the technicians comes from the local grid company "Jirama"; those technicians will be trained to carry out their tasks. <b><u>Clarification Request No. 1.</u></b> Pls. deliver the related training evidence, such as, training schedule, training material to audit team.	CR 1	<input checked="" type="checkbox"/>
A.4.2.10. Is information available on the demand and requirements for training and maintenance?	1,2	Pls. refer to CR1.	See CR 1	<input checked="" type="checkbox"/>
A.4.2.11. Is a schedule available for the implementation of the project and are there any risks for delays?	1,2, 56	<b><u>Corrective Action Request No.4.</u></b> The time schedule of the implementation of the power plant should be included into the PDD.	CAR 4	<input checked="" type="checkbox"/>
<b>A.4.3. Estimated amount of emission reductions over the chosen crediting period</b>				
A.4.3.1. Is the form required for the indication of projected emission reductions correctly applied?	1,2, 56	<b><u>Corrective Action Request No.5.</u></b> - Pls. specify each year in table 2 according to the format dd/mm/yyyy –dd/mm/yyyy	CAR 5	<input checked="" type="checkbox"/>
A.4.3.2. Are the figures provided consistent with other data presented in the PDD?	1,2, 57	The yearly emission reduction is estimated to be 44,196 tCO <sub>2</sub> which is the result of emission factor of grid times the annual electricity fed to grid. The same figure is quoted in the entire PDD.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

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A.4.3.3. Are the figures consistent with the small-scale criteria for the used Type?	1,2	The capacity of SHPP is 15MW which is the limit for a small – scale definition.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>										
A.4.4. Public funding of the small-scale project activity														
A.4.4.1. Is the information provided on public funding provided in compliance with the actual situation or planning as available by the project participants?	1, 2, 29, 41	The African Development Bank (AfDB) is lending 6 Mil. € over the next 7 years towards the financing of the project. The AfDB does not claim any compensation in the form of certified emission reductions for the repayment of the loan. <b>Clarification Request No. 2.</b> Pls. deliver the related evidence on public funding to DOE.	CR 2	<input checked="" type="checkbox"/>										
A.4.4.2. Is all information provided consistent with the details given in remaining chapters of the PDD (in particular annex 2)?	1, 2	Same assertions are presented in the PDD.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>										
A.4.5. Confirmation that the small-scale project activity is not a debundled component of a large scale project activity														
A.4.5.1. Is there a registered small-scale CDM project activity or an application to register another small-scale CDM project activity: with the following characteristics:	1,2	<table><tr><th>Debundling checklist</th><th>Yes / No</th></tr><tr><td>the same project participants?</td><td>No</td></tr><tr><td>In the same project category and technology/measure?</td><td>No</td></tr><tr><td>Registered within previous two years? Or in registration process?</td><td>No</td></tr><tr><td>Whose boundary is within 1 km of the project boundary of the small scale project activity under consideration?</td><td>No</td></tr></table>	Debundling checklist	Yes / No	the same project participants?	No	In the same project category and technology/measure?	No	Registered within previous two years? Or in registration process?	No	Whose boundary is within 1 km of the project boundary of the small scale project activity under consideration?	No	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Debundling checklist	Yes / No													
the same project participants?	No													
In the same project category and technology/measure?	No													
Registered within previous two years? Or in registration process?	No													
Whose boundary is within 1 km of the project boundary of the small scale project activity under consideration?	No													
A.4.5.2. If the answer to all the above question is 'Yes' then does the total size of the small scale project activity combined with previously registered small scale CDM project activity exceeds the limits of small scale CDM project activities?	1,2	Because the project fulfils the criteria of small scale project, this section is not applicable	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>										



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B. Application of a baseline and monitoring methodology												
B.1. Title and reference of the approved baseline and monitoring methodology applied to the small-scale project activity												
B.1.1.1.Are reference number, version number, and title of the baseline and monitoring methodology clearly indicated?	1, 2, 56	The AMS-I.D. Renewable electricity generation for a grid (Version 13) is applied to the proposed project. It has been clearly demonstrated in B.1. of PDD. <b><u>Corrective Action Request No.6.</u></b> <ul style="list-style-type: none"><li>- Pls. add where the methodology could be found</li><li>- Pls. specify the tool that it is used in PDD for the baseline calculation;</li></ul>	CAR 6	<input checked="" type="checkbox"/>								
B.1.1.2.Is the applied version the most recent one and / or is this version still applicable?	1,2, 56	Yes, it is the latest versions. Pls. kindly refer to CAR 6	See CAR 6	<input checked="" type="checkbox"/>								
B.2. Justification of the choice of the project category												
B.2.1. Is the applied methodology considered the most appropriate one?	1,2	The project activity, hydropower project providing electricity to the local grid, certainly falls under AMS I.D. as mentioned and justified in the PDD.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>								
B.2.1.1. Criterion 1: This category comprises renewable energy generation units, such as photovoltaics, hydro, tidal/wave, wind, geothermal and renewable biomass, that supply electricity to and/or displace electricity from an electricity distribution system that is or would have been supplied by at least one fossil fuel fired generating unit.	1,2	<table><tr><td>Applicability checklist</td><td>Yes / No / NA</td></tr><tr><td>Criterion discussed in the PDD?</td><td>Yes</td></tr><tr><td>Compliance provable?</td><td>Yes</td></tr><tr><td>Compliance verified?</td><td>Yes</td></tr></table>	Applicability checklist	Yes / No / NA	Criterion discussed in the PDD?	Yes	Compliance provable?	Yes	Compliance verified?	Yes	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Applicability checklist	Yes / No / NA											
Criterion discussed in the PDD?	Yes											
Compliance provable?	Yes											
Compliance verified?	Yes											
B.2.1.2. Criterion 2: If the unit added has both renewable and non-renewable compo-	1,2	<table><tr><td>Applicability checklist</td><td>Yes / No / NA</td></tr></table>	Applicability checklist	Yes / No / NA	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>						
Applicability checklist	Yes / No / NA											

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nents (e.g.. a wind/diesel unit), the eligibility limit of 15MW for a small-scale CDM project activity applies only to the renewable component. If the unit added co-fires fossil fuel, the capacity of the entire unit shall not exceed the limit of 15MW.		<table><tr><td>Criterion discussed in the PDD?</td><td>NA</td></tr><tr><td>Compliance provable?</td><td>NA</td></tr><tr><td>Compliance verified?</td><td>NA</td></tr></table>	Criterion discussed in the PDD?	NA	Compliance provable?	NA	Compliance verified?	NA				
Criterion discussed in the PDD?	NA											
Compliance provable?	NA											
Compliance verified?	NA											
B.2.1.3. Criterion 3: Combined heat and power (co-generation) systems that supply electricity to and/or displace electricity from a grid are <b>not</b> included in this category.	1,2	<table><tr><td>Applicability checklist</td><td>Yes / No / NA</td></tr><tr><td>Criterion discussed in the PDD?</td><td>NA</td></tr><tr><td>Compliance provable?</td><td>NA</td></tr><tr><td>Compliance verified?</td><td>NA</td></tr></table>	Applicability checklist	Yes / No / NA	Criterion discussed in the PDD?	NA	Compliance provable?	NA	Compliance verified?	NA	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Applicability checklist	Yes / No / NA											
Criterion discussed in the PDD?	NA											
Compliance provable?	NA											
Compliance verified?	NA											
B.2.1.4. Criterion 4: In the case of project activities that involve the addition of renewable energy generation units at an existing renewable power generation facility, the added capacity of the units added by the project should be lower than 15 MW and should be physically distinct from the existing units.	1,2	<table><tr><td>Applicability checklist</td><td>Yes / No / NA</td></tr><tr><td>Criterion discussed in the PDD?</td><td>NA</td></tr><tr><td>Compliance provable?</td><td>NA</td></tr><tr><td>Compliance verified?</td><td>NA</td></tr></table>	Applicability checklist	Yes / No / NA	Criterion discussed in the PDD?	NA	Compliance provable?	NA	Compliance verified?	NA	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Applicability checklist	Yes / No / NA											
Criterion discussed in the PDD?	NA											
Compliance provable?	NA											
Compliance verified?	NA											
B.2.1.5. Criterion 5: Project activities that seek to retrofit or modify an existing facility for renewable energy generation are included in this category. To qualify as a small scale project, the total output of the modified or retrofitted unit shall not exceed the limit of 15 MW.	1,2	<table><tr><td>Applicability checklist</td><td>Yes / No / NA</td></tr><tr><td>Criterion discussed in the PDD?</td><td>NA</td></tr><tr><td>Compliance provable?</td><td>NA</td></tr><tr><td>Compliance verified?</td><td>NA</td></tr></table>	Applicability checklist	Yes / No / NA	Criterion discussed in the PDD?	NA	Compliance provable?	NA	Compliance verified?	NA	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Applicability checklist	Yes / No / NA											
Criterion discussed in the PDD?	NA											
Compliance provable?	NA											
Compliance verified?	NA											
B.2.1.6. If the project is under a programme of activities, have all the applicability crite-	1,2	The project is not under a programme of activities.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>								

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ria and additional requirements been considered according to the methodology?				
<b>B.3. Description of the project boundary</b>				
B.3.1. Does the project boundary include physical, geographical site where the project activity takes place?	1,2	As stated in PDD, the project boundary is the physical, geographical site of the renewable generation source.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.3.2. Do the spatial and technological boundaries as verified on-site comply with the discussion provided by / indication included to the PDD?	1,2	The spatial and technological boundaries as verified on-site are in compliance with the description provided in PDD.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<b>B.4. Description of baseline and its development</b>				
B.4.1. Have all technically feasible baseline scenario alternatives to the project activity been identified and discussed by the PDD? Why can this list be considered as being complete?	1, 2, 56	The baseline scenario is set to be: continued operation of the existing power plants in the system and the addition of new generation sources to meet electricity demand. <b><u>Corrective Action Request No.7.</u></b> All the feasible scenarios shall be completely listed and the reason for excluding the other scenarios shall be given in the revised PDD.	CAR 7	<input checked="" type="checkbox"/>
B.4.2. Does the project identify correctly and excludes those options not in line with regulatory or legal requirements?	1, 2, 56	Pls. kindly refer to CAR 7.	See CAR 7	<input checked="" type="checkbox"/>
B.4.3. Have applicable regulatory or legal requirements been identified?	1, 2, 56	Pls. kindly refer to CAR 7.	See CAR 7	<input checked="" type="checkbox"/>
B.4.4. Does the PDD identify the most likely baseline scenario in absence of the project activity?	1, 2, 56	Pls. kindly refer to CAR 7.	See CAR 7	<input checked="" type="checkbox"/>
B.4.5. Is this identification supported by official and/or verifiable documents (e.g. studies,	1, 2, 56	Pls. kindly refer to CAR 7.	See CAR 7	<input checked="" type="checkbox"/>

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web pages, certificates, etc?					
B.4.6.	Is the identified baseline scenario in line with regulatory or legal requirements?	1, 2, 56	Pls. kindly refer to CAR 7.	See CAR 7	<input checked="" type="checkbox"/>
<b>B.5. Description of how the anthropogenic emissions of GHG by sources are reduced below those that would have occurred in the absence of the registered small-scale CDM project activity:</b>					
<b>If the additionality tool has been used please answer B.5.1 to B.5.13</b>					
B.5.1.	Has CDM been considered before the starting date of the project activity? What kind of evidences are available?	1,2	The additionality tool has not been used, so, this section is not applicable.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.5.2.	In case of applying step 2 / investment analysis of the additionality tool: Is the analysis method identified appropriately (step 2a)?	1,2	The additionality tool has not been used, so, this section is not applicable.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.5.3.	In case of Option I (simple cost analysis): Is it demonstrated that the activity produces no economic benefits other than CDM income?	1,2	The additionality tool has not been used, so, this section is not applicable.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.5.4.	In case of Option II (investment comparison analysis): Is the most suitable financial indicator clearly identified (IRR, NPV, cost benefit ratio, or (levelized) unit cost)?	1,2	The additionality tool has not been used, so, this section is not applicable.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.5.5.	In case of Option III (benchmark analysis): Is the most suitable financial indicator clearly identified (IRR, NPV, cost benefit ratio, or (levelized) unit cost)?	1,2	The additionality tool has not been used, so, this section is not applicable.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.5.6.	In case of Option II or Option III: Is the calculation of financial figures for this indicator correctly done for all alternatives and the project activity?	1,2	The additionality tool has not been used, so, this section is not applicable.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

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B.5.7.	In case of Option II or Option III: Is the analysis presented in a transparent manner including publicly available proofs for the utilized data?	1,2	The additionality tool has not been used, so, this section is not applicable.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.5.8.	In case of applying step 3 (barrier analysis) of the additionality tool: Is a complete list of barriers developed that prevent the different alternatives to occur?	1,2	The additionality tool has not been used, so, this section is not applicable.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.5.9.	In case of applying step 3 (barrier analysis): Is transparent and documented evidence provided on the existence and significance of these barriers?	1,2	The additionality tool has not been used, so, this section is not applicable.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.5.10.	In case of applying step 3 (barrier analysis): Is it transparently shown that the execution of at least one of the alternatives is not prevented by the identified barriers?	1,2	The additionality tool has not been used, so, this section is not applicable.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.5.11.	Have other activities in the host country / region similar to the project activity been identified and are these activities appropriately analyzed by the PDD (step 4a)?	1,2	The additionality tool has not been used, so, this section is not applicable.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.5.12.	If similar activities are occurring: Is it demonstrated that in spite of these similarities the project activity would not be implemented without the CDM component (step 4b)? How?	1,2	The additionality tool has not been used, so, this section is not applicable.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.5.13.	Is it appropriately explained how the approval of the project activity will help to overcome the economic and financial hurdles or other identified barriers?	1,2	The additionality tool has not been used, so, this section is not applicable.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

**If the additionality tool has not been used please answer B.5.14 to B.5.19**

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B.5.14.	If the starting date of the project activity is before the date of validation, is evidence available to prove that incentive from the CDM was seriously considered in the decision to proceed with the project activity?	1,2, 5, 6, 7, 29, 41, 44, 45, 56	The proposal for developing the hydropower plant in Sahanivotry under the CDM (from Pöyry Energy GmbH) is dated 24/05/2006. The project idea note is dated July 9 <sup>th</sup> 2007. The key events leading to the CDM decision have been discussed during the on-site audit; however, <b><u>Corrective Action Request No.8.</u></b> Pls. add the table of key events from the very first project ideas to the decision to apply for CDM and the starting of the project activities. Dates and relative evidences should be provided.	CAR 8	<input checked="" type="checkbox"/>															
B.5.15.	Is a complete list of barriers developed that prevents the project activity to occur?	1,2	Yes, there is a complete list of the barriers: institutional, financial, technological and capacity barrier. All of them are discussed.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>															
B.5.16.	Does this list include at least one of the following barriers?	1,2	<table><tr><th>Barrier</th><th>Discussed?</th><th>Verifiable?</th></tr><tr><td>Investment</td><td>Yes</td><td>Yes</td></tr><tr><td>Technological</td><td>Yes</td><td>Yes</td></tr><tr><td>Due to prevailing practice</td><td>Yes</td><td>Yes</td></tr><tr><td>Other</td><td>Yes</td><td>Yes</td></tr></table>	Barrier	Discussed?	Verifiable?	Investment	Yes	Yes	Technological	Yes	Yes	Due to prevailing practice	Yes	Yes	Other	Yes	Yes	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Barrier	Discussed?	Verifiable?																		
Investment	Yes	Yes																		
Technological	Yes	Yes																		
Due to prevailing practice	Yes	Yes																		
Other	Yes	Yes																		
B.5.17.	Does the discussion sufficiently take into account relevant national and/or sectoral policies?	1,2	Yes, in PDD there is the advertence to the MAP adopted by the Malagasy Government in 2006 about electrical development of the host country.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>															
B.5.18.	Is transparent and documented evidence provided on the existence and significance of these barriers?	1,2, 47	The OECD's African Economic Outlook 2005-2006 and the World Bank's Africa Action Plan summarize the main barriers to the implementation of small hydro projects; the information given are based on reliable documented sources.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>															
B.5.19.	Is it appropriately explained how the approval of the project activity will help to overcome the identified barriers?	1,2	The registration of CDM, doubtless, will help to overcome the financial barriers which the project owner faces now and this project activity will have a very special role for the future development of the electricity sector in Madagascar. However, <b><u>Clarification Request No. 3.</u></b> It should be better clarified in the PDD the reason for the application of the project as a CDM and how the barriers could be over-	CR 3	<input checked="" type="checkbox"/>															

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		come.								
B.6. Emissions reductions										
B.6.1. Explanation of methodological choices										
B.6.1.1. Is it explained how the procedures provided in the methodology are applied by the proposed project activity?	1,2	Pls. kindly refer to CAR6	See CAR 6	<input checked="" type="checkbox"/>						
B.6.1.2. Is every selection of options offered by the methodology correctly justified and is this justification in line with the situation verified on-site?	1,2	The methodology provides two alternatives for the baseline calculation. The project plant is expected to displace predominantly new capacity that is added to the grid and power generated by plants at the operating margin. Therefore, the baseline emission factor has been calculated as the average of the approximate operating margin and the build margin.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>						
Determination of project emissions (Comment on any line answered “No”)										
B.6.1.3. Component 1: emissions from use of fossil fuel	1,2	<table><tr><th>Project emission checklist</th><th>Yes / No</th></tr><tr><td>Component discussed in the PDD?</td><td>N.A.</td></tr><tr><td>Formulae correctly applied?</td><td>N.A.</td></tr></table> <p>Because the proposed project activity is a newly installed hydro-power plant, no fossil fuel will be used for the project activity, this section is not applicable.</p>	Project emission checklist	Yes / No	Component discussed in the PDD?	N.A.	Formulae correctly applied?	N.A.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Project emission checklist	Yes / No									
Component discussed in the PDD?	N.A.									
Formulae correctly applied?	N.A.									
B.6.1.4. Are the formulae required for the determination of baseline emissions correctly presented, enabling a complete identification of parameters to be used and / or monitored?	1,2	The calculation process to count OM and BM and their results are quoted in PDD. However, Pls. kindly refer to CAR5	See CAR 5	<input checked="" type="checkbox"/>						
B.6.1.5. Are the formulae required for the determi-	1,2	Since there's no energy generating equipment being transferred	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>						



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nation of leakage emissions correctly presented, enabling a complete identification of parameter to be used and / or monitored?		from or to another activity, the leakage needs not to be taken into account.																				
B.6.1.6. Are the formulae required for the determination of emission reductions correctly presented?	1,2	Yes, they are. However, Pls. kindly refer to CAR5	See CAR 5	<input checked="" type="checkbox"/>																		
B.6.2. Data and parameters that are available at validation																						
B.6.2.1. Is the list of parameters presented in chapter B.6.2 considered to be complete with regard to the requirements of the applied methodology?	1,2, 56	<b><u>Corrective Action Request No.9.</u></b> Pls. refer to the following B.6.2.2 – B.6.2.12 in protocol to complete the parameter list which are required as per methodology.	CAR 9	<input checked="" type="checkbox"/>																		
Comment on any line answered with “No”. Add additional parameters used for the calculation of the grid factors if necessary.																						
B.6.2.2. Parameter Title: Annual electricity supplied to the grid prior to retrofit (applicable only for retrofit and modification activities)	1,2	<table><tr><th>Data Checklist</th><th>Yes / No</th></tr><tr><td>Title in line with methodology?</td><td>N.A.</td></tr><tr><td>Data unit correctly expressed?</td><td>N.A.</td></tr><tr><td>Appropriate description of parameter?</td><td>N.A.</td></tr><tr><td>Source clearly referenced?</td><td>N.A.</td></tr><tr><td>Correct value provided?</td><td>N.A.</td></tr><tr><td>Has this value been verified?</td><td>N.A.</td></tr><tr><td>Choice of data correctly justified?</td><td>N.A.</td></tr><tr><td>Measurement method correctly described?</td><td>N.A.</td></tr></table>	Data Checklist	Yes / No	Title in line with methodology?	N.A.	Data unit correctly expressed?	N.A.	Appropriate description of parameter?	N.A.	Source clearly referenced?	N.A.	Correct value provided?	N.A.	Has this value been verified?	N.A.	Choice of data correctly justified?	N.A.	Measurement method correctly described?	N.A.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Data Checklist	Yes / No																					
Title in line with methodology?	N.A.																					
Data unit correctly expressed?	N.A.																					
Appropriate description of parameter?	N.A.																					
Source clearly referenced?	N.A.																					
Correct value provided?	N.A.																					
Has this value been verified?	N.A.																					
Choice of data correctly justified?	N.A.																					
Measurement method correctly described?	N.A.																					
B.6.2.3. Parameter Title: Emission factor of the grid (CM)	1,2, 56	<table><tr><th>Data Checklist</th><th>Yes / No</th></tr><tr><td></td><td></td></tr></table>	Data Checklist	Yes / No			See CAR 9	<input checked="" type="checkbox"/>														
Data Checklist	Yes / No																					

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Note: CM should be calculated as per the procedures described in the “Tool to calculate the emission factor for an electricity system”		Title in line with methodology?	No																				
		Data unit correctly expressed?	No																				
		Appropriate description of parameter?	No																				
		Source clearly referenced?	No																				
		Correct value provided?	Yes																				
		Has this value been verified?	Yes																				
		Choice of data correctly justified?	No																				
		Measurement method correctly described?	NA																				
		Pls. kindly refer to CAR 9.																					
B.6.2.4. Parameter Title: Operating margin (OM) emission factor of the grid Note: OM should be calculated as per the procedures described in the “Tool to calculate the emission factor for an electricity system”	1,2,56	<table><tr><th>Data Checklist</th><th>Yes / No</th></tr><tr><td>Title in line with methodology?</td><td>Yes</td></tr><tr><td>Data unit correctly expressed?</td><td>No</td></tr><tr><td>Appropriate description?</td><td>No</td></tr><tr><td>Source clearly referenced?</td><td>Yes</td></tr><tr><td>Correct value provided?</td><td>Yes</td></tr><tr><td>Has this value been verified?</td><td>Yes</td></tr><tr><td>Choice of data correctly justified?</td><td>No</td></tr><tr><td>Measurement method correctly described?</td><td>NA</td></tr></table>		Data Checklist	Yes / No	Title in line with methodology?	Yes	Data unit correctly expressed?	No	Appropriate description?	No	Source clearly referenced?	Yes	Correct value provided?	Yes	Has this value been verified?	Yes	Choice of data correctly justified?	No	Measurement method correctly described?	NA	See CAR 9	<input checked="" type="checkbox"/>
Data Checklist	Yes / No																						
Title in line with methodology?	Yes																						
Data unit correctly expressed?	No																						
Appropriate description?	No																						
Source clearly referenced?	Yes																						
Correct value provided?	Yes																						
Has this value been verified?	Yes																						
Choice of data correctly justified?	No																						
Measurement method correctly described?	NA																						
B.6.2.5. Parameter Title: Build margin (BM) emission factor of the grid Note: BM should be calculated as per the procedures described in the “Tool to cal-	1,256	<table><tr><th>Data Checklist</th><th>Yes / No</th></tr><tr><td>Title in line with methodology?</td><td>Yes</td></tr></table>		Data Checklist	Yes / No	Title in line with methodology?	Yes	See CAR 9	<input checked="" type="checkbox"/>														
Data Checklist	Yes / No																						
Title in line with methodology?	Yes																						

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<p>culate the emission factor for an electricity system"</p>		Data unit correctly expressed?	No		
		Appropriate description of parameter?	No		
		Source clearly referenced?	Yes		
		Correct value provided?	Yes		
		Has this value been verified?	Yes		
		Choice of data correctly justified?	No		
		Measurement method correctly described?	NA		
<p>B.6.2.6. Parameter Title: fuel consumption of each power source</p>	<p>1,2, 56</p>			<p>See CAR 9</p>	<input checked="" type="checkbox"/>
		Data Checklist	Yes / No		
		Title in line with methodology?	No		
		Data unit correctly expressed?	Yes		
		Appropriate description of parameter?	Yes		
		Source clearly referenced?	Yes		
		Correct value provided?	Yes		
		Has this value been verified?	Yes		
		Choice of data correctly justified?	Yes		
		Measurement method correctly described?	NA		

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B.6.2.7. Parameter Title: emission coefficient of each fuel	1,2, 56			See CAR 9	<input checked="" type="checkbox"/>
		Data Checklist	Yes / No		
		Title in line with methodology?	No		
		Data unit correctly expressed?	No		
		Appropriate description of parameter?	Yes		
		Source clearly referenced?	Yes		
		Correct value provided?	Yes		
		Has this value been verified?	Yes		
		Choice of data correctly justified?	Yes		
		Measurement method correctly described?	NA		
B.6.2.8. Parameter Title: electricity generation of each power source	1,2, 56			See CAR 9	<input checked="" type="checkbox"/>
		Data Checklist	Yes / No		
		Title in line with methodology?	No		
		Data unit correctly expressed?	No		
		Appropriate description of parameter?	Yes		
		Source clearly referenced?	Yes		
		Correct value provided?	Yes		
		Has this value been verified?	Yes		
		Choice of data correctly justified?	Yes		
		Measurement method correctly described?	NA		

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B.6.2.9. Parameter Title: surface area of full reservoir level (for new hydroelectric activities only)	1,2, 56	<table><tr><th>Data Checklist</th><th>Yes / No</th></tr><tr><td>Title in line with methodology?</td><td>NA</td></tr><tr><td>Data unit correctly expressed?</td><td>NA</td></tr><tr><td>Appropriate description of parameter?</td><td>NA</td></tr><tr><td>Source clearly referenced?</td><td>NA</td></tr><tr><td>Correct value provided?</td><td>NA</td></tr><tr><td>Has this value been verified?</td><td>NA</td></tr><tr><td>Choice of data correctly justified?</td><td>NA</td></tr><tr><td>Measurement method correctly described?</td><td>NA</td></tr></table>	Data Checklist	Yes / No	Title in line with methodology?	NA	Data unit correctly expressed?	NA	Appropriate description of parameter?	NA	Source clearly referenced?	NA	Correct value provided?	NA	Has this value been verified?	NA	Choice of data correctly justified?	NA	Measurement method correctly described?	NA		
Data Checklist	Yes / No																					
Title in line with methodology?	NA																					
Data unit correctly expressed?	NA																					
Appropriate description of parameter?	NA																					
Source clearly referenced?	NA																					
Correct value provided?	NA																					
Has this value been verified?	NA																					
Choice of data correctly justified?	NA																					
Measurement method correctly described?	NA																					
B.6.2.10. Parameter Title: fraction of time with low costs /must run plant at the margin (for simple adjusted OM only)	1,2	<table><tr><th>Data Checklist</th><th>Yes / No</th></tr><tr><td>Title in line with methodology?</td><td>No</td></tr><tr><td>Data unit correctly expressed?</td><td>Yes</td></tr><tr><td>Appropriate description of parameter?</td><td>Yes</td></tr><tr><td>Source clearly referenced?</td><td>Yes</td></tr><tr><td>Correct value provided?</td><td>Yes</td></tr><tr><td>Has this value been verified?</td><td>Yes</td></tr><tr><td>Choice of data correctly justified?</td><td>Yes</td></tr><tr><td>Measurement method correctly described?</td><td>Yes</td></tr></table>	Data Checklist	Yes / No	Title in line with methodology?	No	Data unit correctly expressed?	Yes	Appropriate description of parameter?	Yes	Source clearly referenced?	Yes	Correct value provided?	Yes	Has this value been verified?	Yes	Choice of data correctly justified?	Yes	Measurement method correctly described?	Yes	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Data Checklist	Yes / No																					
Title in line with methodology?	No																					
Data unit correctly expressed?	Yes																					
Appropriate description of parameter?	Yes																					
Source clearly referenced?	Yes																					
Correct value provided?	Yes																					
Has this value been verified?	Yes																					
Choice of data correctly justified?	Yes																					
Measurement method correctly described?	Yes																					

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B.6.2.11. Parameter Title: electricity imports	1,2	<table><tr><th>Data Checklist</th><th>Yes / No</th></tr><tr><td>Title in line with methodology?</td><td>NA</td></tr><tr><td>Data unit correctly expressed?</td><td>NA</td></tr><tr><td>Appropriate description of parameter?</td><td>NA</td></tr><tr><td>Source clearly referenced?</td><td>NA</td></tr><tr><td>Correct value provided?</td><td>NA</td></tr><tr><td>Has this value been verified?</td><td>NA</td></tr><tr><td>Choice of data correctly justified?</td><td>NA</td></tr><tr><td>Measurement method correctly described?</td><td>NA</td></tr></table>	Data Checklist	Yes / No	Title in line with methodology?	NA	Data unit correctly expressed?	NA	Appropriate description of parameter?	NA	Source clearly referenced?	NA	Correct value provided?	NA	Has this value been verified?	NA	Choice of data correctly justified?	NA	Measurement method correctly described?	NA	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Data Checklist	Yes / No																					
Title in line with methodology?	NA																					
Data unit correctly expressed?	NA																					
Appropriate description of parameter?	NA																					
Source clearly referenced?	NA																					
Correct value provided?	NA																					
Has this value been verified?	NA																					
Choice of data correctly justified?	NA																					
Measurement method correctly described?	NA																					
B.6.2.12. Parameter Title: CO <sub>2</sub> emission coefficient of fuels used in connected grids	1,2	<table><tr><th>Data Checklist</th><th>Yes / No</th></tr><tr><td>Title in line with methodology?</td><td>No</td></tr><tr><td>Data unit correctly expressed?</td><td>No</td></tr><tr><td>Appropriate description of parameter?</td><td>Yes</td></tr><tr><td>Source clearly referenced?</td><td>Yes</td></tr><tr><td>Correct value provided?</td><td>Yes</td></tr><tr><td>Has this value been verified?</td><td>Yes</td></tr><tr><td>Choice of data correctly justified?</td><td>Yes</td></tr><tr><td>Measurement method correctly described?</td><td>NA</td></tr></table>	Data Checklist	Yes / No	Title in line with methodology?	No	Data unit correctly expressed?	No	Appropriate description of parameter?	Yes	Source clearly referenced?	Yes	Correct value provided?	Yes	Has this value been verified?	Yes	Choice of data correctly justified?	Yes	Measurement method correctly described?	NA	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Data Checklist	Yes / No																					
Title in line with methodology?	No																					
Data unit correctly expressed?	No																					
Appropriate description of parameter?	Yes																					
Source clearly referenced?	Yes																					
Correct value provided?	Yes																					
Has this value been verified?	Yes																					
Choice of data correctly justified?	Yes																					
Measurement method correctly described?	NA																					
B.6.3. Ex-ante calculation of emission reductions																						

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B.6.3.1. Is the projection based on the same procedures as used for future monitoring? What kind of procedure is used?	1,2	Yes. Being a hydropower project, the net electricity to grid is the required parameter for both baseline calculation and future monitoring.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.6.3.2. Are the GHG calculations documented in a complete and transparent manner?	1,2	Yes, they are.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.6.3.3. If there is more than one component of the project activity, then, are emission reduction calculations provided separately for each component?	1,2	There is only a plant, so the emission reduction calculation is only one.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.6.3.4. Is the data provided in this section consistent with data as presented in other chapters of the PDD?	1,2	Yes, the data is consistent through the entire PDD.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<b>B.6.4. Summary of the ex-ante estimation of emission reductions</b>				
B.6.4.1. Will the project result in fewer GHG emissions than the baseline scenario?	1,2	As demonstrated in the PDD, the proposed project is a run-of-river hydro project, given that there is no flooded area associated with the project activity, it is not necessary to calculate the power density and there are no Project Emissions. Moreover, there is no need to consider leakage because there is no energy generating equipment transferred from another activity and no existing equipment transferred to another activity. Thus, the emission reduction is equal to the baseline scenario.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.6.4.2. Is the form/table required for the indication of projected emission reductions correctly applied?	1,2	Yes, the table is complete, which includes the emission due to the project activity, baseline emission, leakage emission and the overall emission reduction. However, Pls. kindly refer to CAR 5.	See CAR 5	<input checked="" type="checkbox"/>
B.6.4.3. If the project activity involves more than one component, is separate table included for each of the component.	1,2	Pls. refer to B.6.3.3. of protocol.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.6.4.4. Do these values comply with small-scale criteria for every year?	1,2	Yes, they do.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>



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B.6.4.5. Is the projection in line with the envisioned time schedule for the project's implementation and the indicated crediting period?	1,2	The life time of the project is expected to be 25 years and the fixed crediting period of 10 years. The yearly emission reduction and total emission reduction are indicated in B.6.4.of PDD. However, Pls. kindly refer to CAR 5	See CAR 5	<input checked="" type="checkbox"/>								
B.6.4.6. Is the data provided in this section in consistency with data as presented in other chapters of the PDD?	1,2	The data is consistent in the PDD which is used for on site assessment. However, Pls. kindly refer to CAR 4.	See CAR 4	<input checked="" type="checkbox"/>								
<b>B.7. Application of the monitoring methodology and description of the monitoring plan</b>												
B.7.1. <i>Data and parameters monitored</i>												
B.7.1.1. Is the list of parameters presented in chapter B.7.1 considered to be complete with regard to the requirements of the applied methodology?	1,2, 56	Yes, the electricity supplied to grid will be measured and recorded. However, <b><u>Corrective Action Request No.10.</u></b> <ul style="list-style-type: none"><li>- The accuracy of electricity meters shall be described in the revised PDD.</li><li>- Pls. kindly add the grid connection and meters diagram in PDD.</li><li>- National standard for meters calibration should be mentioned</li></ul>	CAR10	<input checked="" type="checkbox"/>								
Comment on any line answered with "No"												
B.7.1.1.1. Parameter Title: Electricity generated by the renewable technology	1,2, 56	<table><tr><th>Monitoring Checklist</th><th>Yes / No</th></tr><tr><td>Title in line with methodology?</td><td>Yes</td></tr><tr><td>Data unit correctly expressed?</td><td>Yes</td></tr><tr><td>Appropriate description of parameter?</td><td>Yes</td></tr></table>	Monitoring Checklist	Yes / No	Title in line with methodology?	Yes	Data unit correctly expressed?	Yes	Appropriate description of parameter?	Yes	See CAR10	<input checked="" type="checkbox"/>
Monitoring Checklist	Yes / No											
Title in line with methodology?	Yes											
Data unit correctly expressed?	Yes											
Appropriate description of parameter?	Yes											

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		<table><tr><td>Source clearly referenced?</td><td>Yes</td></tr><tr><td>Correct value provided for estimation?</td><td>Yes</td></tr><tr><td>Has this value been verified?</td><td>Yes</td></tr><tr><td>Measurement method correctly described?</td><td>No</td></tr><tr><td>Correct reference to standards?</td><td>No</td></tr><tr><td>Indication of accuracy provided?</td><td>Yes</td></tr><tr><td>QA/QC procedures described?</td><td>Yes</td></tr><tr><td>QA/QC procedures appropriate?</td><td>Yes</td></tr></table>	Source clearly referenced?	Yes	Correct value provided for estimation?	Yes	Has this value been verified?	Yes	Measurement method correctly described?	No	Correct reference to standards?	No	Indication of accuracy provided?	Yes	QA/QC procedures described?	Yes	QA/QC procedures appropriate?	Yes										
Source clearly referenced?	Yes																											
Correct value provided for estimation?	Yes																											
Has this value been verified?	Yes																											
Measurement method correctly described?	No																											
Correct reference to standards?	No																											
Indication of accuracy provided?	Yes																											
QA/QC procedures described?	Yes																											
QA/QC procedures appropriate?	Yes																											
		Pls. kindly refer to CAR 10.																										
B.7.1.1.2. Amount of biomass input (if applicable)	1,2	<table><tr><th>Monitoring Checklist</th><th>Yes / No</th></tr><tr><td>Title in line with methodology?</td><td>N.A.</td></tr><tr><td>Data unit correctly expressed?</td><td>N.A.</td></tr><tr><td>Appropriate description of parameter?</td><td>N.A.</td></tr><tr><td>Source clearly referenced?</td><td>N.A.</td></tr><tr><td>Correct value provided for estimation?</td><td>N.A.</td></tr><tr><td>Has this value been verified?</td><td>N.A.</td></tr><tr><td>Measurement method correctly described?</td><td>N.A.</td></tr><tr><td>Correct reference to standards?</td><td>N.A.</td></tr><tr><td>Indication of accuracy provided?</td><td>N.A.</td></tr><tr><td>QA/QC procedures described?</td><td>N.A.</td></tr><tr><td>QA/QC procedures appropriate?</td><td>N.A.</td></tr></table>	Monitoring Checklist	Yes / No	Title in line with methodology?	N.A.	Data unit correctly expressed?	N.A.	Appropriate description of parameter?	N.A.	Source clearly referenced?	N.A.	Correct value provided for estimation?	N.A.	Has this value been verified?	N.A.	Measurement method correctly described?	N.A.	Correct reference to standards?	N.A.	Indication of accuracy provided?	N.A.	QA/QC procedures described?	N.A.	QA/QC procedures appropriate?	N.A.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Monitoring Checklist	Yes / No																											
Title in line with methodology?	N.A.																											
Data unit correctly expressed?	N.A.																											
Appropriate description of parameter?	N.A.																											
Source clearly referenced?	N.A.																											
Correct value provided for estimation?	N.A.																											
Has this value been verified?	N.A.																											
Measurement method correctly described?	N.A.																											
Correct reference to standards?	N.A.																											
Indication of accuracy provided?	N.A.																											
QA/QC procedures described?	N.A.																											
QA/QC procedures appropriate?	N.A.																											
B.7.1.1.3. Amount of fossil fuel (if applicable)	1,2	<table><tr><th>Monitoring Checklist</th><th>Yes / No</th></tr><tr><td>Title in line with methodology?</td><td>N.A.</td></tr><tr><td>Data unit correctly expressed?</td><td>N.A.</td></tr><tr><td>Appropriate description of parameter?</td><td>N.A.</td></tr><tr><td>Source clearly referenced?</td><td>N.A.</td></tr><tr><td>Correct value provided for estimation?</td><td>N.A.</td></tr><tr><td>Has this value been verified?</td><td>N.A.</td></tr></table>	Monitoring Checklist	Yes / No	Title in line with methodology?	N.A.	Data unit correctly expressed?	N.A.	Appropriate description of parameter?	N.A.	Source clearly referenced?	N.A.	Correct value provided for estimation?	N.A.	Has this value been verified?	N.A.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>										
Monitoring Checklist	Yes / No																											
Title in line with methodology?	N.A.																											
Data unit correctly expressed?	N.A.																											
Appropriate description of parameter?	N.A.																											
Source clearly referenced?	N.A.																											
Correct value provided for estimation?	N.A.																											
Has this value been verified?	N.A.																											

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		Measurement method correctly described?	N.A.		
		Correct reference to standards?	N.A.		
		Indication of accuracy provided?	N.A.		
		QA/QC procedures described?	N.A.		
		QA/QC procedures appropriate?	N.A.		
<b>B.7.2. Description of the monitoring plan</b>					
B.7.2.1. Is the operational and management structure clearly described and in compliance with the envisioned situation?	1,2	The project owner, HYDELEC, will take the responsibility of the monitoring plan implementation.		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.7.2.2. Are responsibilities and institutional arrangements for data collection and archiving clearly provided?	1,2	Yes they are; the staff will watch operation status of metering equipments daily. Designated staff will furthermore collect the measured electricity on a monthly basis and complete the corresponding record. This will be checked by the company administrator.		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.7.2.3. Does the monitoring plan provide current good monitoring practice?	1,2	The staff concerned will receive training on monitoring and measurement to ensure the implementation of the monitoring plan. Calibration of meters will occur annually according to national standards.		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.7.2.4. If applicable: Does annex 4 provide useful information enabling a better understanding of the envisioned monitoring provisions?	1,2	Not applicable.		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<b>B.8. Date of completion of the application of the baseline study and monitoring methodology an the name of the responsible person(s)/entity(ies)</b>					
B.8.1.1. Is there any indication of a date when the baseline was determined?	1,2	Yes, the completion date is May 13rd, 2008.		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.8.1.2. Has dd/mm/yyyy format been used to indi-	1,2,	No, it has not.		CAR11	<input checked="" type="checkbox"/>

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cate the date.	56	<b><u>Corrective Action Request No.11.</u></b> pls. correct the format of the date.		
B.8.1.3. Is this consistent with the time line of the PDD history?	1,2	Yes it is.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.8.1.4. Is the information on the person(s) / entity (ies) responsible for the application of the baseline and monitoring methodology provided consistent with the actual situation?	1,2	Yes it is.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.8.1.5. Is information provided whether this person / entity is also considered a project participant?	1,2	The person/entities of determining baseline are not project participants.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<b>C. Duration of the project activity / crediting period</b>				
<b>C.1. Duration of the project activity</b>				
C.1.1. Are the project's starting date and operational lifetime clearly defined and reasonable? Is it the earliest date of construction, implementation or real action?	1,2, 44, 56	The project's starting date is defined as 1/08/2008: <b><u>Corrective Action Request No.12.</u></b> The date in section C.1.1 must be the earliest date of construction or even the first day in which real action has taken place. Please correct the date.	CAR12	<input checked="" type="checkbox"/>
<b>C.2. Choice of the crediting period and related information</b>				
C.2.1. Is the assumed crediting time clearly defined and reasonable (renewable crediting period of max 7 years with potential for 2 renewals or fixed crediting period of max. 10 years)?	1,2	The life time of the project is 30 years. Therefore, the 10 years is chosen as the fixed crediting period.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
C.2.2. Has dd/mm/yyyy format been used to indicate the start date of the crediting period.	1,2	Yes, it is.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

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<b>D. Environmental impacts</b>				
<b>D.1. If required by the host Party, documentation on the analysis of the environmental impacts of the project activity:</b>				
D.1.1. Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, has an EIA been approved? If yes answer also D.1.2 to D.1.4	1,2, 43	According to the national legislation, SHPP is not subject of an EIA. Nevertheless, HYDELEC assigned SAGETEC in 2001 with an EIA. The relative evidence has been provided by the project participants.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
D.1.2. Has the analysis of the environmental impacts of the project activity been sufficiently described?	1,2, 43	Yes, a matrix on the environmental impacts of the project activity such as air quality, soil, Fauna, Flora, Social, Economy and water is reported in PDD. Furthermore impacts on physical and socio-economic components are developed.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
D.1.3. Will the project create any adverse environmental effects?	1,2	Such as reported in PDD, the environmental impacts of the project are considered minimal and insignificant as mentioned above, and are more evident during the construction phase of the project.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
D.1.4. Were transboundary environmental impacts identified in the analysis?	1,2	Not applicable.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<b>D.2. If environmental impacts are considered significant by the project participants or the host Party, please provide conclusions and all references to support documentation of an environmental impact assessment undertaken in accordance with the procedures as required by the host Party</b>				
D.2.1. Have the identified environmental impacts been addressed in the project design sufficiently?	1,2	Not applicable.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
D.2.2. Does the project comply with environmental legislation in the host country?	1,2	Not applicable.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<b>E. Stakeholders' comments</b>				
<b>E.1. Brief description how comments by local stakeholders have been invited and compiled</b>				
E.1.1. Have relevant stakeholders been consulted?	1,2	Public consultation took place in the framework of the EIA exe-	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

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		cuted in November 2001 and comprised meetings with stakeholders on site and interviews .		
E.1.2. Have appropriate media been used to invite comments by local stakeholders?	1,2, 54, 56	Newspaper publication for the consultation process has been used. However, <b><u>Clarification Request No. 4.</u></b> Pls. deliver the evidence to audit team.	CR 4	<input checked="" type="checkbox"/>
E.1.3. If a stakeholder consultation process is required by regulations/laws in the host country, has the stakeholder consultation process been carried out in accordance with such regulations/laws?	1,2	No consultation process is required by the local legislation.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
E.1.4. Is the undertaken stakeholder process that was carried out described in a complete and transparent manner?	1,2, 54, 56	<b><u>Corrective Action Request No.13.</u></b> Pls. develop better how the stakeholder process was carried out and more detailed information on the relative outcome.	CAR13	<input checked="" type="checkbox"/>
<b>E.2.Summary of the comments received</b>				
E.2.1. Is a summary of the received stakeholder comments provided?	1,2	A summary of the stakeholder comments is provided, however Pls. kindly refer to CAR 13.	See CAR13	<input checked="" type="checkbox"/>
<b>E.3.Report on how due account was taken of any comments received</b>				
E.3.1. Has due account been taken of any stakeholder comments received?	1,2, 17	As response to the concerns raised by the local population, HY-DELEC will compensate the use of arable land for the project by refunding at a double or triple price the missed income from agriculture and the acquisition of the territory and the right to reuse the arable land for agriculture. Furthermore the project developer implemented security measures and conserves local biodiversity by planting local 40.000 trees on the project site.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<b>F. Annexes 1 – 4</b>				

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F.1. Annex 1: Contact Information				
F.1.1. Is the information provided consistent with the one given under section A.3?	1,2	Yes, it is.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
F.1.2. Is the information on all private participants and directly involved Parties presented?	1,2	Yes, it is.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
F.2. Annex 2: Information regarding public funding				
F.2.1. Is the information provided on the inclusion of public funding (if any) in consistency with the actual situation presented by the project participants?	1,2	Pls. see A.4.4. of protocol.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
F.2.2. If necessary: Is an affirmation available that any such funding from Annex-I-countries does not result in a diversion of ODA?	1,2	Not applicable.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
F.3. Annex 3: Baseline information				
F.3.1. If additional background information on baseline data is provided: Is this information consistent with data presented by other sections of the PDD?	1,2	Yes, it is.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
F.3.2. Is the data provided verifiable? Has sufficient evidence been provided to the validation team?	1,2, 25, 33, 35	The data have been included in PDD together with the relative sources from JIRAMA, the local grid company. However, <b><u>Clarification Request No. 5.</u></b> The raw data that have been used for the baseline calculations should be provided as evidence.	CR 5	<input checked="" type="checkbox"/>
F.3.3. Does the additional information substantiate / support statements given in other sections of the PDD?	1,2	Yes, it is.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
F.4. Annex 4: Monitoring information				



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F.4.1. If additional background information on monitoring is provided: Is this information consistent with data presented in other sections of the PDD?	1,2	Not applicable.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
F.4.2. Is the information provided verifiable? Has sufficient evidence been provided to the validation team?	1,2	Not applicable.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
F.4.3. Do the additional information and / or documented procedures substantiate / support statements given in other sections of the PDD?	1,2	Not applicable.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

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**Table 2 Resolution of Corrective Action and Clarification Requests**

Clarifications and corrective action requests by validation team	Ref. to table 1	Summary of project owner response	Validation team conclusion
<b>CAR</b>			
<b><u>Corrective Action Request No.1.</u></b> Pls. add the Revision History of PDDs in A.1	A.1.3	The revision history has been inserted to A.1 of the PDD.	☑ Relevant information has been included in final PDD
<b><u>Corrective Action Request No.2.</u></b> Pls. specify in the PDD from which countries the equipment was imported and from which society.	A.4.2.4	The required information has been specified in the PDD. Turbines, generators and related equipment such as inlet and outlet valve are supplied by Hunan Lingling Hengyuan Generating Equipment Co., Ltd., (China). The Foreign Trade Sales Contract dated 24/04/2007 is enclosed in Enclosure 17 (confidential). Cables, transformer stations and related equipment are supplied by BP Automation. For the Pro Forma Bill dated 25/06/2007, see Enclosure 18 (confidential).	☑ Related evidences have been provided (IRL 9 and 10) and the information could be confirmed.
<b><u>Corrective Action Request No.3.</u></b> The "Rated flow" of the Turbine as indicated in PDD is not consistent with the same in the subscribed purchasing agreement for turbine and generator. The inconsistency should be corrected.	A.4.2.6	The rated flow indicated with 4.17 m <sup>3</sup> /s in the PDD has been corrected to 3.17 m <sup>3</sup> /s according to the China Foreign Trade Sales Contract dated 24/04/2007 (see Enclosure 17).	☑ The inconsistency has been resolved.
<b><u>Corrective Action Request No.4.</u></b> The time schedule of the implementation of the power plant should be included into the PDD.	A.4.2.11	A time schedule of the implantation comprising authorisation, conclusion of power purchase agreement with JIRAMA; project financing, construction until start of operation is enclosed in table 2. In section B.5 this time schedule is put in relation with the CDM steps.	☑ A time schedule has been included and related evidences have been made available to the validator.

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<b><u>Corrective Action Request No.5.</u></b> Pls. specify each year in table 2 according to the format dd/mm/yyyy – dd/mm/yyyy	A.4.3.1 B.6.4.2 B.6.4.5 B.6.4.6	The data format in table 3 (former table 2) has been revised according to the correct format.	<input checked="" type="checkbox"/>
<b><u>Corrective Action Request No.6.</u></b> <ul style="list-style-type: none"> <li>- Pls. add where the methodology could be found</li> <li>- Pls. specify the tool that it is used in PDD for the baseline calculation</li> </ul>	B.1.1.1 B.1.1.2 B.6.1.1 B.6.1.4 B.6.1.6	The tool for the baseline calculation was specified as well as the website address where the methodology can be found. The calculation of the GHG emission reductions by the proposed project follows the baseline methodology AMS I.D. (version 13) and the “Tool to calculate the emission factor for an electricity system” (version 01.1).	<input checked="" type="checkbox"/> Related information has been provided.
<b><u>Corrective Action Request No.7.</u></b> All the feasible scenarios shall be completely listed and the reason for excluding the other scenarios shall be given in the revised PDD.	B.4.1 B.4.2 B.4.3 B.4.4 B.4.5 B.4.6	All feasible scenarios are completely listed, reference is made to the most relevant legal requirements and reasons are given for the exclusion of scenarios.	<input checked="" type="checkbox"/> This section has been revised and information made available o the validator.
<b><u>Corrective Action Request No.8.</u></b> Pls. add a list of key events from the very first project ideas to the decision to apply for CDM and the starting of the project activities. Dates and relative evidences should be provided.	B.5.14	In Table 11 of section B.5 the chronology of CDM activities is listed together with other project milestones. Evidence of the most relevant milestones has been provided to the DOE.	<input checked="" type="checkbox"/> It's confirmed the timeline as evidenced in final PDD.
<b><u>Corrective Action Request No.9.</u></b> Pls. refer to the following B.6.2.2 – B.6.2.12 in protocol to complete the parameter list which are required as per methodology.	B.6.2.1 B.6.2.3 B.6.2.4 B.6.2.5 B.6.2.6	The parameter list has been completed as required in methodology AMS I.D. (version 13). The structure and wording has been changed accordingly.	<input checked="" type="checkbox"/>

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	B.6.2.7 B.6.2.8		
<b><u>Corrective Action Request No.10.</u></b> <ul style="list-style-type: none"> <li>- The accuracy of electricity meters shall be described in the revised PDD.</li> <li>- Pls. kindly add the grid connection and meters diagram in PDD.</li> <li>- National standard for meters calibration should be mentioned</li> </ul>	B.7.1.1 B.7.1.1.1	<p>The grid connection and meters diagram has been added as figure 2 in the revised PDD.</p> <p>Information on the accuracy of the electricity meters and the national calibration standard have been inserted.</p> <p><b>Response to follow-up:</b></p> <p>The diagram has been now revised according to the request.</p>	<p>A grid connection and meters diagram has been included in the revised PDD. However,</p> <p><b><u>Follow up 1:</u></b></p> <p>the position of the meters should be better identified in the diagram.</p> <p><input checked="" type="checkbox"/></p> <p>The diagram allows now a clear understanding of meters location.</p>
<b><u>Corrective Action Request No.11.</u></b> Pls. correct the date format.	B.8.1.2	<p>The data format has been corrected according to the correct format.</p>	<p><input checked="" type="checkbox"/></p> <p>Resolved</p>
<b><u>Corrective Action Request No.12.</u></b> The date in section C.1.1 must be the earliest date of construction or even the first day in which real action has taken place. Please correct the date.	C.2.1	<p>Construction started on 01/04/2007. Hence, the start of the project activity was changed to this date.</p> <p><b>Response to follow-up:</b></p> <p>Evidence of the construction commencement has been delivered to the DOE</p>	<p>No evidence could be found regarding the starting date of the project activity as defined in revised PDD.</p> <p><b><u>Follow up 1:</u></b></p> <p>Evidence of the construction commencement should be provided in order to further substantiate the starting date of the project activity as per "CDM Glossary of Terms"</p> <p><input checked="" type="checkbox"/></p> <p>According to the evidence provided, it's confirmed that</p>

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			the starting date of the project activity has been correctly defined.
<b><u>Corrective Action Request No.13.</u></b> Pls. develop better how the stakeholder process was carried out and more detailed information on the relative outcome.	E.1.4 E.2.1	Several documents are mentioned in the updated PDD and have been submitted to the DOE to underline how the stakeholder process was carried out and provide information on the relative outcome:  Furthermore, the National Authority of Water and Sanitation has been added as additional stakeholder.	<input checked="" type="checkbox"/> This section has been revised in final PDD and related information could be checked by the audit team (IRL 54 and 55)
<b>CR</b>			
<b><u>Clarification Request No. 1.</u></b> Pls. deliver the related training evidence, such as, training schedule, training material to audit team.	A.4.2.9 A.4.2.10	The operation manual can be found in Enclosure 27. The training evidence at the Advanced Institute for Technology is Enclosure 28. Enclosure 34 is the evidence for the training including list of participants and content which were conducted in 2008 by Hunan Lingling Hengyuan Generating Equipment Co., Ltd., (China) and BP Automation (France).	<input checked="" type="checkbox"/> The requested evidences have been provided and checked by the validator (IRL 16, 31)
<b><u>Clarification Request No. 2.</u></b> Pls. deliver the related evidence on public funding to DOE.	A.4.4.1	The evidence of AfDB funding is mentioned in the PDD and has been submitted to the DOE. We can name you the AfDB contact person if requested.	<input checked="" type="checkbox"/> Evidence of the AfDB funding has been provided (IRL 29)
<b><u>Clarification Request No. 3.</u></b> It should be better clarified in the PDD the reason for the application of the project as a CDM and how the barriers could be overcome.	B.5.19	Section B.5 has been completely updated and includes now the investment analysis and explains the main risks (JIRAMA's weak financial situation) and barriers (project financing, policy and capacity barriers) and shows that with CDM these could be overcome.	<input checked="" type="checkbox"/> A complete list of barriers including Investment barrier analysis has been developed. The information provided has been assessed by the audit team based on several evidences as mentioned in section 3.6 of Validation Report.
<b><u>Clarification Request No. 4.</u></b> Pls. deliver the evidence of the newspaper	E.1.2	Various articles published in newspapers on the Sahainivotry project in year 2007 can be found in Enclosure 2.	<input checked="" type="checkbox"/> Relevant evidences has been

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publication for the consultation process to audit team.			provided (IRL 54), demonstrating that the project implementation was channelled through several publications in local newspaper and magazines.
<b><u>Clarification Request No. 5.</u></b> The raw data that have been used for the baseline calculations should be provided as evidence.	F.3.2	The relevant raw data used for the baseline calculations has been submitted to the DOE (Enclosures 21 to 25 and 33).	<input checked="" type="checkbox"/> Evidences of the basis for baseline calculation were provided (IRL 21, 25, 33)


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## **Annex 2: Information Reference List**




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Ref. No.	Author/Editor/ Issuer	Title/Type of Document. Publication place	Issuance and/or submission date (dd/mm/yyyy)	Additional Information (Relevance in CDM Context)
		Onsite interview (19.05.2008 - 20.05.2008) carried out by TÜV SÜD: Validation Team: Luciano Grugni TÜV Italia – TÜV SÜD Group, GHG Auditor Riccardo Arena TÜV Italia – TÜV SÜD Group, GHG Auditor  Interviewed Persons: Elvira Lutter Pöry Energy GmbH Jean Pierre Sanchis Hydelec Madagascar SA		On site audit
0.	TÜV SÜD netinform webpage	“Sahanivotry Hydro Power Plant, Madagascar” <a href="http://www.netinform.de/KE/Wegweiser/Guide2_1.aspx?ID=4890&amp;Ebene1_ID=26&amp;Ebene2_ID=1506&amp;mode=1">http://www.netinform.de/KE/Wegweiser/Guide2_1.aspx?ID=4890&amp;Ebene1_ID=26&amp;Ebene2_ID=1506&amp;mode=1</a>	17/05/2009	GSP webpage
1.	Pöry Energy GmbH	Project Design Document for CDM project “Sahanivotry Hydro Power Plant, Madagascar“, version 01	13/05/2008	GSP - PDD
2.	UNFCCC	Indicative simplified baseline and monitoring methodologies for selected small-scale CDM project activity categories, AMS-I.D., version 13		UNFCCC SSC Methodology
3.	TÜV SÜD	Participant list of on-site interview	19/05/2008	On site audit
4.	Hydelec	Project Idea Note (PIN): Madagascar – Sahanivotry Hydro Power Plant	09/07/2007	Timeline: CDM continuous action
5.	Pöry Energy GmbH	Proposal for Developing the hydropower plant Sahanivotry (Madagascar) under the CDM	24/05/2006	CDM consideration
6.	Ministry of Environment, Water and Forests, National Focal Point for the Climate Change Convention	Lettre d'éligibilité pour le document d'idée de project (DIP) relative à la Centrale hydroélectrique de Sahanivotry de la Société HYDELEC	18/09/2007	CDM consideration
7.		E-mail exchange between Bernard Meunier and DG Hydelec “Dossier Fond	10/04/2007	CDM consideration

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Ref. No.	Author/Editor/ Issuer	Title/Type of Document. Publication place	Issuance and/or submission date (dd/mm/yyyy)	Additional Information (Relevance in CDM Context)
		Carbonne / Hydelec Madagascar"		
8.	Autorité Nationale de l'eau e de l'Assainissement	Permis de Prélèvement d'eau au droit de la station hydroélectrique à Sahanivotry sut la rivière Sahanivotry,	21/05/2007	Timeline: project implementation approval
9.	Hunan Lingling Hengyuan Generating Equipment Co.,Ltd and Hydelec Madagascar S.A.	Purchasing Contract for Turbine and Generator between dated 24/04/2007ANDEA, n°132-07	24/04/2007	Timeline evidence
10.	BP Automation	Facture Pro Forma from BP Automation related to the purchasing of "Etude, Cablage et Automatization d'une Centrale Hydroelectrique de 3x5.5 MW Sur Le Site de Sahanivotry"	25/06/2007	
11.	Ministre de l'Energie	Decision n° 046 – ME/SG/DG/DEN/SRSA.CE portant Autorisation Environnementale	21/06/2007	Environmental Authorization
12.	Ministere de l'Energie à Monsier le Directeur Général Société Hydelec Madagascar	Letter n°40 ME/SG/DG/DEN. Confirmation of the validity of the project authorization previously signed in 2001 (see IRL 45).	07/03/2007	Timeline evidence: starting construction authorization
13.	Le Ministre de L'Energie et de Mines	Arrêté N° 21-016/2007 aurorisant une augmentation de la puissance de la central hydroélectrique de Sahanivotry (augmentasion de 5 MW)	28/11/2007	Formal authorization to the 5MW capacity addition
14.	Ministere de l'Environnement, Des Aux et Forêt (Madagascar DNA)	Lettre d'éligibilité pour le document d'idée de project (DIP) relative à la Centrale hydroélectrique de Sahanivotry de la Société HYDELEC	16/10/2007	Timeline: continuous consideration of the CDM
15.	Jirama S.A. et Hydelec Madagascar S.A.	Avenant n° 3 Au contract d'achat d'énergie de la Centrale de Sahanivotry	16/08/2007	Timeline: 3 <sup>rd</sup> amendment to PPA. Investment barrier analysis: grid price assumptions

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16.	Entre L'Institut Supérieur De Technologie D'Antananarivo et L'Entreprise Hydelec Madagaskar S.A.	Convention Validant l'inscription de n° 04/04/IST-T/DG	27/01/2004	Training evidence for Mr. Dimbinasandratratolotsoa,
17.	Sahanivotry Municipality /Hydelec Madagascar SA	Land Compensation Evidence	9/01/2004	Land compensation
18.	Government Document	Public information regarding the absence of negative impacts for the agriculture, deriving from the proposed project activity	25/04/2007	Environmental Impacts
19.	Sahanivotry Municipality	List of the persons that took part in the public consultations meetings	20/05/2008	Stakeholder involvement
20.	Austrian Federal Ministry of Agriculture, Forestry, Environment and Water Management	Letter of Approval for the CDM Project Activity "Small-Scale Hydropower Project Sahanivotry in Madagascar"	02/02/2010	Letter of approval Austrian DNA
21.	Jirama S.A.	Load forecast 2008/2009, Peak load per month 2006/2007, Load curve 11/06/2006 resp. 18/06/2007	24/03/2008	
22.	BFV-Society General, The Mauritius Commercial Bank (Madagascar) and Hydelec Madagascar	Loan agreement between BFV-Society General, "The Mauritius Commercial Bank (Madagascar) and Hydelec Madagascar	06/09/2007	Bank Loan
23.	Jirama S.A. and Hydelec Madagascar S.A.	Contrat d'achat d'énergie	17/02/2001	Power Purchase Agreement
24.	Energy Engineering Investment Ltd. and	Confirmation on Change of Project Participant	11/03/2009	Change of PP from Energy Engineering Investment Ltd.

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Ref. No.	Author/Editor/ Issuer	Title/Type of Document. Publication place	Issuance and/or submission date (dd/mm/yyyy)	Additional Information (Relevance in CDM Context)
	Hydelec Madagascar			to Hydelec Madagascar SA
25.	Jirama S.A.	Production per existing power plant in RITANA	11/01/2008	Baseline emissions (EF calculation)
26.	Web Portal – Tafatafa tafatafa.eu.org	La centrale hydroélectrique de Sahanivotry	16/06/2005	Barrier analysis: critical project financing. Initial involvement of German bank Deutsche Investitions- und Entwicklungsgesellschaft mbH (DEG)
27.	Jirama S.A.	Production park RI TANA 2008-2030 per power plant	11/01/2008	
28.	Hydelec Madagascar SA	Grid connection and meters diagram	01/04/2009	Project boundary
29.	African Development Bank Group	Project Brief – Madagascar, Sahanivotry Small Hydro Power	28/05/2007	Timeline: CDM continuous consideration
30.	Hydelec Madagascar SA	Operation manual	01/04/2008	
31.	Hydelec Madagascar SA	Training schedule incl. list of participants	14/10/2009	Monitoring Plan: training schedule
32.	Jirama S.A.	Electricity Demand Forecast	11/01/2008	

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Ref. No.	Author/Editor/ Issuer	Title/Type of Document. Publication place	Issuance and/or submission date (dd/mm/yyyy)	Additional Information (Relevance in CDM Context)
33.	Ministry of Energy and Mines	Least Cost Development Plan for the grid , hydropower project and other energy sources, final report.	01/08/2005	Identification of the baseline scenario – baseline calculation
34.	African Development Bank	Projected annual electricity generation	2006	Investment analysis: 12 months power production
35.	Jirama S.A.	Structure of existing production Park RITANA	11/01/2008	Baseline emissions (EF calculation) Barrier analysis: hydro plants park
36.	Hydelec / Kommunalkredit Public Consulting	Modalities of Communication Form	10/2009	Modalities of Communication
37.	Jirama S.A. et Hydelec Madagascar S.A.	Avenant n° 1 Au contract d'achat d'énergie de la Centrale de Sahanivotry	27/06/2001	Timeline: 1 <sup>st</sup> amendment to PPA Investment barrier analysis: grid price assumptions.
38.	Jirama S.A. et Hydelec Madagascar S.A.	Avenant n° 2 Au contract d'achat d'énergie de la Centrale de Sahanivotry	16/10/2006	Timeline: 2 <sup>nd</sup> amendment to PPA. Investment barrier analysis: grid price assumptions.
39.	Pöyry Energy GmbH	Sahanivotry project IRR	11/2009	Investment barrier analysis: IRR calculation spreadsheet
40.	Pöyry Energy GmbH	Comparison of AfDB 2006 financial model and the PDD investment analysis	09/11/2009	Investment barrier analysis: IRR data source crosscheck


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Ref. No.	Author/Editor/ Issuer	Title/Type of Document. Publication place	Issuance and/or submission date (dd/mm/yyyy)	Additional Information (Relevance in CDM Context)
41.	African Development Bank	AfDB_Sahanivotry project IRR 20060820	20/08/2006	Investment barrier analysis: financial model (IRR calculation data source)
42.	Ministry of Environment, Water and Forests, National Focal Point for the Climate Change Convention	Letter of Approval of the Small Scale Hydropower Project Sahanivotry in Madagascar (doc. No. 487-09/MEF/SG/DGE/UCPCC)	04/11/2009	Letter of Approval of Madagascar DNA
43.	Sagetec	Etude d'impact Environmental De la Centrale Hydroelectrique de Sahanivotry	12/2001	Environmental Impact assessment
44.	EGBE and Hydelec Madagascar S.A.	Starting construction order including 30% payment	19/03/2007	Timeline: starting date of the project activity.
45.	Le Ministre de L'Energie et de Mines	Décret N° 2001-182 Approbation du contrat de concession de production d'énergie électrique de 10MW à Sahanivotry	05/03/2001	Concession contract approval for 10 MW project
46.	African Development Bank and Hydelec	Loan Agreement	05/07/2007	First loan received by the PO for the project implementation
47.	AfDB/OECD	African Economic Outlook 2005-2006 - Madagascar	2006	Investment barrier analysis: context in terms of financial risks and weakness of the local grid company (JIRAMA)
48.	International Monetary Fund	Republic of Madagascar: Poverty Reduction Strategy Annual Progress Report – Joint Staff Advisory Note.	12/12/2008	Investment barrier analysis: context in terms of financial risks and weakness of the local grid company (JIRAMA)


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Ref. No.	Author/Editor/ Issuer	Title/Type of Document. Publication place	Issuance and/or submission date (dd/mm/yyyy)	Additional Information (Relevance in CDM Context)
49.	Hydelec Madagascar S.A.	Real Generation and Revenues 2008 - 2009	10/2009	Investment barrier analysis: crosscheck with actual electricity production and revenue.
50.	Hydelec Madagascar S.A.	Note d'information sur les kWh fournis (ref.: LH/023/HYD/SAHA)	19/10/2009	Investment barrier analysis: crosscheck with actual electricity production.
51.	World Economic Forum	Global Competitiveness Index 2007 – Competitiveness profiles, Madagascar	2007	Barrier analysis: critical project financing
52.	The World Bank Group	Doing Business 2009 - Madagascar	2009	Barrier analysis: critical project financing
53.	AfDB/OECD	African Economic Outlook 2009 – Madagascar, Macroeconomic Policy	2009	Barrier analysis: critical project financing. Inflation rates and development.
54.	Various newspapers	Midi Madagascar (11/01/2007) Madagascar Tribune L'Express de Madagascar (19/04/07 - 25/07/07 – 28/07/07 – 02/11/07)	Various dates 2007	Stakeholder consultation: public information regarding project implementation.
55.	Antsirabe Municipality	Public communication related to no risks for health and agriculture	25/04/2007	Stakeholder consultation
56.	Pöyry Energy GmbH	Project Design Document for CDM project “Sahanivotry Hydro Power Plant, Madagascar “, version 02	26/10/2009	Revised PDD sent to TÜV SÜD's CB quality control
57.	Pöyry Energy GmbH	Project Design Document for CDM project “Small Scale Hydropower project Sahanivotry in Madagascar “, version 03	27/01/2010	Final PDD



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Ref. No.	Author/Editor/ Issuer	Title/Type of Document. Publication place	Issuance and/or submission date (dd/mm/yyyy)	Additional Information (Relevance in CDM Context)
58.	Hydelec Madagascar S.A.	Hydraulic Data Sahanivotry		Excel Hydrological data
59.	Hydelec Madagascar S.A.	Facture N°HM01/SAHA/0810/JIR - Power invoice period 01/10/08 to 31/10/08	05/11/2008	Investment analysis: crosscheck electricity tariff and power generation
60.	Hydelec Madagascar S.A.	Facture N°HM02/SAHA/0811/JIR - Power invoice period 01/11/08 to 30/11/08	01/12/2008	Investment analysis: crosscheck electricity tariff and power generation
61.	Hydelec Madagascar S.A.	Facture N°HM03/SAHA/0812/JIR - Power invoice period 01/12/08 to 31/12/08	05/01/2009	Investment analysis: crosscheck electricity tariff and power generation
62.	Hydelec Madagascar S.A.	Facture N°HM04/SAHA/0901/JIR - Power invoice period 01/01/09 to 31/01/09	02/02/2009	Investment analysis: crosscheck electricity tariff and power generation
63.	Hydelec Madagascar S.A.	Facture N°HM05/SAHA/0902/JIR - Power invoice period 01/02/09 to 28/02/09	02/03/2009	Investment analysis: crosscheck electricity tariff and power generation
64.	Hydelec Madagascar S.A.	Facture N°HM06/SAHA/0903/JIR - Power invoice period 01/03/09 to 31/03/09	01/04/2009	Investment analysis: crosscheck electricity tariff and power generation
65.	Hydelec Madagascar S.A.	Facture N°HM07/SAHA/0904/JIR - Power invoice period 01/04/09 to 30/04/09	04/05/2009	Investment analysis: crosscheck electricity tariff and power generation
66.	Hydelec Madagascar S.A.	Facture N°HM08/SAHA/0905/JIR - Power invoice period 01/05/09 to 31/05/09	02/06/2009	Investment analysis: crosscheck electricity tariff and power generation

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Ref. No.	Author/Editor/ Issuer	Title/Type of Document. Publication place	Issuance and/or submission date (dd/mm/yyyy)	Additional Information (Relevance in CDM Context)
67.	Hydelec Madagascar S.A.	Facture N°HM09/SAHA/0906/JIR - Power invoice period 01/06/09 to 30/06/09	01/07/2009	Investment analysis: crosscheck electricity tariff and power generation
68.	Hydelec Madagascar S.A.	Facture N°HM09/SAHA/0907/JIR - Power invoice period 01/07/09 to 31/07/09	03/08/2009	Investment analysis: crosscheck electricity tariff and power generation
69.	Hydelec Madagascar S.A.	Facture N°HM11/SAHA/0908/JIR - Power invoice period 01/08/09 to 31/08/09	01/09/2009	Investment analysis: crosscheck electricity tariff and power generation
70.	Hydelec Madagascar S.A.	Facture N°HM12/SAHA/0909/JIR - Power invoice period 01/09/09 to 30/09/09	01/10/2009	Investment analysis: crosscheck electricity tariff and power generation
71.	Hydelec Madagascar S.A.	Facture N°HM13/SAHA/0910/JIR - Power invoice period 01/10/09 to 31/10/09	02/11/2009	Investment analysis: crosscheck electricity tariff and power generation
72.	Hydelec Madagascar S.A.	Facture N°HM14/SAHA/0911/JIR - Power invoice period 01/11/09 to 30/11/09	01/12/2009	Investment analysis: crosscheck electricity tariff and power generation
73.	Hydelec Madagascar S.A.	Facture N°HM15/SAHA/0912/JIR - Power invoice period 01/12/09 to 31/12/09	04/01/2010	Investment analysis: crosscheck electricity tariff and power generation
74.	AfDB	e-mail confirming the validity of the input values as included in AfDB financial model (IRL 41) at the time of the investment decision.	08/03/2010	Validity of the input values