Project Title	Methane Emission Utilization for Power Generation from Ethanol wastewater treatment at PT. Indonesia Ethanol, Lampung province, Indonesia
ERM CVS Project Reference	1814.V1
Report Date	08 August 2011
Client Name	PT Biogas Energy Indonesia
Client Address	Duke Street 33 London, United Kingdom

ERM Certification and Verification Services

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Version Control	Date
Version 01	31 January 2011 (Draft Validation Report)
Version 02	12 April 2011 (Final Validation Report)
Version 02.1	08 August 2011 (Final Validation Report after Request for Review)

Project Title:	Methane Emission Utilization for Power Generation from Ethanol wastewater treatment at PT. Indonesia Ethanol, Lampung province, Indonesia			
Project Location	Lampung Province, Sumatra			
Country:	Indonesia			
Project Parties	Republic of Indonesia (Host); United Kingdom (Annex 1)			
Project Participants	PT Indonesia Ethanol Industry; PT Biogas Energy Indonesia; ISCCP Investment Platform Limited			
Methodology used	ACM0014 "Mitigation of greenhouse gas emissions from treatment of industrial wastewater"			
Methodology version number	Version 03.1			
Estimated Annual Average Emission Reductions	69,578 tCO2e			
Crediting Period Dates	15 June 2011 to 14 June 2021 (10 years) (or date of submission)			
GSP PDD Version	Date: 1 April 2010 Version Number: 01 Start date of GSP: 6 April 2010	Final PDD Version	Date: 22 July 2011 Version Number: 06	

Summary:

ERM CVS was commissioned by PT Biogas Energy Indonesia to validate the project: Methane Emission Utilization for Power Generation from Ethanol wastewater treatment at PT. Indonesia Ethanol, Lampung province, Indonesia (hereafter referred to as 'the project' or 'the project activity') on the basis of UNFCCC criteria for the Clean Development Mechanism (CDM), as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM modalities and procedures and the subsequent decisions by the CDM Executive Board, including the Validation and Verification Manual.

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

Based on the work performed, it is ERM CVS's conclusion that the project as described in the Project Design Document Version 06, 22 July 2011 meets all necessary criteria and requirements of the CDM, correctly applies the methodology (ACM0014, Version 03.1) and is expected to result in real, measurable and long term emission reductions. The DNA of the host Party has confirmed that the project assists in meeting sustainable development criteria.

ERM CVS therefore requests that the CDM Executive Board registers the project as a CDM project activity.

Client:	PT. Biogas Energy Indonesia
Client Representative:	Rudy Sembiring

Report approved by:	Signature
Name Melanie Eddis	
Date: 08 August 2011	

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Abbreviations

BEI	PT. Biogas Energy Indonesia
BOT	Build Operate Transfer
BM	Build Margin
CAR	Corrective Action Request
CIGAR	Covered In-Ground Anaerobic Reactor
CDM	Clean Development Mechanism
CDM-VVM	CDM validation and verification manual
CEF	Carbon Emission Factor
CER	Certified Emission Reduction
COD	Chemical Oxygen Demand
CH_4	Methane
CL	Clarification Request
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
COP	Conference of Parties
DNA	Designated National Authority
DOE	Designated Operational Entity
EIF	Environmental Impact assessment Form
ERPA	Emission Reduction Purchase Agreement
GHG	Greenhouse Gas
GSP	Global Stakeholder Period
FAR	Forward Action Request
FSR	Feasibility Study Report
HDPE	High-density polyethylene
IPCC	Intergovernmental Panel on Climate Change
IRR	Internal Rate of Return
LoA	Letter of Approval
MOP	Meeting of Parties
MP	Monitoring Plan
NPV	Net Present Value
ODA	Official Development Assistance
OM	Operating Margin
PDD	Project Design Document
UNFCCC	United Nations Framework Convention on Climate Change
VVM	CDM Validation and Verification Manual

1. Introduction

1.1. Validation Objective

The purpose of a validation is to provide a thorough independent third party assessment of proposed CDM project activities to ensure that the proposed CDM project activity meets all the identified and applicable criteria for registration of projects under the Clean Development Mechanism. In particular, the project's baseline, additionality demonstration, applicability to an approved CDM methodology, monitoring plan (MP), and the project's compliance with relevant UNFCCC and host country criteria are validated in order to confirm that the project design as documented is sound and reasonable and meets the stated requirements and identified criteria. Validation is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of Certified Emission Reductions (CERs). UNFCCC criteria refer to the Kyoto Protocol criteria and the CDM rules and modalities and related decisions by the COP/MOP and the CDM Executive Board. The validation will result in a conclusion as to whether the project should be submitted to registration. The final decision on whether to register the project rests with Executive Board and the Parties involved.

1.2. Scope

The validation scope is defined as an independent and objective review of the Project Design Document (PDD) and associated documentation. The PDD and associated documentation is reviewed against the criteria and requirements stated in the CDM Validation and Verification Manual (VVM) (EB 44, updated at EB 55) and Article 12 of the Kyoto Protocol, the CDM modalities and procedures as agreed in the Marrakech Accords, as well as relevant decisions by the CDM Executive Board. The validation scope also included an assessment of completeness and accuracy of documentation, evaluation of evidences, information and assumptions made in the PDD and supporting documentation.

1.3. CDM Project Description

PT. Indonesia Ethanol Industry (IEI) plans to produce 40,000 t per year cassava based ethanol, utilizing "fibre" technology, at its new plant (Greenfield project) located at Bandar Mataram District, Lampung Province, Indonesia. The cassava will be sourced from farmers in the nearby region. It is estimated that the plant will discharge about 1,500 m^3 of wastewater per day with an estimated average 85,000 mg/l COD (Chemical Oxygen Demand). PT. Biogas Energy Indonesia (BEI), in association with the IEI, plans to treat the wastewater and capture the methane generated during the process which will be utilized to generate electricity and heat to be utilised in the ethanol plant processes. BEI is a local subsidiary of International & Sindicatum Climate Change Partnership (ISCCP). ISCCP funds BEI in the form of prepayments against future delivery of CERs under an Emission Reduction Purchase Agreement (ERPA) to develop this project activity.

The baseline scenario for the project activity is the treatment of the wastewater in open anaerobic lagoons. The methane generated in the wastewater lagoons as a result of anaerobic degradation of biogenic material escapes into the atmosphere. Coal would be used to fire the boilers in the ethanol factory for the generation of heat and electricity to meet the needs of the ethanol factory. No electricity from the grid would be used for meeting the on-site energy (heat and electricity) requirement of the ethanol factory or the wastewater system. This baseline is in accordance with the baseline scenario specified in the methodology ACM00014 Version 03.1 and also follows the most common and cost-effective approach for ethanol wastewater treatment in the host country.

The project is being implemented at a Greenfield site and at the time of the site visit the ethanol factory and associated wastewater treatment system were not yet constructed. Prior to setting up the ethanol facility, 75% of the land (where the plant is located) was unused and the remaining 25% land was used for cassava cultivation and dwelled by the local people. The construction work on the project is completed but commissioning is pending completion of the ethanol plant which is expected to be finished by July 2011.

The project activity proposes to install an in-ground anaerobic digester technology, CIGAR (Covered In-Ground Anaerobic Reactor), to capture (methane) biogas from the ethanol plant wastewater discharge. The technology consists of a uniquely designed lagoon process with mixers, baffles and a thick high density polyethylene (HDPE) cover, followed by a subsequent aerobic lagoon. The project activity will also consist of utilizing the biogas via co-firing in a 1.8 MW co-generation facility, which would otherwise be fired by coal only, hence, displacing a portion of coal use for the ethanol plant processes. The electricity and heat generated by the coal and biogas will be utilized for meeting the entire on-site energy (electricity and heat) requirements of the ethanol facility. No electricity will be sourced from grid for the plant operations. In the event of boiler failure or maintenance, biogas will be flared in the flaring system established as part of the project implementation.

The project activity will lead to a reduction of greenhouse gas (GHG) emissions through:

1. **Avoidance of methane emissions:** The methane produced during the anaerobic process in the in-ground digester will be captured and utilized to generate electricity and heat. In the absence of project activity the methane emissions from the open lagoons would have been emitted in the atmosphere;
2. **Avoidance of CO_2 emissions:** The project activity will utilize the biogas for electricity and heat generation for utilising in the ethanol plant and thereby reduce utilization of coal and its associated emissions.

It is estimated that the proposed project activity will reduce approximately an average of 69,578 tCO2e of GHG annually over the period of 10 years (estimated lifetime of the project). The ethanol plant project developers plan to ramp up the ethanol plant over the first three years from 30% in first year, 50% in 2nd year 75% in 3rd year and 100% from 4th year onwards.

All project components were covered during the validation process. ERM CVS confirms that the project description provided in the final PDD is accurate and complete and complies with the CDM requirements. A site visit was conducted to validate the current situation and the baseline scenario was validated as per the requirements of the Methodology.

1.4. Validation Personnel

Validation Team	Role	Coverage of sectoral scope	Coverage of technical area	Financial Expertise	Host country experience	Participated in site visit?
Jan Smolders	Lead Validator	√	√			√
Angus McEwin	Validator; Financial Expert			√	√	√
Hamilton Ida	Validator	√	√			
Maharini Arismawati	Local support, Language expert				√	√
Ina Balik	Validator (after Request for Review)	√	√		√	

Technical Review	Role	Coverage of sectoral scope	Coverage of technical area	Host country experience	Participated in site visit?
Bilal Anwar	Technical Reviewer	√	√	√	No

Jan Smolders has more than 25 years experience as occupational heath and exposure researcher, environmental laboratory researcher and manager, environmental consultant and auditor. His experience includes:

- Performed and contributed to CDM verifications and validations as lead or team member in China, Thailand, Indonesia and South-Korea regarding hydropower and wind power generation, methane recovery from waste water treatment plants and N2O emission abatement. He has lead four methane recovery from waste water treatment plant validations.
- He is ERM CVS Technical Reviewer for N_2O abatement projects.
- Auditing work among others comprised auditing QA/QC systems of laboratories and air emission inspection institute, environmental performance of industrial sites as well as environmental and technical inspection of facilities such as waste water treatment plants, landfill gas extraction facilities and air treatment installations. He also prepared and implemented environmental monitoring plans for landfill and groundwater remediation sites.
- For more than a decade he worked and did research in environmental and toxicological laboratories including analysis of contaminants in soil, water and air and developed and implemented QA/QC systems including instrument calibration and statistical analysis of QA/QC data.
- In several long term projects he was team member of EU financed projects with the aim to assist former East-European countries to develop and implement EU environmental regulations in these countries. Another long term project had the aim to assist the Romanian accreditation body (ASRO) to build capacity to implement EU regulations and standards in Romania.

Angus McEwin has more than ten years experience working in environmental and economic analysis in the UK, Australia, Vietnam and Indonesia. Over the last seven years Angus has worked as an environmental and socio-economist within the natural resources and environment sector in South East Asia.

His experience includes:

- Contributed to CDM and validations as lead or team member in Vietnam, Thailand, Indonesia and the Philippines for hydropower, wind power, and methane recovery from waste water treatment plants projects. He has contributed to/ is contributing to three methane recovery from waste water treatment plant validations.
- Acted as Financial Expert projects across a range of regions and sectors, including China and India, coal-mine methane, waste-heat recovery, renewable energy generation and waste to energy projects.
- Auditing work among including auditing environmental performance of industrial sites as well as environmental and technical inspection of facilities and environmental due diligence audits.
- Undertaking Environmental and Social Impact Assessments for a range of large-scale projects in Vietnam and Indonesia.
- Assessment of biomass residues in Vietnam and Indonesia.
- Assessment of the carbon revenue potential of mangroves in Vietnam.
- Assistance with a proposed REDD project in Sumatra.
- Assessment of economic impacts of regulations and capital investment projects for a management consultancy in Sydney.

- Over four years as a financial analyst in the banking sector in London.

Hamilton Ida has extensive experience in managing and developing CDM projects since 2005, in Sectoral Scopes 1, 13 and 15, with emphasis in methane capture and combustion projects with animal manure, wastewater and landfills, and renewable energy projects (biomass, hydro and biogas). In ERM CVS since 2010, he has mainly played the role of CDM Technical Reviewer, taking part of Validation and Verification teams on specific projects. Additionally, since 2008, Hamilton Ida is an independent instructor for the Capacity Building Program in Carbon Markets developed by the Brazilian National Industry Confederation (CNI), lecturing about CDM projects related to the energy and waste sectors.

Maharini Arismawati is an Indonesian national, fluent in Bahasa Indonesian and familiar with the project area as well as national regulations and policies. Ms Maharini is an environmental consultant with Environmental Resources Management She holds a bachelor degree in Chemical Engineering from one of the most reputable universities in Indonesia, Institut Teknologi Bandung. Maharini specializes in risk studies for the oil & gas industry. Her experience includes:

- Hazard and Operability (HAZOP), Hazard Identification (HAZID), Layer of Protection Analysis (LOPA), Quantitative Risk Analysis (QRA), Consequence Modelling, and other related risk studies.
- She has worked for a large number of clients in the oil and gas sector and for engineering and construction companies.

Bilal Anwar has ten years of professional experience in the area of International Climate Change Policy, Regulatory aspects of the Global Climate Regime, setting-up of the global accreditation system under the CDM and technical and methodological aspects relating to projects for reducing GHG emissions. This experience has been gained in the Secretariat for United Nations Framework Convention on Climate Change (UNFCCC) by supporting the CDM regulatory regime. In this role Bilal developed a profound understanding of all aspects of the project based mechanisms (CDM& JI) namely: regulatory, methodological, technical, legal and procedural. Bilal had been closely involved in the development of methodological and technical frameworks, including baseline and monitoring methodologies, standards for CDM projects, regulatory and technical requirements and associated procedural frameworks.

Ina Balik is a Civil Engineer/Environmental Engineer with over 8 years experience in environmental engineering, specifically in the waste sector. Before joining ERM CVS she gained 5 years experience in the carbon markets, having previously worked in a large carbon trading organisation. Her work included overall GHG project management, including due diligence on carbon projects (CDM/JI), CDM Project Design Document (PDD) development, quality assurance and technical review of CDM project documentation, the development of GHG monitoring plans and project related risk assessments, and management of CDM projects through the validation, registration, verification and issuance stages on numerous complex projects. In South East Asia, she focussed on supporting the Indonesian portfolio and local team for more than two years, providing technical assistance on biomass, anaerobic digestion, composting, and renewable energy projects specifically. Additionally she has worked as a technical expert in Latin and South America, and Africa on landfill gas, anaerobic digestion, and composting project. Her CDM validation and verification experience entails development and quality control of carbon projects in numerous sectors including landfill gas, coal mine methane, biomass-to-energy, anaerobic digestion, composting, waste gas and heat, geothermal energy, hydroelectricity, and fuel switch.

2. Methodology

The validation was carried out in accordance with the CDM-VVM, version 1 published at EB 44 and updated at EB 55. The validation process employed standard auditing techniques and undertook necessary cross-checks and follow-up actions to ascertain the correctness of the information. The validation team included staff with experience in the relevant sectoral scopes and technical areas within the sectoral scope, and included local host country expertise, sectoral knowledge, and financial expertise. The validation report and associated documents have undergone a thorough technical review by ERM CVS before being submitted to the CDM Executive Board for registration. The validation consisted of the following key phases:

I. Upload of the PDD for Global Stakeholder Process (GSP), receipt of any comments from stakeholders (GSP started on 6 April 2010);

II. Desk review of documentation including PDD, methodology and key supporting documents and references;

III. A visit to the project site, including interviews with personnel responsible for developing the project (the site visit took place on 8-9 April 2010);

IV. Development of a draft validation report, identifying non-compliances including Corrective Action Requests (CARs) and Clarification Requests (CLs), taking into account findings of the GSP, desk review and site visit / interviews;

V. Resolution of outstanding issues (CARs and CLs) and development of a final validation report and validation opinion.

2.1. Global Stakeholder Process consultation

The PDD version 01, dated 1 April 2010, was uploaded for global stakeholder comments. The Global Stakeholder Process was from 6 April to 05 May 2010. Relevant information can be found at:

http://cdm.unfccc.int/Projects/Validation/DB/2882F54NZMUCIUVYR1XI6QN9SEEPG6/view.html

No comments were received.

2.2. Desk Review

The validation is based on the review of documentation and interviews with various personnel. A detailed desk review of the PDD, methodology and all other associated documentation and references took place in advance of the site visit, and additional documents that were not available for the desk review were requested for review during the site visit.

A list of documents reviewed is included in Appendix A.

2.3. Site visit and interviews

Interviews took place on site, via telephone or via email and include relevant stakeholders in the host country, personnel responsible for project design and implementation, and other stakeholders as applicable.

The site visit took place on 8 - 9 April 2010. ERM CVS staff attending the site visit included Jan Smolders (lead validator), Angus McEwin (validator and financial expert) and Maharini Arismawati (local and language expert). The site visit included a tour of the physical project site, including the proposed site of the ethanol factory and the wastewater treatment system. Local cassava farmer households were also visited.

Staffs from the Project Participants (PT Indonesia Ethanol Industry, PT Biogas Energy Indonesia, ISCCP Investment Platform Limited), waste water treatment specialist and local stakeholders were interviewed. Document review took place at the project office at the site and in PT Indonesia Ethanol Industry main office in Jakarta.

A list of interviewees, and the main topics discussed with each can be found in appendix A.

2.4. Reporting

A validation protocol checklist of the key requirements for validation is included as Appendix B. The validation protocol serves the following purposes:

- It organises, details and clarifies the requirements a CDM project is expected to meet.
- It ensures a transparent validation process where the validator will document how a particular requirement has been validated and the result of the validation.
- It must also list project components/issues not covered in the validation engagement

The protocol describes the following:

CDM Validation Protocol Checklist

Checklist Question	Reference	Comment	Draft Conclusion	Final Conclusion
The requirements that the project should meet	The documents used to check the answer to the checklist question	This section is used to elaborate and discuss the conformance to the checklist question, and to explain the conclusion reached. It includes the means of validation, which explains how conformance with the checklist is justified. For example document review (DR) or interview (I). N/A means not applicable	This is either acceptable based on evidence provided (OK), or a *Corrective Action Request* (CAR) is required due to non-compliance with the checklist question. A request for *Clarification* (CL) is used when the validation team has identified a need for further clarification. A 'Minor Issue' may be recorded for typographical errors or similar minor errors that do not have an impact on the compliance of the project to the CDM rules but nevertheless should be corrected to improve clarity. A *Forward Action Request* (FAR) could be raised for issues to be addressed during first verification that do not form part of the registration requirements	Indicates whether the CAR or CL has been closed out (OK).

Remediation Form:

Clarification Requests (CL), Corrective Action Requests (CAR) and Forward Action Requests (FAR), plus minor issues are raised in the draft validation protocol and detailed in a separate form using Table 3 (Appendix C). In this form, note is made of actions taken by the Project Proponent to close outstanding CARs and respond to CLs and Forward Action Requests:

Draft report corrective action, clarification, or forward action requests, or minor issues	Reference to CDM Validation Protocol Checklist	Summary of Project Participants' response	Final conclusion
List of CARs, CLs and FARs (and minor issues)	Reference to the validation protocol checklist question	Summary of response during the communication with the validation team	Summary of validation team responses and final conclusion.

Clarification Requests (CL): Where insufficient or unclear information is available and clarification or new information is required. A CL is raised specifying what additional information is required.

Corrective Action Requests (CAR): Where a non-conformance arises the Assessor shall raise a Corrective Action Request (CAR). A CAR is issued, where:

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

The validation process may be halted until this information has been made available to the assessors' satisfaction. Failure to address a CL may result in a CAR. Information or clarifications provided as a result of a CL may also lead to a CAR.

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

A 'Minor Issue' may be recorded for typographical errors or similar minor errors that do not have an impact on the compliance of the project to the CDM rules but nevertheless should be corrected to improve clarity.

2.5. Internal Quality Control

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

3. Validation conclusions

3.1. Main changes between the PDD version published for the global stakeholder comment period and the final version submitted for registration

- Change in start date from 26 November 2008 (signing of steam turbine work order)[DR 17] to 12 February 2010 (signing of BOT contract between PT Indonesia Ethanol Industry and PT. Biogas Energy Indonesia) [DR 63];
- Correction in estimated annual average emission reductions over the crediting period from 70,979 to 69,578 tCO2e annual average over 10 years;
- Figure 2 in A.4.3. the baseline situation was revised;
- Figure 3 in A.4.3. the project activity situation was revised;
- Table 1: specs of power generation unit was changed;
- Table 2: specs of flare was changed;
- Table 3 in A.4.4, emission reductions were revised;
- Table 5 in b.2 the applicability conditions was changed;
- Figure 4 in B.2 project boundary diagram was revised;
- Table 6 in B.3 sources and gases was revised;
- Inclusion of additional alternative baseline lagoon potential designs in Section B.4;
- Inclusion of alternatives E4 and H4 in Section B.4 of the PDD;
- Table 8 in B4 was revised to include added alternatives for baseline design;
- Table 9 in B4 was revised to include added options in financial assessment;
- The Step 3 in b4: “Eliminate alternatives that face prohibitive barriers” was revised;
- Step 4 in b4: “Compare economic attractiveness of remaining alternatives” was revised;
- Table 10 in B4: “Assumptions for baseline scenario C1” was revised;
- Table 11 in B4 was removed;
- Table 12 in B4: “Assumptions for baseline scenario” was revised;
- Table 13 in B4: “Summary for NPD results” was revised;
- Table 14 in B4: “Sensitivity analysis results” was revised;
- Additional information in Section B.4 regarding the comparison of alternatives and remaining alternatives;
- Additional information in Section B.5 with regards to the project activity timeline;
- In B5, the time line table was revised;
- Table 15, result of investment analysis comparison was revised;
- Step 4: Common Practice analysis was completely revised;
- Revisions to land cost, exchange rate and other minor revisions to the input assumptions used in the investment analysis;
- Increase in estimated capital expenditure required for the project based on inclusion of implementation costs;
- Removal of Step 3 from Section B.5 (barrier analysis);
- In B.6 emission reduction calculations, revisions were made regarding among others the Grid emission factor calculation, the formulae and method used for flaring and the sludge emissions;
- In B.6.2 “Data and parameters that are available at validation” revisions were made;
- In B.6.3 Table 14, 16-18 and 20-32: Ex-ante calculation for the proposed project activity” revisions were made;
- In B.6.3 project emissions from flaring and related tables were revised;
- B.6.4 Table 34: Ex-ante estimation of emission reduction” was revised;
- Revisions were made in table B.7.1: “Data and parameters monitored”;
- The schematic monitoring system as shown in Figure 5 in B.7.2 was revised;
- C.1.1.: “Starting date of the project activity” was revised;
- E2:”Summary of the comments received” was revised;
- Annex 5: “Baseline Scenario Cost Breakup” was added;
- Financial analysis of baseline options updated in section B.4
- The grid emission factor calculations were embedded from the spreadsheet into the PDD;
- The calculation of the emission factor of the electricity generated by the baseline captive co-generation plant were updated in accordance to equation (17) of ACM0014;
- The parameter $\eta_{EL,captive}$ was added to section B.6.2 of the PDD;

3.2. Approval and Participation Requirements

The Project Participants are PT. Indonesia Ethanol Industry, PT. Biogas Energy Indonesia, authorised by Indonesia, and ISCCP Investment Platform Limited authorised by the United Kingdom. The host Party, Indonesia, and Annex I Party, United Kingdom, have both ratified the Kyoto Protocol. Both Parties have established their respective Designated National Authorities (DNA) as per the participating requirements for CDM under the Kyoto Protocol.

Sindicatum Carbon Capital is the PDD consultant linked to the ISCCP Investment Platform Limited.

The host Party letter of approval (LoA) was issued by the Indonesian National Committee on CDM on 18 August 2010 [DR 30]. ERM CVS was able to confirm the authenticity of the host country DNA LoA. [DR 52]

The received LOA from the Project Participant confirms that:

- The host country has ratified the Kyoto Protocol on 28 July 2004;
- PT. Indonesia Ethanol Industry and PT. Biogas Energy Indonesia is authorised as a Project Participant by the Republic of Indonesia to voluntarily participate in the project activity;
- The project will contribute to the sustainable development of Republic of Indonesia;

An Annex I country LoA has been provided from the Government of United Kingdom dated 29 October 2010 [DR 31]. The project title and Project Participant name are consistent with the PDD. The LoA was received from the PDD consultant. Its authenticity was checked against a list of approved CDM projects on the website of the UK DNA [DR 53].

The LoA from UK has been checked and it clearly refers to the:

- Ratification of the Kyoto Protocol;
- Voluntary Participation;
- Reference to host country approval;
- Reference to the precise project title in the PDD.

The LoA does not contain any specifications or conditions of the project activity, and it does not make reference to a specific version of the validation report or PDD.

The validation did not reveal any information that indicates that the project can be seen as a diversion of official development assistance (ODA) funding towards Republic of Indonesia.

3.3. Project Design

Conformance of the PDD with EB guidelines

The PDD has been checked against the latest 'Guidelines for developing the Project Design Document' (version 7) and the latest template for the Project Design Document (version 3) available on the CDM website. It is confirmed that the final PDD is in compliance with the template and guidelines.

Conformance of the project design in the PDD with source documents such as the FSR

The project description has been validated against key pages of the FSR for the ethanol plant (pages 2, 8,11,12 and 21) [DR 24], ethanol plant layout [DR 15] and the approved Environmental Impact Assessment (EIA) report (dated May 2009) [DR 11] and Build Operate Transfer (BOT) agreement between PT Indonesia Ethanol Industry and PT Biogas Energy Indonesia (dated 12 February 2010) [DR 63].

The technical details of the project were further cross-checked against other available project implementation supporting documentation, including, engineering service contract [DR 54], wastewater treatment plant layout [DR 55], digester construction cost and gas burner cost quotation [DR 19].

Following the verification of project technical details, ERM CVS confirms that project design is consistent and in accordance with source and supporting documentation.

Timeline and operational status of the project

At the time of site visit, the ethanol factory (source of the wastewater) was under construction, with the structural elements of the buildings being erected. Construction of the wastewater treatment system of the project activity started on 21 May 2010 with the award of the contract for the earth works for the bio-digester [DR 56]. This has been validated against the contract for engineering services with Waste Solutions [DR 54] and subsequent variation orders received since May 2010 [DR 57]. Further evidence was sought with respect to the current status of the project implementation, which, included cost quotations for various

engineering installations [DR 58] and evidence of advance payments for engineering work and key equipment purchase contracts [DR 59 and DR 60].

Based on the site visit observations and also from the verification of other evidences, no factors were identified that could result into unmanageable adverse delays on the construction of the project. Project commissioning is expected to be in July 2011 after the completion of construction and engineering work on ethanol plant.

The start date of the project activity is 12 February 2010, which is the date when the BOT contract between PT. Indonesia Ethanol and PT. Biogas Energy Indonesia was signed [DR 63]. The signing of the BOT contract represents the earliest date of start of real and committed action by Project Participants on the project activity. The start date is assessed in more detail in section 3.5 below, and in the validation protocol checklist (Appendix B).

The expected operational lifetime of the project activity is 10 years, and the construction period is indicated to be approximately 1 year. The project lifetime has been clearly stated in section C.1.2 of the PDD, and is consistent with the investment analysis [DR 2]. The validity of the project lifetime has been confirmed through following:

- Third party quotation for the biodigester system (CIGAR) [DR 19] and the gas capture membrane purchase contract [DR 60]. Both key project equipments have a warranty and lifetime of 10 years. To limit the lifetime of the project to the lifetime of the CIGAR and the membrane is considered conservative and justified;
- The term of the BOT contract between PT. Indonesia Ethanol and PT. Biogas Energy Indonesia is ten years which also enforces the ten years lifetime of the project. Under the conditions laid out in the BOT contract the ownership of the project will be transferred which represents a significant change in the project situation, hence, term of the BOT contract is a justified parameter for the lifetime of the project;
- The lifetime of the baseline scenario is based on the lifetime of wastewater lagoons which would be longer than 10 years so assuming only 10 years for the project activity is considered conservative.

Based on above evidences and also on ERM CVS local and sectoral knowledge, 10 years lifetime is considered reasonable for a waste energy power generation facility in Indonesia.

Permits and approvals:

ERM CVS has confirmed that the project activity has the relevant permits and approvals needed to develop a power generation project in the host country. ERM CVS has checked relevant permits and approvals including:

- Notary Public of Indonesia Ethanol Industry (CONFIDENTIAL, company license of PT Biogas Energy Indonesia) [DR 12]
- Deed of Incorporation_ PT.Biogas Energy Indonesia (CONFIDENTIAL, permission to do wastewater, biogas related projects) [DR 13]
- Ethanol Factory EIA report [DR 11];
- Ethanol Factory EIA approval [DR 14];
- Documentation confirming the land use rights [DR 29].

All the necessary permits and approvals were found to be in place in accordance with host country requirements and applicable national laws and regulations. Furthermore, the project description was found to be consistent between the final PDD and the approvals.

Project location

The project activity is located on the premises of Indonesia Ethanol's factory, located in the village of Sriwijaya Mataram, Bandar Mataram district, Lampung Tengah of Lampung Province in Sumatra, Indonesia. The cassava for the ethanol factory will be sourced from nearby farms.

The location described in the final PDD accurately reflects the location of the project activity and has been validated during the site visit, and is consistent with the location of the project activity in other documents including the EIA report [DR 11].

3.4. Baseline

Applicability of selected methodology

The project activity applies approved baseline and monitoring methodology ACM0014 "Mitigation of greenhouse gas emissions from treatment of industrial wastewater", Version 3.1. This was the most recent version of the methodology valid at the time of validation start. The methodology also refers to the "Tool for the demonstration and assessment of additionality" (Version 05.2) and the "Tool to determine project emissions from flaring gases containing methane" (Version 01). These were the most recent versions of these tools valid at the time of validation start. The chosen methodology is considered appropriate for the project activity and is found to be correctly applied based on the aspects as shown in Table 1. Table 1 has been validated by the ERM CVS validation team.

The applied methodology includes two scenarios for the baseline and the implementation of project activities and the project activity belongs to scenario1 of the methodology: which describes the baseline to that the wastewater is not treated, but directed

to open lagoons that have clearly anaerobic conditions. And in the project scenario the wastewater is treated in a new anaerobic digester and the biogas extracted from the anaerobic digester is flared and/or used to generate electricity and/or heat.

Table 1: Validation of the applicability criteria of the methodology

Description of the baseline situation	*Description of the project activity*
The average depth of the open lagoons or sludge pits in the baseline scenario is at least 1m.	In the absence of the project activity, as described in the baseline scenario, the wastewater would be treated in a series of open lagoons (2 anaerobic lagoons and 1 facultative lagoon) before the wastewater would be discharged to the water body. All lagoons would have a depth of over 2 m, hence, complies with the methodology applicability conditions. Further details are provided in the baseline section of the report.
Heat and electricity requirements per unit input of the water treatment facility remain largely unchanged in the baseline scenario and the project activity.	There is no heat requirement in the baseline scenario and project activity for wastewater treatment. The amount of electricity required per unit input of water in the project activity and in the baseline scenario is 1.41 kWh/m³ of wastewater and 0.163 kWh/m³ of wastewater respectively. Hence it can be seen that the electricity requirement remains largely unchanged in the project activity and in the baseline scenario and is insignificant compared to the expected renewable electricity from the project activity which is approximately 0.5MW (Total electricity generation/Operational Hours 3781/7200 = 0.52) Also as per ACM0014 version 3.1 'If electricity is generated with biogas under the project activity, the electricity consumption for the operation of the project activity should be subtracted from the total on-site electricity generation with biogas in calculating *EGPJ,y* (i.e. *EGPJ,y* only includes the *net* electricity generation resulting from the project activity)'. Therefore electricity requirements of the wastewater treatment plant will be sufficiently fulfilled by the electricity generated by the project itself.
Data requirements as laid out in the methodology are fulfilled.	The data requirements as laid out in the methodology are fulfilled.
The residence time of the organic matter in the open lagoon system should be at least 30 days.	In the most plausible baseline design option of anaerobic open lagoon system the retention time of the organic matter is 36 days, hence it fulfils the requirement of at least 30 days.
Local regulations do not prevent discharge of wastewater in open lagoons.	Indonesian regulations do not prevent discharge of wastewater in anaerobic open lagoons. Based on ERM CVS local and sectoral knowledge, it can be confirmed that discharge of wastewater in open lagoons is a common practice and widely adopted in the region.
The methodology is only applicable if it can be demonstrated that the baseline scenario for Scenario 1 is W1 for the treatment of wastewater and, if applicable, E1/E2 for the generation of electricity.	The baseline scenario for wastewater treatment is W1 - Use of open lagoons for the treatment of the wastewater and that for electricity is E1- Power generation using fossil fuels (coal) in a captive power plant.

The conformity of the project activity to the methodology ACM0014 version 3.1 was cross checked against the design of the project contained in the project design and supporting documentation. The pre-project situation is a Greenfield site and was confirmed during the site visit and cross-checked through associated documentation [DR 11, 15, 24, 54, 55, 63]. Likely baseline wastewater treatment scenario in the absence of the project activity was validated against the baseline study undertaken by the Project Participant (DR 23) and further validated by the opinion of a third-party wastewater expert and Indonesian expert (Prof. Tjandra Setiadi, PhD) (DR 72, DR 73), contracted by ERM CVS. Local and sectoral knowledge of the validation team allowed them to confirm the baseline situation which is most common practice in the host country and also the design of the project activity.

ERM CVS confirms that the project design complies with the applicability conditions of the baseline methodology ACM0014 version 3.1. Additional details of the validation process are provided in the validation protocol checklist (Appendix B).

Project boundary

The project boundary has been correctly defined according to methodology ACM0014 Version 03.1, to include:

- The site where the wastewater is treated in both the baseline and the project scenario.
- The sites where any sludge is applied to lands.
- On-site cogeneration plant that supplies electricity to the wastewater treatment system.
- The anaerobic digester, the power and heat generation equipment and the flare installed under the project activity.

No emissions other than those allowed by the methodology are expected to result from the project, and no GHG emissions occur within the proposed CDM project activity boundary, as a result of the implementation of the proposed CDM project activity, which are expected to contribute more than 1% of the overall expected average annual emissions reductions, which are not addressed by the applied methodology.

Details of emission sources and gases included in the project boundary are illustrated below in the table:

Table 2: Emission sources and gases included in the project boundary

Emission Type	GHGs involved	Source
Baseline emissions	CH4	The major source of emissions from open wastewater lagoons
	CO_2	(i) Electricity generated from the captive cogeneration plant utilizing coal only (ii) Thermal energy generated from the captive cogeneration plant utilizing coal only.
Project emissions	CH4	The treatment of wastewater under the project activity will cause different emissions. (i) Methane emissions from the lagoons. (ii) Physical leakage of methane from the digester system. (iii) Methane emissions from flaring (if biogas from the digester is flared). (iv) Methane emissions from land application of sludge.
	CO_2	On-site electricity consumption of the digester.
	N_2O	Land application of sludge
Leakage	N/A	No leakage needs to be considered when applying this methodology.

It is confirmed that the project boundary is in accordance with the methodology and all emission sources and gases associated with the implementation and operation of the project activity are correctly accounted for. In accordance with the applied methodology no leakage is needed to be considered in applying this methodology.

Baseline Identification

The project activity is the installation of a new wastewater treatment system attached to a new ethanol factory. The wastewater treatment system will capture and utilise biogas for electricity and heat generation. The baseline scenario for wastewater treatment, in accordance with the methodology, must include determination of realistic and credible alternatives for wastewater treatment and electricity/ heat generation in the absence of the project activity. The PDD followed the four steps for project activities implemented in Greenfield activities, as required by ACM0014. Different alternatives for wastewater treatment scenario included both aerobic and anaerobic options and their scope for application was considered. Following the requirements of the methodology for a Greenfield development, the baseline scenario has been determined by identifying likely feasible baseline wastewater treatment design and assessing which design is the most economically attractive. The baseline study considered possible five anaerobic wastewater treatment options specifying the design parameters as required by the methodology. All five options took into consideration the local conditions as well as design specifications of average depth of anaerobic lagoon, wastewater treatment surface area, anaerobic retention time, discharged COD, electricity consumption and effluent adjustment factor (ADBL).

An independent local wastewater expert (Prof. Tjandra Setiadi, PhD) was commissioned by ERM CVS to review and comment on the reasonableness of assumptions for this baseline study and the resulting selection of the baseline scenario. The financial analysis of different baseline options for wastewater treatment, based on the simple cost analysis, concluded that open lagoons with 6m depth (at net present value of -7,127 for 15 years @ 12.96% discount rate) is the least cost option (option 3) and therefore is selected as the design for baseline option (W1).

Key cost considerations consistent with design specifications of different baseline options and their validation details are presented in the table below:

Table 3: Costs related to Baseline Options

Cost Item	Validation Check	Reference Document
Capital Cost		
Civil Works Machinery and Equipment	Baseline study report provides the details of costs related to civil works and machinery equipments for baseline options. ERM CVS has reviewed the indicated cost elements and associated costs based on its sectoral and regional expertise. This cost information is further validated by an independent wastewater expert, contracted by ERM CVS.	[Doc 23, 74, 89, 90, 96]
O&M Cost		
Maintenance Cost (Electricity Cost)	Maintenance cost is basically electricity consumption cost for treating wastewater. The assumed price of the electricity in the baseline study report has been cross-checked from the publicly available Indonesian government source and is found reasonable.	[Doc 23, 74, 89, 90, 96] http://www.bpk.go.id/web/?page_id=917
Chemical Consumption	Chemical consumption cost is the cost of caustic soda which is required for neutralization process in the wastewater treatment. The assumed price of caustic soda has been cross-checked with the actual cost based on an original invoice from the supplier of the caustic soda.	[Doc 23, 74, 89, 90, 96, 97]
Labour Cost	Labour cost is based on the baseline study. Based on ERM CVS local and sectoral knowledge it is confirmed that the cost of labour is reasonable for the economic and industrial practices of the host country.	[Doc 23, 74, 89, 90, 96]

The selected baseline option is also consistent with the common practice in the industry which also confirms it as the most plausible option in the absence of the project activity. Alternative wastewater system designs with shallower depths and/or utilising aeration were dismissed as they were demonstrated as being more expensive. The result of the PP's literature research was confirmed to be reasonable and reliable by the wastewater expert. Reasons presented for them being more expensive were thoroughly validated and based on ERM CVS local and sectoral knowledge it is confirmed that elimination of alternative scenarios is reasonable.

The least cost lagoon system design (baseline lagoon) and its defined design parameters inter alia depth, hydraulic retention time, $COD_{in,x}$ and $COD_{out,x}$, and effluent adjustment factor (ADBL), which were used as key input values for the emission reduction calculations, are taken from the Baseline Study Report [DR23] and were validated for their appropriateness in the context of host country regulations and established industry practices. The independent local wastewater expert confirmed the appropriate selection of the least cost lagoon system design and the respective input values i.e., $COD_{in,x}$ and $COD_{out,x}$, based on his sectoral knowledge. The PP opted for further conservativeness by chosing the $COD_{in,x}$ value after pre-treatment (68,000 mg/l) and not directly the COD of the ethanol's plant effluent (85,000 mg/l). ERM CVS checked the correct transcription of the values from the Baseline Study report into the emission reduction calculation spreadsheets and the PDD, and confirms that the design COD inflow (68,000 mg/l) for COD_{in} and the design effluent COD flow (1,530 mg/l) for COD_{out} correspond to the design features of the lagoon system that was identified in the Procedure for the identification of the most plausible baseline scenario. The PDD and underlying emission reduction calculations are in line with the methodological requirements for Greenfield projects set out in ACM0014 v3, and the ex ante estimates are stated conservatively.

In accordance with the requirement of the methodology, average depth of the identified baseline design lagoon option was verified through a survey of control group of five most recently established lagoon systems in ethanol industry in Indonesia. The survey as well as focussed literature search confirmed that lagoons should be as deep as possible and a depth approaching 6.00m has been recommended as the most appropriate design option.

The electricity/ heat baseline scenario is consistent with the previous plans of the ethanol factory to use only coal to fire boilers to generate electricity and heat in a co-generation system. A number of other alternatives were identified, thoroughly considered but dismissed as not feasible: Summary of these options and basis of their dismissal is as follows:

- Generation of heat and electricity separately is well-known to be more expensive and less practical than co-generation in the given scenario;
- The use of grid supply of electricity is also not feasible due to the lack of reliable grid supply at the site [DR 20];
- The use of other fuels including renewable sources was also not found feasible due to lack of their regular supply and/or lack of potential for renewable sources of energy in the region as well as technical difficulties [DR 21, 22].

Remaining combinations of baseline alternatives for wastewater treatment and heat and power generation were identified and eliminated based on their economic attractiveness. Further details of economic attractiveness of these alternatives have been provided in the additionality section of the report below.

For the determination of the baseline emission factor please refer to Section 3.7 of this report.

ERM CVS has confirmed that the procedure contained in the methodology to identify the most reasonable baseline scenario has been correctly applied. Each step of the procedure described in the PDD was checked against the requirements of the methodology.

3.5. Monitoring Plan

The project activity applies approved monitoring methodology ACM0014 Version 03.1. The monitoring plan has been applied correctly and transparently, is in accordance with the approved methodology, and provides for accurate measurement of the emission reductions ex-post. Monitoring parameters selected for this project are chosen in accordance with the selected option for utilization of the biogas: co-firing in a 1.8 MW co-generation facility, which would otherwise be fired by coal only. The electricity and heat generated by the coal and biogas will be utilized for meeting the on-site energy (electricity and heat) requirement of the ethanol facility. No electricity will be sourced from grid for the plant operation. In case of boiler failure or maintenance, biogas will be flared in the flaring system established as part of the project implementation. Based on this application, the monitored parameters are presented in below tables. These parameters are clearly described in the PDD and the means of monitoring in the PDD complies with the requirements of the methodology ACM0014 Version 03.1.

Data / Parameter:	$F_{PJ,dig,m}$
Data unit:	m³ / month
Description:	Quantity of wastewater that is treated in the anaerobic digester in the project activity in month m
Measurement procedures	Flow rates will be continuously monitored online (PLC) with Flow Meters (electromagnetic flow sensor) having an accuracy of +/- 2%
Monitoring frequency	Parameter monitored continuously and aggregated annually for calculations
QA/QC procedures to be applied:	Flow meters undergo maintenance/calibration in line with manufacturer's recommendations.

Data / Parameter:	$w_{COD,dig,m}$
Data unit:	t COD / m³
Description:	Average chemical oxygen demand in the wastewater that is treated in the anaerobic digester in the project activity in month m
Measurement procedures	A representative sample of waste water will be analysed for COD according to appropriate national or international standards by external laboratory. The appropriateness of the applied standards and the qualification criteria for the laboratories (e.g. accreditation) will be determined before starting monitoring activities and will be kept consistent over the whole crediting period.
Monitoring frequency	Weekly. Calculate average monthly and annual values
QA/QC procedures to be applied:	Measure COD parameter according to national or international standards.

Data / Parameter:	$T_{2,m}$
Data unit:	K
Description:	Average temperature at the project site in month m
Measurement procedures	The data will be based on information provided by Department of Climatology.
Monitoring frequency	Continuously, aggregated in monthly average values
QA/QC procedures to be applied:	-

Data / Parameter:	$FC_{Coal,y}$

Data unit:	tonnes / year
Description:	Quantity of coal utilized for electricity generation in year y
Measurement procedures	The coal consumption will be measured using a load cell
Monitoring frequency	Measured continuously
QA/QC procedures to be applied:	The load cell will undergo maintenance/calibration in line with manufacturer's recommendations. The measured quantity will be cross-checked with changes in the stock.

Data / Parameter:	$NCV_{Coal,y}$
Data unit:	kJ/ kg
Description:	Weighted average net calorific value of coal in year y
Measurement procedures	Measurements will be undertaken in line with appropriate national or international standards by external laboratory. The appropriateness of the applied standards and the qualification criteria for the laboratories (e.g. accreditation) will be determined before starting monitoring activities and will be kept consistent over the whole crediting period.
Monitoring frequency	Every shipment
QA/QC procedures to be applied:	The NCV of coal sample will be cross checked with external laboratory. Measure NCV parameter according to national or international standards.

Data / Parameter:	EG_y
Data unit:	MWh / year
Description:	Total electricity generated in year y from steam turbine (from coal and biogas)
Measurement procedures	Measured continuously with 0.5 class electricity meter by PLC (online).
Monitoring frequency	Continuously. Aggregated monthly.
QA/QC procedures to be applied:	The electricity meter will be calibrated as per manufacturer specification.

Data / Parameter:	$EG_{PJ,y}$
Data unit:	MWh / year
Description:	Net quantity of electricity generated in year y with biogas from the new anaerobic digester
Measurement procedures	The total electricity (from coal and biogas) generated is measured daily by an electricity meter. The quantity of electricity generated from biogas will be calculated based on the share of biogas (energy content) in the fuel mix (coal and biogas) going to the boiler. The share of biogas will be calculated based on amount of heat input of biogas and coal in the boiler. The net quantity of electricity generated from biogas is obtained by subtracting the electricity consumed by the project activity.
Monitoring frequency	Monitored daily
QA/QC procedures to be applied:	The electricity meters will be calibrated as per manufacturer specification.

Data / Parameter:	$HG_{biogas,y}$
Data unit:	TJ/year
Description:	Energy Content of biogas used in the boiler
Measurement procedures	The energy content of biogas used in boiler is calculated on the basis of NCV of biogas and the quantity of biogas utilized in the boiler.
Monitoring frequency	Monitored daily
QA/QC procedures to be applied:	

Data / Parameter:	$HG_{coal,y}$
Data unit:	TJ/year
Description:	Energy Content of coal used in the boiler
Measurement procedures	The energy content of coal used in boiler is calculated on the basis of NCV of coal and the quantity of coal utilized in the boiler.
Monitoring frequency	Monitored daily
QA/QC procedures to be applied:	

Data / Parameter:	$NCV_{Biogas,y}$
Data unit:	kJ/kg
Description:	Weighted average net calorific value of biogas in year y
Measurement procedures	The NCV of biogas will be measured in laboratory
Monitoring frequency	At least once in 3 months. The weighted average value will be calculated using this value.
QA/QC procedures to be applied:	The calorific value of biogas is fairly constant and will be determined though sample testing by an independent agency.

Data / Parameter:	$F_{PJ,effl,dig,m}$
Data unit:	m³ / month
Description:	Quantity of effluent from the digester in month m
Measurement procedures	The quantity of effluent will be continuously monitored online (PLC) with Flow Meters (electromagnetic flow sensor) having an accuracy of +/- 2%.
Monitoring frequency	Parameter monitored continuously but aggregated annually for calculations
QA/QC procedures to be applied:	Flow meters undergo maintenance/calibration in line with manufacturer's recommendations

Data / Parameter:	$F_{PJ,effl,lag,m}$
Data unit:	m³ / month
Description:	Quantity of effluent from the open lagoon or dewatering facility in which the effluent from the digester is treated in month m
Measurement procedures	The quantity of effluent will be continuously monitored online (PLC) with Flow Meters (electromagnetic flow sensor) having an accuracy of +/- 2%.
Monitoring frequency	Parameter monitored continuously but aggregated annually for calculations
QA/QC procedures to be applied:	Flow meters undergo maintenance/calibration in line with manufacturer's Recommendations

Data / Parameter:	$w_{COD,effl,dig,m}$
Data unit:	t COD / m³
Description:	Average chemical oxygen demand in the effluent from the digester in month m
Measurement procedures	A representative sample of waste water will be analysed for COD according to appropriate national or international standards by external laboratory. The appropriateness of the applied standards and the qualification criteria for the laboratories (e.g. accreditation) will be determined before starting monitoring activities and will be kept consistent over the whole crediting period.
Monitoring frequency	Weekly. Calculate average monthly and annual values
QA/QC procedures to be applied:	Measure COD parameter according to national or international standards -

Data / Parameter:	$w_{COD,effl,lag,m}$
Data unit:	t COD / m³
Description:	Average chemical oxygen demand in the effluent from the open lagoon or dewatering facility in which the effluent from the digester is treated in month m
Measurement procedures	A representative sample of waste water will be analysed for COD according to appropriate national or international standards by external laboratory. The appropriateness of the applied standards and the qualification criteria for the laboratories (e.g. accreditation) will be determined before starting monitoring activities and will be kept consistent over the whole crediting period.
Monitoring frequency	Weekly. Calculate average monthly and annual values
QA/QC procedures to be applied:	Measure the COD according to national or international standards

Data / Parameter:	$F_{biogas,y}$
Data unit:	Nm^3/yr
Description:	Amount of biogas collected in the outlet of the new digester in year y
Measurement procedures	The amount of biogas will be monitored continuously (online) using flow meters (type: thermal mass flow) having accuracy level of +/- 2%. The amount of biogas collected in the outlet of the digester will be the sum of biogas inlet in boiler, enclosed flare and open flares.
Monitoring frequency	Measured continuously with flow meter but aggregated annually for calculations.
QA/QC procedures to be applied:	Flow meters undergo maintenance/calibration in line with manufacturer's recommendations.

Data / Parameter:	$w_{CH_4,biogas,y}$
Data unit:	kg CH_4 / m³
Description:	Concentration of methane in the biogas in the outlet of the new digester
Measurement procedures	With continuous gas analyzer having accuracy of +/- 2%. The parameter is determined based on the continuous online measurement of volumetric fraction of methane in the biogas.
Monitoring frequency	Continuous analyzer
QA/QC procedures to be applied:	The project proponents shall define the error for different levels of measurement frequency. The level of accuracy will be deducted from average concentration of measurement. The analyzer needs to be in compliance with national or international standards. The continuous analyzer will be calibrated as per manufacturer specifications.

Data / Parameter:	$FV_{RG,h}$
Data unit:	m^3/yr
Description:	Volumetric flow rate of the residual gas in dry basis at normal conditions in the hour h
Measurement procedures	The volumetric flow rate will be measured using flow meter (type: thermal mass flow) have accuracy level of +/- 2%.
Monitoring frequency	Parameter monitored continuously. Values to be averaged hourly or at a shorter time interval
QA/QC procedures to be applied:	Ensure that the same basis (dry or wet) is considered for this measurement and the measurement of volumetric fraction of all components in the residual gas (fvi,h) when the residual gas temperature exceeds 60 ºC

Data / Parameter:	T_{flare}
Data unit:	℃
Description:	Temperature in the exhaust gas of the flare
Measurement procedures	Measure the temperature of the exhaust gas stream in the flare by a Type N thermocouple. A temperature above 500 ºC indicates that a significant amount of gases are still being burnt and that the flare is operating.
Monitoring frequency	Continuously

QA/QC procedures to be applied:	Thermocouples should be replaced or calibrated every year

Data / Parameter:	Other flare operation parameters – Flame detector
Data unit:	On/Off or numeric value indicating On/Off
Description:	Detection unit
Measurement procedures	The Sensor will be linked to the PLC system to monitor the flame. If the flame goes off and is not re-ignited within 20 mins, then the emission from that hour will not be included.
Monitoring frequency	Continuously
QA/QC procedures to be applied:	The detector will be replaced as per manufacturer specifications.

Data / Parameter:	$COD_{sludge,LA,y}$
Data unit:	tCOD / yr
Description:	Chemical oxygen demand (COD) of the sludge applied to land after the dewatering process in year y
Measurement procedures	A representative sample of sludge will be analysed for COD according to appropriate national or international standards by external laboratory.
Monitoring frequency	The COD of sludge will be measured whenever the sludge is removed from CIGAR and applied to land after dewatering.
QA/QC procedures to be applied:	Measure COD parameter according to national or international standards

Data / Parameter:	$S_{LA,y}$
Data unit:	tonnes / year
Description:	Amount of sludge applied to land in year y
Measurement procedures	The amount of sludge removed from CIGAR will be weighed and recorded in the log book.
Monitoring frequency	The parameter will be measured whenever the sludge is removed from CIGAR and applied to land after dewatering.
QA/QC procedures to be applied:	-

Data / Parameter:	$w_{N,sludge,y}$
Data unit:	tN / t sludge
Description:	Mass fraction of nitrogen in the sludge applied to land in year y
Measurement procedures	Parameter will be measured according to national or international standards.
QA/QC procedures to be applied:	Regularly, calculate average monthly and annual values

Equipment:

As described above all parameters will be measured/calculated using appropriate equipments (meters/sensors/thermocouples). The equipments used for monitoring and their accuracy, following the relevant national/international standards, are described in the above tables. The PDD provides a schematic figure of all the metering equipments that will be installed for monitoring purposes. This equipment setup is considered sufficient to carry out the monitoring requirements of the methodology, and it is acceptable to apply appropriate industry standards for maintenance and calibration.

Data:

Data management procedures consist of the following elements: measurement management, on-line monitoring

manual data recording system, regulatory requirements related to CIGAR project and data archiving. Each of these elements has been satisfactory described in the PDD**.** The data management procedures are considered appropriate to fulfil the monitoring requirements of the methodology and to ensure that emission reductions can be verified.

Organisation:

The PDD correctly describes the organisational structure (i.e. roles and responsibilities) to be implemented by the project developer in order to implement the monitoring plan. A specific CDM department will be established by the project owner and a CDM manager will be appointed to oversee that activities are carried out according to the monitoring plan. The CDM manager will be appointed with responsibility for monitoring all project related activities and organising training. All calculations will be checked and signed off by the CDM manager who will also be responsible for preparing and checking documents required for verification.

The CDM manager will lead the CDM monitoring team. The CDM monitoring team (reporting to the CDM manager) will have day to day responsibilities for checking instrumentation, record keeping, data handling and data processing, filing, reporting, organising repair and maintenance of monitoring equipment and ensuring the monitoring plan is adhered to as indicated in the approved PDD. The monitoring staff will receive technical training and refresher training as well as safety training to minimise exposure to workplace hazards.

The organisational structure is considered appropriate to fulfil the monitoring requirements of the methodology and the relevant tools and to ensure that emission reductions can be verified.

Quality Assurance and Quality Control:

The QA/QC of this project activity consists of data collection and management, maintenance and calibration of meters, treatment of missing or corrupted data, document control, preparation of monitoring report and audit function and management review. The monitoring staff will receive technical training and refresher training as well as safety training to minimise exposure to workplace hazards.

All meters will be purchased and maintained as specified in the CDM monitoring manual according to manufacturer specifications. All key meters will be subject to a quality control regime that will include regular maintenance and calibration. Calibrations will be carried out by the manufacturer or a suitably qualified external company. A record will be maintained showing the location and unique identification number of each meter, the calibration status of that meter and who performs the calibration service. Calibration certificates will be retained for all meters until two years after the end of the crediting period.

Based on the above, it can be stated that the PDD contains information on how quality will be controlled and assured in the monitoring of emission reductions, include information on calibration and maintenance of monitoring equipment and procedures for abnormal or emergency situations such as when the main meter(s) is not functioning.

Feasibility of the monitoring plan:

The means of implementation of the monitoring plan, including the data management and quality assurance and quality control procedures, are sufficient and in accordance with the requirements of the methodology. The devised monitoring plan and monitoring arrangements put into place are adequate to ensure that the emission reductions achieved by/resulting from the proposed CDM project activity can be reported ex post and verified.

3.6. Additionality

Start date

The project start date has been determined as 12 February 2010, which is the date of the 'signing of build operate transfer (BOT) [DR 63] contract by PT Indonesia Ethanol Industry and PT Biogas Energy Indonesia'. The BOT has been considered as credible evidence for determining the start date of the project activity based on the following:

- Both parties (PT Indonesia Ethanol Industry and PT Biogas Energy Indonesia) are Project Participants and are independent companies;
- Both parties are specialised companies in their own operational areas – one in ethanol production and the other in developing and running biogas projects but joining hands for the purpose of implementing this project;
- The BOT is a recognised and established legal arrangement for project development and financing mechanism, and it is also a recognised financial vehicle in project development under Indonesian law;
- The BOT is the financial and project development arrangement in this project so both Parties have vested interests and are under legal obligations for the implementation of the project. The fact that the BOT arrangement is essential for the implementation of the project, and without such (legal) arrangement the project cannot go ahead, makes it a strong case to be a valid consideration for determining the project start date;
- The BOT contract signing preceded the signing of construction contracts and the start of works for the project activity.

It may be noted that in response to one of the corrective action request (CAR 12) the project start date has been changed by Project Participants. The GSP version of the PDD indicated the project start date 26 November 2008 which was based on the

date of boiler purchase contract. Since the boiler was not part of the project activity therefore the project start date was changed to signing of the BOT contract.

The BOT contract has been verified by checking the original contract during the site visit, including the correctness of the signatures and stamps. The contents of the BOT contract were also verified which confirmed its legal nature, obligations for both parties and terms and conditions on both parties relating to the implementation, operation and transfer of the project activity on maturity.

It may also be noted that Project Participants undertook some early action relating to the implementation of the project which includes: Baseline Study in December 2009 [DR 23], Digester Construction Cost Quotation in April 2009 [DR 19] and Digester Maintenance Cost Quotation [DR 26]. But none of these actions represents and adheres to the requirements of the real action on the implementation of the project and hence can be considered as starting date of the project activity.

The BOT contract is considered a significant milestone in the development of the project activity and is also considered a reliable and reasonable as an evidence for the starting date of the project activity. The BOT contract also represents the earliest real action taken by Project Participants among the other actions towards the implementation of the project. Therefore, the start date of 12 February 2010 has been verified to be the earliest start of real action on the project (in accordance with the "Glossary of CDM terms") and it has been cross-checked through the associated activities and documents. The table below provides the details of project implementation along with timeline to demonstrate the validation of project starting date.

Table 3: Validation of the Start Date of the Project Activity and Prior Consideration of CDM

Activity	Date	Document / Evidence	Reference	Assessment
Gold Standard Stakeholder consultation meeting	20 January 2009	GS Local Stakeholder Consultation Report	[DR 48]	Original minutes of the stakeholder consultation meeting were checked
Notification to UNFCCC regarding commencement of project activity and intention to seek CDM status	19 April 2009	Notification by the Project Participants to the UNFCCC secretariat on the commencement of the project activity and intention to seek CDM status	[DR 28]	Notification was checked and verified that it was submitted to the UNFCCCC secretariat on 19 April 2009. The notification indicated the commencement of the project activity and development of the project as a CDM project activity.
EIA Approval for the Ethanol Plant	08 May 2009	EIA approval of the Ethanol Plant by the Government agency.	[DR 14]	The approval of the EIA by the government confirmed the investment on the project to proceed.
Board of Directors Meeting to discuss project and decision to proceed with the investment	18 January 2010	Board meeting invitation records and meeting minutes	[DR 33]	Meeting invitation to the Board members and meeting minutes were reviewed. The minutes of the meeting confirms that decision was taken by members to proceed with the investment on the project.
Signing of BOT agreement between PT. Indonesia Ethanol Industry and PT. Biogas Energy Indonesia. (project start date)	12 February 2010	Signing of the BOT contract between both parties to proceed with the implementation of the project.	[DR 63]	The signing of the BOT contract is a legal contract between both parties to implement the project. The contract also represents the commitment of both parties and sets the conditions of their engagement.
Contract awarded for Earth work of Anaerobic Digester	21 May 2010	Project development contract with an external body.	[DR 56]	Contract for earthwork for setting-up underground Anaerobic Digester. Set-up of Digester is a key element of project implementation.
Contract for supply of HDPE Geomembrane	07 September 2010	Equipment supply contract.	[DR 62]	Supply contract of HDPE Geomembrane which is the outer cover of the Digester. This equipment is also a key element of project implementation.
Contract for supply of flaring system	16/17 September 2010	Equipment supply contract.	[DR 34]	Supply contract of the supply of flaring system. This equipment is

Activity	Date	Document / Evidence	Reference	Assessment
				also a key element of project implementation.
Commissioning of project activity	July 2011 (expected)	Intended date of project commissioning	N/A	This is expected date of commissioning confirmed by the Project Participant.

Prior consideration of the CDM and timeline of real and continuing actions to secure CDM status

Since the start date of the project activity is 12 February 2010, the project activity is a new project with a starting date after 02 August 2008, and had not published its PDD for stakeholder comments prior to the start date. As per section B5 of the PDD and following the procedures notification of intent to seek CDM status was made to the UNFCCC secretariat on 19 April 2009 (DR 28). The host Party LoA was issued on 18 August 2010.

Therefore ERM CVS has validated the following:

- The project proponent informed the UNFCCC Secretariat in writing. The document, dated 19 April 2009, was provided for review [DR 28]. Furthermore, this notification received on 21 April 2009 has been confirmed from the UNFCCC website[1].
- The notification form is dated 19 April 2009. Furthermore, the Project Participant notified the UNFCCC of a change in the project start date (12 February 2010) on 23 April 2010 [DR 61]. The notification dated 23 April 2010 [DR 61] is within six months after the start date of project activity. The notification also indicated a change in the title of the project activity which was confirmed by the UNFCCC secretariat.
- The project location and the project description in the letter are consistent with the description in the PDD.

Furthermore, the project developer has undertaken continuing and real actions to secure CDM status, as outlined in the table in section B.5 of the PDD. The following documents have been checked by ERM CVS to substantiate the timeline:

Table 4: Prior consideration of CDM

Document	Date	Document Number (on document request list)
Digester Consultant quotation (CONFIDENTIAL)	January 2009	[DR 27]
Digester Construction Cost Quotation	April 2009	[DR 19]
CDM Notification to Indonesian DNA	03 April 2009	[DR 62]
Digester Maintenance Cost Quotation	06 April 2009	[DR 26]
Notification to UNFCCC regarding commencement of project activity and intention to seek CDM status	19 April 2009	[DR 28]
Approved EIA copy	May 2009	[DR 11]
Digester Construction Cost quotation (revision)	June 2009	[DR 19]
Baseline Study Report	December 2009	[DR 23]
Deed of Incorporation_ PT. Biogas Energy Indonesia (CONFIDENTIAL, permission to do wastewater, biogas related projects)	11 January 2010	[DR 13]
BOT Agreement (confidential), 12 February 2010	12 February 2010	[DR 63]
ERPA signed	20 February 2010	[DR 35]
Contract for Engineering Services with Waste Solutions	April 2010	[DR 54]
Start of GSP	06 April 2010	UNFCCC CDM Website
Date of formal validation contract of with ERM CVS	02 April 2010	[DR 64]
Letter of Approval from Indonesian DNA	18 August 2010	[DR 30]
Contracts related to parts of the WWT methane recovery installations	July-October 2010	[DR 58]

Taking into consideration that Project Participants have submitted the notification on the commencement of the project activity to the UNFCCC secretariat and also reviewing chronology of events, it is concluded that the Project Participants have undertaken continuing and real actions to secure CDM status for the project activity in parallel with its implementation.

Identification of alternatives:

[1] http://cdm.unfccc.int/Projects/PriorCDM/notifications/index_html

Applied baseline and monitoring methodology (ACM0014, version 3.1) requires identification of the baseline scenario following its own 4 steps, which overlap steps 1, 2 and 3 of the "Tool for the demonstration and assessment of additionality". These steps of the methodology are developed in section B4 of the PDD.

As per the requirements of the methodology, all technically feasible and complying with local laws and regulation alternatives have been analysed in order to determine the most realistic baseline scenario. Since the project activity involves all elements, namely wastewater treatment, heat and electricity generation, therefore, feasible alternatives for all elements and their possible combinations are included in the analysis.

An independent baseline study [DR 23] for wastewater treatment determined the most plausible baseline option taking into consideration different lagoon design specifications as required by the methodology. All lagoon design options were analysed on the basis of requirements of the applied methodology and design option 3, has been selected as the design for baseline for being the least cost option. The choice of the adequate baseline lagoon option was confirmed by the independent wastewater expert Prof. Tjandra Setiadi, PhD.

The Outcome of Step 1 concluded that all different combinations of wastewater treatment along with alternatives for heat and power generation were plausible.

Step 2 resulted into exclusion of W2 (direct release of wastewater to a nearby water body) which was not in compliance with local regulation which stipulates the maximum allowable limit of a variety of water pollutants contained in wastewater generated from ethanol facilities [DR 78]. This was validated based on the local and sectoral expertise and also based on the applicable regulation.

Outcome of Step 3 resulted into five remaining and possible alternative combinations (C1 – C5). Following the requirements of the additionality tool, a comparison of economic attractiveness of remaining alternative combinations (C1 – C5) was undertaken and concluded that alternative C1 (Waste water is treated in a series of anaerobic lagoons. and heat and power are generated in a fossil fuel co-generation plant) and C5 (Waste water is treated in an anaerobic digester and biogas (methane) is collected and co-fired in a co-generation plant) are the most viable options. Following the requirements of the methodology and the additionality tool, financial analysis based on Net Present Value of both options determined that option C1 is the most viable baseline scenario for the project activity. In undertaking the financial analysis, PPs took into consideration capital and O&M cost of both remaining options and based on the NPV, it is determined that C 1 scenario is the financially most attractive option, hence, is the baseline option for PPs.

Assumptions and input values in consideration of baseline scenario has been thoroughly validated by ERMCVS based on the evidences provided and verified through other sources and was found reasonable. Further analysis of cost elements and their validation is presented below.

ERM CVS assessed the list of alternatives given in the PDD and, through review of supporting documents (see validation protocol checklist, Appendix B), has confirmed that: a) the list of alternatives includes as one of the options that the project activity is undertaken without being registered as a proposed CDM project activity; b) the list contains all plausible alternatives that the DOE considers to be viable as a means of supplying the outputs or services that are to be supplied by the proposed CDM project activity; and c) the alternatives comply with applicable and enforced legislation.

ERM CVS considers that the list of alternatives is complete, their consideration and analysis is thorough and their subsequent elimination is well justified.

Additionality determination:

Investment analysis has been used to demonstrate additionality. The applied methodology (ACM0014 version 3.1) requires a step wise approach to identify the baseline scenario, which includes a barrier analysis (step 3) and, if more than one alternative is not prevented by prohibitive barriers, which is the case of the project activity, then a comparison of the economic attractiveness (step 4) of each alternative has to be made. Step 3 of ACM0014 overlaps with step 3 of the "Tool for the demonstration and assessment of additionality", while step 4 of the methodology coincides with step 2 of the tool. The results of the comparison analysis (NPV of each alternative) in section B4 of the PDD were used as the basis for the investment analysis and additionality demonstration in B5.

The PDD demonstrates the fact that the project activity without CDM revenue would be less financially attractive than the baseline.

The investment analysis was assessed by the validation team, including assessment of the spreadsheet and evidences relating to the input values to the investment analysis. The analysis was also assessed in detail against the 'Guidelines on the assessment of investment analysis' (version 3.1). This task was performed by ERM CVS' financial expert in the validation team (see section 1.4), who has specific expertise in the assessment of financial analysis for CDM projects. Further explanation of the elements of additionality determination and ERM CVS's validation are set out below.

Investment analysis:

The investment analysis is described in the PDD and spreadsheets are provided with the calculations of NPV and sensitivity analysis. First version of the financial analysis was revised by Project Participant in response to questions raised by ERM CVS. Therefore, a second and final version [DR 2] was submitted which was used for the assessment and conclusions by ERM CVS. In the following, every reference to financial data refers to this latest version in [DR 2].

The Project Participants, in the PDD, determined that the proposed project activity is not:

- The most economically or financially attractive; or
- Economically or financially feasible, without the revenue from the sale of certified emission reductions (CERs).

Hence, investment analysis can be conducted.

Determine appropriate analysis method

The additionality tool provides different options for undertaking the investment analysis which includes simple cost analysis (Option I) and investment comparison analysis (Option II) and benchmark analysis (Option III).

The PDD adopts Option II, investment comparison, which is appropriate for this type of project activity, because in this case, 'doing nothing' (making no investment) is not an alternative as the facility is 'Greenfield' and some solution for wastewater treatment has to be implemented by Project Participants which is that the wastewater will be treated in open lagoons.

Given that under the project activity the wastewater will be treated and will provide biogas for the generation of electricity and heat, Option I is not appropriate.

Apply Investment Comparison Analysis

Net Present Value (NPV) has been chosen as the financial indicator for the investment comparison analysis. This is considered suitable as the baseline scenario does not generate any revenue and because the investment is largely up-front while the benefits will follow for years after the implementation of the project. NPV is a commonly used financial indicator for this type of investment projects.

Determination of the discount rate

The discount rate used for the financial analysis is the interest rate of commercial banks for investment loans. The rate is based on publicly available data from Bank of Indonesia's website [DR 32]. Taking into account that the decision to proceed with the investment on the project was taken in January 2010 in the Board of Directors Meeting [DR 33], the interest rate of 12.96% for commercial banks for investment loans in Rupiah in December 2009 has been used as the discount rate. This rate is confirmed to be the lowest monthly rate for the year (February 2009 to January 2010) and is conservative compared to other bank rates. This discount rate is applied equally for both alternatives. All calculations in the investment analysis are pre-tax.

Calculation and comparison of financial indicators

The PDD presents the key input parameters and results of the assessment of the NPV of the project. ERM CVS reviewed the spreadsheet calculations and found that the computations are correctly presented, traceable, and consistent with the information presented in the PDD [DR 1].

Taking into consideration that under the project activity a part of the electricity and heat requirements (29%) will be met through generation of the biogas, with associated displacement of fossil fuel (coal), financial analysis of the project presents the financial comparison of the baseline and project activity for cost savings achieved through the reduction in the cost of the coal in the project scenario. Since the financial analysis is based on the cost savings from coal consumption, a thorough analysis of the coal consumption and coal prices for the project scenario has been undertaken by ERM CVS. The "Investment Comparison Analysis" spreadsheet presents the detailed financial analysis of the project activity [DR 2]. Further validation of the coal prices is presented below.

The investment comparison analysis adopted by the Project Participants in the PDD is based on the cost of the energy to the implementation of the project activity and resulting NPV for baseline and project activity calculates -53,691 and - 67,574 respectively.

ERM CVS reviewed the financial analysis of the project based on the energy saving (difference in the cost of coal as revenue) and the NPV of the project activity without CDM income is calculated as IDR -21,044m, compared to IDR -6,918m in the alternative. Therefore, based on the calculation of NPV both in cases (energy cost and energy saving), it can be concluded that the project is economically less attractive than at least one feasible alternative and thus is additional.

The calculations were carried out over an assessment period of 10 years, with 1 year of construction time. It is recognised that the ethanol plant and the co-generation system (boiler and generator) would last longer than this but these are not part of the project activity. It is confirmed that cost of the boiler and generator are not included in the project cost for the wastewater treatment. For the project activity, this assessment period is based on the guaranteed economic life of the biodigester (CIGAR) equipment. ERM CVS confirmed the Project Participant's opinion that the replacement or overhaul of this equipment after 10

years would represent a significant investment, based on the industry practice, and the approach to assess it as a new investment decision is reasonable.

It may also be noted that the ethanol plant owners plan to ramp up the ethanol plant over the first three years from 30% in first year, 50% in 2nd year 75% in 3rd year and 100% from 4th year onwards. This key consideration has been validated in the confirmation of the financial analysis of the project activity. It was also validated that even with a variation in ramping up than that assumed in the investment comparison analysis (as above), the additionality argument will still hold true.

ERM CVS is conscious of the fact that the baseline scenario for the project entails digging lagoons only, which typically last longer than 10 years; however, based on the cost considerations relating to the replacement of equipment, 10 years of project lifetime and also the assessment period is reasonable.

Based on the ERM CVS local expertise and sectoral knowledge it is confirmed that there are no relevant subsidies or tax breaks applicable to the project activity.

Assessment of parameters and assumptions

The key financial parameters and assumptions are:

- the capital cost of the open lagoon system in the baseline scenario,
- the capital cost of the project activity,
- the operation and maintenance cost both for baseline and project activity,
- the price/ cost of coal, and
- the amount of methane generated.

The capital cost of the baseline lagoon system mainly consists of civil works and costs related to machines and instruments. The capital cost of the baseline lagoon system has been validated by assessing the Baseline Study and associated revisions [DR 23] and further reviewed by a wastewater independent expert, contracted by ERM CVS, and were confirmed to be reasonable [DR 72, DR 73]. Further validation of cost elements have been undertaken by cross-checking the unit price of main material (concrete, steel and plywood) from publically available information from suppliers [DR 100]. The review of capital cost and cross-verification from other sources and by the independent expert determined that consideration of capital cost in the baseline is reasonable and consistent with industry practices. Operation and maintenance cost relating to the baseline mainly comprises maintenance cost (consumption of electricity), chemical consumption (caustic soda) cost and labour cost. The cost of electricity has been validated based on the information publicly available tariff information [DR 98], whereas cost of consumption of the chemical is based on the baseline study and further verified from the supplier invoice of the caustic soda [DR 99]. Whereas, labour cost is based on the baseline study report. ERM CVS based on its local and sectoral expertise as well as validated by the independent water expert is able to confirm that all cost elements are included in the financial analysis and input values are reasonable.

The capital cost of the project activity includes construction and equipment cost, such as, wastewater treatment plant, digester construction and methane burner control equipment. All construction and equipment costs are based on construction and equipment supplier quotations provided by potential contractors and equipment suppliers as available at the time of the investment decision [DR 100]. Since then, ERM CVS reviewed actual contracts and actual prices as they have become available as the project developed in order to cross-check these original estimates [DR 18, DR 19, DR 25 – DR 27, DR 34, DR 39, DR 54 - DR 57, DR 59, DR 60, DR 94]. The actual cost information reveals that the original estimates were slightly higher than actual costs but were within 10% range. This is well within the limits of the sensitivity analysis (see below), which shows that even a 40% reduction in the capital cost of the project activity would not result in the project activity being more economically attractive than the alternative. Therefore the impact of the capital and O&M cost in the baseline scenario on the NPV is minimal and there is no impact on whether the project remains additional.

The cost of coal has been calculated on the basis of average price over the period of last 5 years. The price is evidenced through supporting documentation from a local coal miner/ supplier [DR 36 - 38] and a coal price quotation from a potential coal supply agent [DR 39]. Cost assumptions have also been checked and validated and are considered reasonable given the fluctuations of the market price for coal. Further validation of coal prices is presented below.

The amount of methane estimated to be generated has been validated by cross-checking with the ethanol factory design specifications [DR 95], the EIA report [DR 11], and the specifications of the biodigester system [DR 18]. Methane generation potential has also been validated as part of validating the emissions reductions calculations.

Financial analysis checklist: the financial analysis has been assessed by the validation team, including a financial expert subcontracted by ERM CVS to assess the accuracy and conservativeness of the analysis. The following checklist highlights the key points that were checked:

Table 5: Validation of financial analysis

Issue	Notes	Check	Cross check
Financial analysis method	Additionality tool followed. Investment	Consistent with additionality tool	Consistent with Guidelines on the

Issue	Notes	Check	Cross check
	Comparison Analysis applied		assessment of investment analysis
Benchmark type	Discount rate applied based on Indonesian commercial bank interest rates	Checked against supporting reference http://www.bi.go.id/seki/tabel/TABEL1_31.pdf	Applied equally and consistently to both investment alternatives compared
Financial indicator	Net Present Value (NPV) is used	This is appropriate, particularly as the alternative does not generate any income (return).	Pre-tax NPV is applied to both
Assessment period	10 years plus 1 year construction	Reasonable and consistent with the expected lifetime of the key assets	10 years is less than the expected life of the lagoons in the baseline so this is conservative for a comparison of NPVs
Inclusion of all costs and revenues	All costs are included No revenues are earned	All relevant costs and revenues were included. No other potential revenue streams were identified for this type of project. No relevant subsidies or tax breaks apply. Reduced coal requirement is input as a cost saving	This is realistic based on sectoral and local knowledge. Cross-checked against actual contracts and quotations where possible
Annual methane generation – correct?		Based on the amount and chemical composition of the wastewater	Cross-checked against design of ethanol factory and bio-digester specifications
Static total investment – correct?		Based on the Baseline Study Report for the baseline Estimated based on original quotations and then revised upwards to account for implementation/ EPC costs	Independent wastewater expert has validated costs Cross-checked against actual contracts and costs as available
Depreciation	Not relevant as a pre-tax calculation was applied		
Insurance fee		Based on quotation estimates	Consistent with actual contracts
Maintenance costs		Based on quotation estimates	Consistent with actual contracts
Coal cost		Based on average coal price from nearby coal mine over the last 5 years. Allows for variation in coal price	Consistent with actual coal quotation received from a local supplier
Residual value		5% of fixed asset cost	In line with industry averages and sectoral knowledge
Income tax	N/A as not applied		
Sensitivity analysis		Conducted on key variables	Confirms that the project activity is additional even with a range of likely variations in key variables, including coal price and project activity investment costs
Spreadsheet		Traceable spreadsheet provided	Spreadsheet is consistent with PDD and documentary evidence

Further details of the cross checks carried out can be found in Appendix B (CDM Validation Protocol Checklist) below.

Coal price: Coal price is a key variable in the demonstration of additionality as the main financial benefit of the project activity, other than CER revenue, is the displacement of coal with methane and a reduction in the cost of purchasing coal. The coal price is assumed as the average coal price (IDR 440,125) over the last 5 years (IDR 266,000, IDR 331,000, IDR 346,000, IDR 506,000 and IDR 751,623) in order to account for price fluctuations and is evidenced by information from a nearby major coal supplier [DR 36 - 38]. This is considered reasonable given the price fluctuations in the coal market. ERM CVS requested further evidence to justify the coal price which the Project Participant provided in the form of a quotation from a local coal supplier [DR 39]. While the coal price in the quotation is more than 10% higher than the assumed input coal price, this is considered reasonable given the average coal price in the last 5 years and recent fluctuations in coal price. It is recognised that it is not possible to forecast coal prices in a realistic manner. It is also demonstrated that even if the higher current coal price is assumed as from the quotation, or indeed if the highest of the 5 years used to calculate the average the project is still additional (as per the sensitivity analysis).

Operation & maintenance costs

Operational costs are mostly comprised of 'maintenance costs' and also some monitoring costs. The O&M cost is about 3% of the project CAPEX. It is also noted that the operational costs of the project activity is almost three times that of the baseline scenario but this is reasonable due to the complex and technical nature of the bio-digester system compared to open lagoons. A breakdown of the project O&M cost have been provided which is also supported by cost quotations from equipment suppliers [DR 34, DR 58 – DR 60, DR 94]. The baseline scenario maintenance costs are supported by the Baseline Study Report and associated spreadsheets, and were reviewed by the independent wastewater expert [DR 72, DR 73].

Based on the review of evidences and documentation from independent equipment suppliers and also based on our local and sectoral knowledge, ERMCVS is able to confirm that considered O&M cost is reasonable with respect to the implementation of the project activity.

Plant load factor

The wastewater treatment facility is expected to be operational 300 days a year / 7,200 hours a year [DR23]; the anticipated load factor is 82%. In the baseline scenario, the boiler of the ethanol factory would be fuelled entirely by coal. In the project activity, some of this coal would be displaced by biogas from the wastewater treatment system. The Project Participant estimates that approximately 30% of the coal would be displaced by biogas, based on the amount of methane to be generated, which in turn is based on the amount of wastewater and the Chemical Oxygen Demand (COD) content of that wastewater. The value is derived from the methane generation estimate of 18,000m^3/day as provided by the digester designer.

Sensitivity Analysis

The sensitivity analysis demonstrates that the result of the investment comparison is not particularly sensitive to variations in the estimated value of the key variables. The variables considered for the analysis are coal prices, capital cost, O&M costs and variations in methane production.

Coal Price: The coal price has varied greatly over the last 5 years, much more than the 10% variation shown in the sensitivity analysis. However, ERM CVS notes that even a 50% increase in the coal price does not change the additionality of the project activity. The Project Participant has also explained that the coal prices in 2008/09 were unusually high and represented a sudden peak caused by a supply/demand imbalance. Further evidence of the coal price in 2010 has been provided to prove that coal prices have declined and appear to be returning to 'normal' lower levels. The 2010 coal price is 23% lower than the 2009 price (DR 37, DR 38). While the coal price might increase above inflation over the assessment period, it is not possible to reliably forecast such increases and in any event, the price is unlikely to increase by 50% and have serious impact on the additionality of the project.

Capital Costs: Even a 40% reduction in the capital cost of the project activity would not result in the project activity being more economically attractive than the alternative. Given that capital costs are now mostly contracted, and shown to be within 10%, such a decrease is not possible.

Power Requirements: Only significant variations in the power requirements will have an impact on the additionality of the project. An increase of 50 % is demonstrated not to have an impact on the additionality. Since such an increase is unlikely therefore this parameter does not affect the additionality of the project activity.

Annual O&M Cost: Even if the maintenance costs of the project activity were zero, the project activity would still be less economically attractive than the alternative and thus still additional.

Methane Generation: Variations in methane production have now also been assessed and demonstrate a lack of sensitivity. Even with an increase of 50% in the estimated methane generation the project activity would still be additional.

Barrier analysis

Barrier analysis is not used to demonstrate additionality, although in the GSP version of the PDD the Project Participant presented arguments to show that the project activity does face technical risks and some barriers to access to funding.

Common Practice Analysis
The Project Participants have performed a survey [DR 96] for similar plants in Indonesia, which is regarded to be the appropriate geographical area. The survey covers the historical period in Indonesia before submission of the GSP-PDD (version 1) to the DOE which can also be regarded as appropriate. It was found that open lagoons without recovery of methane were found to be the standard operating practice in Indonesia because of low investment, low operation and maintenance cost, simple operation system and proven effectiveness. Furthermore, this practice is in compliance with Indonesian laws and regulations.

The survey identified that there are 4 similar ethanol plants in Indonesia with comparable ethanol production capacity as in the proposed project activity. The following table presents the existing ethanol plants with similar capacity and whether or not their waste water treatment system includes methane capture.

No	Company	Capacity (ton / year)	Methane Capture and Utilization technology	Remarks made by Project Participant
1	PT. Molindo Raya Industrial	40,000	No methane capture	Not comparable
2.	PT. Indolampung Distillery	40,000	No methane capture	Not comparable
3	PT.Indo Acidatama Tbk	36,000	No methane capture (Open lagoon)	Not comparable
4	PT. Medco Ethanol Lampung	50,000	Continuously Stirred Tank Reactor (CSTR)	Applied for CDM

Out of the four plants there is only one ethanol plant which has a methane capture and utilization system. This project applied for CDM and doesn't need to be included in the common practice analysis [DR 97].

Based on these data, it is confirmed that there is no operational activity similar to the project activity (in the same defined region, rely on a broadly similar technology, are of a similar scale, and take place in a comparable environment with respect to regulatory framework and investment climate). The essential distinction with existing comparable activities is that in this project activity the Cigar (closed reactor) is used with recovery of methane.

Based on the ERM CVS validation, the project activities identified as similar with the project activity are reasonable and that the project activity is not considered not being common practice in Indonesia.

3.7. Calculation of GHG Emissions

Describe whether the appropriate steps in the methodology and tools have been followed to calculate emission reductions.

Baseline emissions:

For the baseline emissions calculations, the Project Participant used the following formula, which is fully compliant with ACM0014 version 3.1.

$$BE_Y = BE_{CH_4,y} + BE_{EL,y} + BE_{HG,y}$$

Where:

BE_Y = Baseline emissions in year *y* (tCO2e / yr)

$BE_{CH_4,y}$ = Methane emissions from anaerobic treatment of the wastewater in open lagoons (scenario 1) or the anaerobic treatment of sludge in sludge pits (scenario 2) in the absence of the project activity in year *y* (tCO2e / yr)

$BE_{EL,y}$ = CO2 emissions associated with electricity generation that is displaced by the project activity and / or electricity consumption in the absence of the project activity in year *y* (tCO2 / yr)

$BE_{HG,y}$ = CO2 emissions associated with fossil fuel combustion for heating equipment that is displaced by the project in year *y* (tCO2 / yr)

For this project, for $BE_{CH4,y}$ the scenario 1 is applicable to the proposed project activity: anaerobic treatment of the wastewater in open lagoons for BE_{CH4}

According to the ACM0014 version 3.1, baseline emissions are calculated in three steps, as follows:

Step 1: Calculation of baseline emissions from anaerobic treatment of the wastewater or sludge;
Step 2: Calculation of baseline emissions from generation and consumption of electricity;
Step 3: Calculation of baseline emissions from heat generation.

For this project activity, the Project Participant have implemented the above explained stepwise approach and presented the 3 steps in the PDD which are discussed in the following.

Step 1: Calculation of baseline emissions from anaerobic treatment of the wastewater or sludge;

For the Calculation of baseline methane emissions from anaerobic treatment of the wastewater or sludge the Project Participant choose the Methane Conversion Factor Method in which the emissions from anaerobic treatment of the wastewater in open lagoons are estimated based on:

- The chemical oxygen demand (COD) of the wastewater that would enter the baseline lagoon ($COD_{PJ,y}$);
- The maximum methane producing capacity (Bo); and
- The methane conversion factor ($MCF_{BL,y}$) which expresses the proportion of the wastewater that would decay to methane.

The formula to be used according to the methodology is:

$$BE_{CH_4,y} = GWP_{CH_4} \times MCF_{BL,y} \times B_o \times COD_{BL,y}$$

Where:

$BE_{CH_4,y}$ = Methane emissions from anaerobic treatment of the wastewater in open lagoons in the absence of the project activity in year *y* (tCO2e / yr)

GWP_{CH_4} = Global Warming Potential of methane valid for the commitment period (tCO2e/tCH4)

$MCF_{BL,y}$ = Average baseline methane conversion factor (fraction) in year *y*, representing the fraction of $B_o \times COD_{PJ,y}$ that would be degraded to CH_4 in the absence of project activity

B_o = Maximum methane producing capacity, expressing the maximum amount of CH_4 that can be produced from a given quantity of chemical oxygen demand (tCH4/tCOD)

$COD_{BL,y}$ = Quantity of chemical oxygen demand that would be treated in open lagoons in the absence of the project activity in year *y* (tCOD/yr)

The above formula was applied correctly by the Project Participant to determine $BE_{CH_4,y}$.

Determination of $COD_{BL,y}$ in the $BE_{CH_4,y}$ formula.

For the determination of $COD_{BL,y}$ the formula:

$$COD_{BL,y} = AD_{BL} \times COD_{PJ,y}$$

was used, which is in accordance with ACM0014, version 3.1 with the following explanation of the terms.

$COD_{BL,y}$ = Quantity of chemical oxygen demand that would be treated in open lagoons in the absence of the project activity in year y (tCOD/yr)

AD_{BL} = Effluent adjustment factor expression the percentage of COD that is degraded in open lagoons in the absence of the project activity

$COD_{PJ,y}$ = Quantity of chemical oxygen demand that is treated in the anaerobic digester or under clearly aerobic conditions in the project activity in year y (tCOD/yr)

For AD_{BL}, the methodology makes distinction between Greenfield and existing facilities. And for Greenfield facilities design features of the baseline scenario shall have to be considered. The Project Participant used the required formula for Greenfield correctly:

$$AD_{BL} = 1 - \frac{COD_{out,x}}{COD_{in,x}}$$

Where:

AD_{BL} = Quantity of chemical oxygen demand that would be treated in open lagoons in the absence of the project activity in year y (tCOD/yr)

$COD_{out,x}$	=	Design COD outflow from the baseline anaerobic lagoon in the period x (t COD)
$COD_{in,x}$	=	Design COD inflow to the baseline anaerobic lagoon in the period x (t COD)
x	=	Representative historical reference period (at least one year)

Then the next term to be elaborated is the $COD_{PJ,y}$ and for this term the following formula has been used, which is in accordance with the methodology.

$$COD_{PJ,y} = \sum_{m=1}^{12} F_{PJ,dig,m} \times w_{COD,dig,m}$$

Where:

$COD_{PJ,y}$	=	Quantity of chemical oxygen demand that is treated in the anaerobic digester or under clearly aerobic conditions in the project activity in year y (tCOD/yr)
$F_{PJ,dig,m}$	=	Quantity of wastewater or sludge that is treated in the anaerobic digester or under clearly aerobic conditions in the project activity in month m (m³ / month)
$w_{COD,dig,m}$	=	Average chemical oxygen demand in the wastewater or sludge that is treated in the anaerobic digester or under clearly aerobic conditions in the project activity in month m (t COD / m³)
m	=	Months of year y of the crediting period

After assessment of the used formulas and values for the $COD_{PJ,y}$ determination, ERM CVS concluded that this term has been determined according to the methodology with use of appropriate values.

Determination of $MCF_{BL,y}$ in the $BE_{CH_4,y}$ formula.

According to AM0014, version 3.1, the $MCF_{BL,y}$ is to be determined with the following formula:

$$MCF_{BL,y} = f_d \times f_{T,y} \times 0.89$$

$MCF_{BL,y}$	=	Average baseline methane conversion factor (fraction) in year *y*, representing the fraction of ($COD_{PJ,y}$ x Bo) that would be degraded to CH4 in the absence of the project activity
f_d	=	Factor expressing the influence of the depth of the lagoon or sludge pit on methane generation .In the case of the project activity as the baseline scenario anaerobic lagoon has a depth greater than 5m the value applied is 70%.
$f_{T,y}$	=	Factor expressing the influence of the temperature on the methane generation in year *y*
0.89	=	Conservativeness factor as per ACM0014 version 3.1

For this formula, the Project Participant developed the f_d and the $f_{T,y}$ according to the methodology and used the appropriate values and also the conservativeness factor as per ACM0014 version 3.1 was taken into account. Hence, the $MCF_{BL,y}$ was concluded to be determined correctly.

Based on the above, ERM CVS concludes that Step 1: Calculation of baseline emissions from anaerobic treatment of the wastewater or sludge has been developed according to the methodology and the determination is correct.

Step 2: Calculation of baseline emissions from generation and consumption of electricity;

According to the methodology there are two sources for baseline emissions which should be accounted for as follows:

- Baseline emissions from consumption of electricity associated with the treatment of wastewater;
- If electricity is generated with biogas from a new anaerobic digester under the project activity: baseline emissions from the generation of electricity in the grid (E2) and / or with a captive fossil fuel fired power plant (E1) in the absence of the electricity generation with biogas.

Baseline emissions from the generation and / or consumption of electricity are calculated as follows:

$$BE_{EL,y} = \left(EC_{BL,y} + EG_{PJ,y}\right) \times EF_{BL,EL,y}$$

Where:

$BE_{EL,y}$	=	CO2 emissions associated with electricity generation that is displaced by the project activity and / or electricity consumption in the absence of the project activity in year y (tCO2 / yr)
EC_{BL}	=	Annual quantity of electricity that would be consumed in the absence of the project activity for the treatment of the wastewater (MWh / yr)
$EG_{PJ,y}$	=	Net quantity of electricity generated in year y with biogas from the new anaerobic biodigester (MWh / yr)
$EF_{BL,EL,y}$	=	Baseline emission factor for electricity generated and / or consumed in the absence of the project activity in year y (tCO2 / MWh)

These two sources have been included in this project activity and the formula for $BE_{EL,y}$ has been applied correctly.

The baseline emission factor was determined in accordance to ACM0014 version 3.1 [DR 5], equation (16),

$$EF_{BL,EL,y} = MIN(EF_{grid,y}; EF_{BL,EL,captive})$$

choosing the lower emission factor between the grid emission factor and the emission factor of the captive co-generation plant as a conservative simplification.

The grid emission factor was calculated in accordance to the Tool to calculate the emission factor for an electricity system, version 2 [DR 8]. All methodological choices taken, and equations used were validated and found to be correctly applied to the project activity. ERM CVS checked the information provided in the emission factor calculation spreadsheet [DR 40] for appropriateness, and confirms that calculations were correctly applied. $EF_{grid,y}$ = 0.716 tCO_2e/MWh. The grid emission factor endorsed by the Indonesian DNA is slightly higher ($EF_{grid,y}$ = 0.743 tCO_2e/MWh) [DR 41], and hence ERM CVS deems the adaptation of a more conservative grid emission factor to be conservative and appropriate.

The emission factor of the captive power plant was determined based on equation (17) of ACM0014 version 3.1 [DR 5]:

$$EF_{BL,EL,captive} = \frac{EF_{CO2,FF,captive}}{\eta_{EL,captive}} \times 3.6$$

The validity of the input values was checked by comparing the calculation against the tab “cogeneration plant eff” in the final version of the Emission Reduction spreadsheets [DR 3], the technical specifications for the boiler [DR 16] and default IPCC 2006 values (at the lower range of the confidence interval). $EF_{BL,EL,captive}$ = 0.390 tCO_2e/MWh.

The emission factor of the the captive co-generation plant ($EF_{BL,EL,captive}$) was determined ex ante, and was adopted as conservative baseline emission factor ($EF_{BL,EL,y}$) since being lower than the grid emission factor. $EF_{EL,BL,y}$ = $EF_{BL,EL,captive}$ = 0.390 tCO_2e/MW. It will remain fixed throughout the crediting period, and it was therefore validated that all data sources and assumptions were appropriately chosen by the PP and calculations are correct and applicable to the proposed CDM project activity. ERM CVS confirms, based on its sectoral and technical expertise, that the data and parameters provided for in the PDD and calculation spreadsheets are accurate and credible, since they are now based on the technical specifications of the already purchased equipment, and therefore will result in conservative ex ante emission reductions.

Based on the above, the baseline emission reductions related to $BE_{EL,y}$ were appropriately estimated.

Step 3: Calculation of baseline emissions from heat generation.

As per the requirements of the methodology this step is not required in this project activity.

Summary step 1 – step 3
The baseline emissions for the project activity have been determined in accordance with the methodology and have been estimated appropriately.

Project emissions:

The project emissions can be related to several sources as stated in the methodology.

$$PE_y = PE_{CH_4,effluent,y} + PE_{CH_4,digest,y} + PE_{flare,y} + PE_{sludge,LA,y} + PE_{EC,y} + PE_{FC,y}$$

PE_y	=	Project emissions in year y (tCO2e / yr)
$PE_{CH_4,effluent,y}$	=	Project emissions from treatment of wastewater effluent from the anaerobic digester in year y (tCO2e / yr)
$PE_{CH_4,digest,y}$	=	Project emissions from physical leakage of methane from the anaerobic digester in year y (tCO2e / yr)
$PE_{flare,y}$	=	Project emissions from flaring of biogas generated in the anaerobic digester in year y (tCO2e / yr)
$PE_{sludge,LA,y}$	=	Project emissions from land application of sludge in year y (tCO2e / yr)
$PE_{EC,y}$	=	Project emissions from electricity consumption in year y (tCO2e / yr)
$PE_{FC,y}$	=	Project emissions from fossil fuel consumption in year y (tCO2e / yr)

The Project Participant has taken all these potential sources into account.

Project methane emissions from effluent from the digester

For the first term in the project emission formula, $PE_{CH_4,effluent,y}$, the Project Participant strictly follows the methodology with same formulas, which is appropriate and the made choices and chosen values are concluded to be fair and accurate.

Project emissions related to physical leakage from the digester

For the second term in the project emission formula, $PE_{CH_4,digest,y}$ the Project Participant strictly follows the methodology with same formulas, which is appropriate and the made choices and chosen values are concluded to be fair and accurate.

Methane emissions from flaring

For the third term in the project emission formula, $PE_{flare,y}$, the Project Participant uses the "Tool to determine project emissions from flaring gases containing methane" (latest version) which is according to the methodology.
The Project Participant proposes to use a 90% default value as the enclosed flare efficiency, which is in accordance with the "Tool for flaring", provided that an enclosed flare is used during the project activity.
The Project Participant proposes to use a 50% default value as the open flare efficiency, which is in accordance with the "Tool for flaring", provided that an open flare is used during the project activity.
The Project Participant estimates the project emission for both cases, open and enclosed flare. The estimated time that the flare is used during the project activity (one hour per week during normal operating periods and 4 days during Ramadan period, is reasonable, given the fact that the gas can be buffered in the waste water treatment facility).
For the project emission calculations, both cases are further calculated, according to the methodology in a correct way.
The last step the Project Participant takes is that the calculated emissions for both open and closed flare are summarized (since it is not yet known if an open or closed flare will be used). The summation of both results can be regarded as conservative approach (in real the project emissions will be lower).
Based on the determined methane emissions from flaring it can be concluded that the made choices and chosen values are conservative and fair.

Project emissions from land application of sludge
The Project Participant expects that negligible amounts of sludge will be generated, but for the ex ante calculations assumes 15 t/y which can be regarded as conservative. In addition, even though the Project Participant expects a negligible amount of sludge, it still will be monitored and accounted for during the project. This is all acceptable.
For the estimation of the project emissions related to sludge, the Project Participant applies the formulas from the methodology in a correct way. The conservative factor 0.05 is used for MCF according to the methodology.
Based on the determined methane emissions from land application of sludge it can be concluded that the made choices and chosen values are conservative and fair.

Leakage:
The Project Participant concluded that according to ACM0014 version 3.1, leakage is not necessary to be considered which is correct.

Conclusion:

The assumptions and data used to determine the emission reductions as listed in the PDD and all the sources have been checked and confirmed by ERM CVS, and the calculations can be replicated. The correct transcription of all key input values used in the Emission Reduction spreadsheet [DR 3] i.e. the baseline lagoon design parameters $COD_{in,x}$ and $COD_{out,x}$ were confirmed via cross-checks with the Baseline Study Report [DR23] and interviews with the wastewater expert Prof. Tjandra Setiadi, PhD. ERM CVS confirms these values resulting in an accurate and conservative ex-ante estimation of baseline emission reductions.

Based on the information reviewed, the sources used are correctly quoted and interpreted in the PDD, the calculations are complete, and the numbers are reasonable and accurate or conservative, and that the methodology and tools have been correctly applied.

Parameters determined ex-ante

Section B.6.2. of the PDD specifies the ex ante determined parameters and for each parameter it was checked if determination was according to the methodology and if the correct assumptions and (default) values have been applied. After closure of all CARs and CLs this was the case. The ex ante determined parameters have been described in and have been validated in detail in section 8.15 of the validation protocol checklist below.

The ex ante determination for all parameters is concluded to be fairly stated and accurate

3.8. Environmental and Sustainable Development Impacts

The project activity is part of the larger development of the ethanol factory. The potential environmental impacts of the ethanol factory and thus the project activity were assessed and reported in an Environmental Impact Assessment, prepared by WIRA PERSADA, an external body, in April 2009, in accordance with local environmental regulations [DR 14]. The project activity has been designed to meet the regulation/ standard on effluent discharge, Keputusan Menteri Negara Lingkungan Hidup, nomor Kep-51/MENLH/10/1995 Tentang Baku Mutu Limbah Cair Bagi Kegiatan Industri (The State Ministry of Environment Decree no Kep-51/MENLH/10/1995 on the Wastewater Standard for Industrial Activities). The EIA concludes that no significant environmental impacts are expected from the project. Impacts that are identified are subject to mitigation measures, and these are accurately described in the final PDD.

The letter of approval by the DNA of the host country confirms the contribution of the proposed CDM project activity to the sustainable development of the host Party.

3.9. Comments by Local Stakeholders

Comments from local stakeholder were sought through a stakeholder consultation meeting, via an evaluation form and sustainable development checklist. The meeting took place at the community hall of Sriwijaya Mataram village, a public facility located 1 km from the project location. Project Participants undertook extensive measures to maximise participation of local stakeholders in order to provide them an opportunity to raise their concerns and ask questions relating to the implementation of the project activity.

The stakeholder consultation meeting was held on 20 January 2009 and 55 people attended. Overall comments received through the Q & A session and the questionnaire were positive. Main concerns were relating to the possibility for biogas leakage and the HDPE cover quality. The suggested measures by the Project Participants included regular monitoring of the cover and the biogas pipes. Furthermore, Project Participants will submit an Environmental Management Procedure (UKL) and Environment Monitoring Procedure (UPL).

The consultation process was validated by cross-checking with the provided documentation (DR 42 – DR 47, DR 65). ERM CVS also conducted a limited number of interviews with key stakeholders during the site visit which confirmed the general consent of local stakeholders with the implementation of the project activity.

The stakeholder consultation process has been found to be adequate and follow the local practices.

3.10. Additional Findings

None

4. Conclusion and Validation Opinion

Project Title	Methane Emission Utilization for Power Generation from Ethanol wastewater treatment at PT. Indonesia Ethanol, Lampung province, Indonesia
Basis of validation	ERM CVS based its validation work on: • CDM approved monitoring methodology ACM0014, version 3.1: "Mitigation of greenhouse gas emissions from treatment of industrial wastewater" • Project Design Document version 1 dated 01 April, 2010 and the revised PDD version 06 dated 22 July 2011 and the related investment analysis spreadsheets (version 4) and GHG emission reduction spreadsheet (version 4). • CDM Validation and Verification Manual (version 01.2) • ERM CVS's internal CDM validation methodologies and protocols • CDM decisions and guidance issued by the CDM Executive Board • UNFCCC criteria for the Clean Development Mechanism • Host Country criteria for the Clean Development Mechanism
Responsibilities of M CVS	ERM CVS is responsible to provide a thorough independent third party assessment of the proposed CDM project activity to ensure that the proposed CDM project activity meets all the identified and applicable criteria for registration of projects under the CDM.
Responsibilities of oject Participants	PT Indonesia Ethanol Industry, PT Biogas Energy Indonesia and ISCCP Investment Platform Limited are responsible for preparing the PDD, supporting documentation and providing all necessary evidences to support the information included in the PDD.
Activities performed	ERM CVS conducted its activities in accordance with the CDM Validation and Verification Manual, (version 01.2). The validation consisted of a review of project documentation, a site visit, and interviews with relevant personnel, cross checking and ascertaining information through other reliable sources and on its sectoral, regional and local expertise and resolution of CLs and CARs pertaining to the project activity.
ERM CVS Conclusion	ERM Certification and Verification Services has performed the validation of the project: Methane Emission Utilization for Power Generation from Ethanol wastewater treatment at PT. Indonesia Ethanol, Lampung province, Indonesia against the criteria for the Clean Development Mechanism as set out by the Conference of the Parties and the UNFCCC CDM Executive Board, and host country criteria. The validation employed standard auditing techniques, and a validation protocol checklist was used to carry out the validation. The project is a methane recovery from a waste water treatment facility (Cigar) project with utilization of the methane for power generation. The Annex 1 Party for the project activity is the United Kingdom. The Party fulfils the criteria for participation in the CDM, and has issued a letter of approval for the project and authorised the Project Participants. The LoA of the host Party, Republic of Indonesia confirms the contribution of the project towards sustainable development. The validation has provided sufficient evidence to demonstrate that the project activity is not the baseline scenario, and that emission reductions would be additional to what would have taken place in the absence of the CDM project activity. The project meets the applicability criteria and correctly applies the approved methodology ACM0014, version 3.1: "Mitigation of greenhouse gas emissions from treatment of industrial wastewater" and is therefore expected to result in real, measurable and long term reductions in greenhouse gas emissions. The monitoring plan provides for the collection and archiving of data sufficient to ensure that emission reductions can be verified. Nothing came to our attention to suggest that the project, if implemented as described, would not result in emission reductions of 69,578 tCO2e per year on average over the crediting period. It is the opinion of ERM CVS that the "Methane Emission Utilization for Power Generation from Ethanol wastewater treatment at PT. Indonesia Ethanol, Lampung province, Indonesia" as described in the PDD version 06, 22 July 2011 meets all stated criteria of the CDM, correctly applies the methodology ACM0014, version 3.1: "Mitigation of greenhouse gas emissions from treatment of industrial wastewater" and is expected to result in real, measurable and long term emission reductions, and the DNA of the host Party has confirmed that the project assists in meeting sustainable development criteria. ERM CVS therefore requests registration of the project activity.
Signed on behalf of ERM CVS	
Name:	Melanie Eddis
Date:	08 August 2011

Appendix A: Documents

Document Number	Title	Date (if applicable)
DR 1	Project Design Document, Methane Emission Utilization for Power Generation from Ethanol wastewater treatment at PT. Indonesia Ethanol, Lampung province, Indonesia. Version 01 GSP-PDD Version 02 Submitted to DOE as response to validation findings Version 03 Submitted to DOE as response to additional validation findings Version 04 Final version of the PDD submitted to DOE Version 05 Revised final version of PDD (minor edits in the monitoring section of the PDD) Version 06 Revised after Request for Review	 01 April 2010 10 August 2010 18 October 2010 25 November 2010 06 April 2011 22 July 2011
DR 2	Spreadsheet for project investment analysis. Version 01 Version 02 Version 03 Version 04 (after Request for Review)	 01 April 2010 10 August 2010 18 October 2010 22 July 2011
DR 3	Emission Reduction calculations spreadsheet, First year Emission Reduction calculations spreadsheet, Second – Tenth year Version 01 Version 02 Version 03 Version 04 (after Request for Review)	 01 April 2010 10 August 2010 18 October 2010 22 July 2011
DR 4	Guidelines for completing the project design document (CDM-PDD) and the proposed new baseline and monitoring methodologies (CDM-NM) (version 07).	
DR 5	Approved consolidated baseline and monitoring methodology ACM0014 “Mitigation of greenhouse gas emissions from treatment of industrial wastewater, Version 03.1	
DR 6	Tool for the demonstration and assessment of additionality, version 5.2	
DR 7	Tool to determine project emissions from flaring gases containing methane (Version 01)	
DR 8	Tool to calculate the emission factor for an electricity system (Version 02)	
DR 9	Tool to calculate baseline, project and /or leakage emission from electricity consumption (Version 01)	
DR 10	Tool to calculate project or leakage CO2 emissions from fossil fuel combustion (Version 02)	

Document Number	Title	Date (if applicable)
DR 11	Approved EIA (hard copy) EIA (AMDAL) report, (original) 2008	April 2009
DR 12	Notary Public of Indonesia Ethanol Industry (CONFIDENTIAL, company license of PT Biogas Energy Indonesia)	29 January 2007
DR 13	Deed of Incorporation_ PT.Biogas Energy Indonesia (CONFIDENTIAL, permission to do wastewater, biogas related projects)	11 January 2010
DR 14	Ethanol Factory EIA approval of Methane Emission Utilization for Power Generation from Ethanol wastewater treatment at PT. Indonesia Ethanol, Lampung province, Indonesia	08 May 2008
DR 15	Ethanol Plant layout	
DR 16	Technical specifications of Boiler	20 November 2009
DR 17	Technical specifications of Steam Turbine Generator Set	26 November 2008
DR 18	Aerobic Construction Cost quotation	
DR 19	Digester Construction Cost Quotation Digester Construction Cost Quotation	April 2009 June 2009
DR 20	Komnas MPB Grid Sumatera Jamali 2008 http://bisniskeuangan.kompas.com/read/2009/05/14/20362672/lampung.masih.alami.defisit.listrik	19 January 2009
DR 21	Indonesian Renewable Energy Development and Opportunity to implementation of CDM scheme (http://www.jst.go.jp/asts/asts_j/files/ppt/12_ppt.pdf)	
DR 22	Gas Negara distribution (http://pgn.co.id/eo_distr.htm)	
DR 23	Baseline Study Report Version 01 Version 02	December 2009 April 2010
DR 24	Feasibility study of ethanol plant, pages 2, 8,11,12 and 21	
DR 25	Aerobic Treatment Maintenance Cost Quotation	
DR 26	Digester Maintenance Cost Quotation	
DR 27	Digester Consultant Quotation (CONFIDENTIAL)	
DR 28	UNFCCC Notification for Methane Emission Utilization for Power Generation from Ethanol wastewater treatment at PT. Indonesia Ethanol, Lampung province, Indonesia.	19 April 2009
DR 29	Land Use Rights, PT Indonesia Ethanol Industry	23 July 2007

Document Number	Title	Date (if applicable)
DR 30	Host Party Letter of Approval issued by Indonesian National Committee	18 August 2010
DR 31	Annex 1 Letter of Approval issued by Department of Energy and Climate Change (UK)	29 October 2010
DR 32	Indonesia Bank Lending Rates (2004 – 2009)	
DR 33	Notice of Directors Meeting	13 January 2010
DR 34	Contract for supply of flaring system	16/17 September 2010
DR 35	Emission Reduction Purchase Agreement, ISCCP Investment Platform Limited and PT Biogas Energy Indonesia. Methane Emission Utilization for Power Generation from Ethanol wastewater treatment at PT. Indonesia Ethanol, Lampung province, Indonesia.	20 September 2010
DR 36	Coal price as published by supplier (2005-2008)	March 2009
DR 37	Coal price as published by supplier (2009)	October 2010
DR 38	Coal price as published by supplier (2010)	March 2010
DR 39	Coal cost Quotation	12 November 2010
DR 40	Emission Factor Calculations	18 October 2010
DR 41	Grid Emission Factor (Government Confirmation Letters)	24 December 2008 19 January 22009
DR 42	Stakeholder Meeting Template of Stakeholder Invitation Letter	
DR 43	Stakeholder Meeting Distribution List of Invitation Letter	
DR 44	Stakeholder Meeting Handout for Participants_Bahasa	
DR 45	Stakeholder Meeting Feedback from Participants	20 January 2009
DR 46	Stakeholder Meeting Consultation Report	20 January
DR 47	Stakeholder Meeting Attendance List	20 January
DR 48	GoldStandard Local Stakeholder Consultation Report	July 2009
DR 49	GoldStandard Passport: “Methane Emission Utilization for Power Generation from Ethanol wastewater treatment at PT. Indonesia Ethanol, Lampung province, Indonesia”	05 April 2009
DR 50	GoldStandard Confirmation of Passport Upload	06 April 2010
DR 51	GoldStandard Invitation to Local Stakeholder Meeting	12 January 2009
DR 52	Email Confirmation of Validity of Host Party LoA for Emission Utilization for Power Generation from Ethanol wastewater treatment at PT. Indonesia Ethanol, Lampung province, Indonesia	25 March 2011
DR 53	Designated National Authority for the CDM (UK DNA): List of Projects with UK Approval of Participation http://www.decc.gov.uk/en/content/cms/what_we_do/change_energy/tackling_clima/intl_strat/mechanisms/clean_developm/clean_developm.aspx	
DR 54	Contract for Engineering Services, PT Biogas Energy Indonesia and Waste Solutions a Division of CPG New Zealand Ltd. (including Memorandum of Agreement between Client and Project Manager)	21 April 2010

Document Number	Title	Date (if applicable)
DR 55	Waste Water Treatment, Aerobic Treatment (Project) Layout, Pt Indonesia Ethanol Industry (Flow Diagram Process) and Area Required for Digester (Site Plan) Schedule 8	
DR 56	Contract for Anaerobic In-Ground Digester - Earth Works, PT Biogas Energy Indonesia	21 May 2010
DR 57	Contract Variations, PT Biogas Energy Indonesia, Indonesia Ethanol Biogas Project Variation 01 Variation 02 Variation 03 Variation 04	 25 May 2010 11 August 2010 07 October 2010 23 September 2010
DR 58	Agreement for Installation of Breather Pipe Agreement for Supply of Valves Agreement for Installation of Piping Agreement for Installation of Cooling System Agreement for Installation of Geo-membrane Agreement for Installation of Pumps and Accessories Agreement for Installation of Electrical System Agreement for Supply of Instruments and Accessories for Electrical and Instrumentation System Agreement for Installation of Waste Hot Water Piping Agreement for the supply and construction of civil works	26 July 2010 21 September 2010 21 September 2010 21 September 2010 21 September 2010 25 September 2010 07 October 2010 07 October 2010 11 October 2010 26 October 2010
DR 59	Quotation for UFGB-2750 Containerised Duty/Standby Gas Plant, UF10-400 High Temperature Landfill Gas Flare and UFO-3360 Open Flare for Indonesia Ethanol Biogas Project Quotation for UFGB-2750 Containerised Duty/Standby Gas Plant, UF10-400 High Temperature Landfill Gas Flare and UFO-3360 Open Flare for Indonesia Ethanol Biogas Project	27 October 2010 29 October 2010
DR 60	Contract for supply of HDPE Geomembrane	07 September 2010
DR 61	UNFCCC notification – change to Project Participant and project start date	23 April 2010
DR 62	CDM Notification to Indonesian DNA	03 April 2009
DR 63	Build Operate and Transfer Agreement for a Methane Abatement and Heat Generation Project. PT Indonesia Ethanol Industry (Project Owner) and PT Biogas Energy Indonesia (Project Developer),	12 February 2010
DR 64	ERM CVS Work Assignment Contract. Signed.	02 April 2010
DR 65	Stakeholder Meeting Newspaper Invitation	13 January 2009
DR 66	Wastewater treatment at Indolampung 1	
DR 67	Wastewater treatment at Indolampung 2	

Document Number	Title	Date (if applicable)
DR 68	Wastewater treatment at PT.Molindo	
DR 69	Temperature data for 2007	
DR 70	Temperature data for 2008	
DR 71	Annual Average temperature	
DR 72	Technical review by independent Indonesian waste water treatment specialist, Professor Tjandra Setiadi, April 2010	
DR 73	Technical review by independent Indonesian waste water treatment specialist, revised and questions answered; Professor Tjandra Setiadi, June 2010	
DR 74	Cost analysis of waste water treatment plant construction; Professor Tjandra Setiadi	April 2010
DR 75	Footnote 7 in PDD: http://www.bi.go.id/biweb/Html/SekiTxt/T3x230.txt	
DR 76	2006 IPCC Guidelines for National Greenhouse Gas Inventories	
DR 77	Wastewater Technology Fact Sheet (EPA) (http://www.epa.gov/owm/septic/pubs/alagoons.pdf)	
DR 78	Appendix B XI – Keputusan Menteri Negara Lingkungan Hidup No 51-1995 (Wastewater standard for industrial activities in Indonesia)	
DR 79	Warranty Letter from GSE Lining Technology (Warranty life time of HDPE membrane)	
DR 80	Soil Test result (Ground water table depth)	
DR 81	Evidence for foot note 11 in PDD	
DR 82	Evidence for footnote 14 in PDD	
DR 83	Technical Specification of Flare	
DR 84	NCV of methane; Book title: Biogas Technology; Author: B. T. Nijaguna; Publisher: New Age International, 2002	
DR 85	ADB report on gas pipeline project (http://www.adb.org/documents/rrps/ino/39928-ino-rrp.pdf)	
DR 86	Spreadsheets showing detail and calculations of baseline lagoon options	
DR 87	Land preparation cost	
DR 88	Electricity cost, baseline calculations	
DR 89	Design Parameter Document_page 2 para 1_confident	
DR 90	Wastewater Characteristic Comparison	
DR 91	Boiler Specification (second)	
DR 92	PT Bukit Asam Annual Report	
DR 93	IBM Power Generation Equipment	
DR 94	Gas burner Cost quotation	
DR 95	Ethanol Factory Design Specifications	16 February 2010
DR 96	Economic Assessment of Baseline Alternatives (Spreadsheet)	

Document Number	Title	Date (if applicable)
DR 97	CDM Prior Consideration Application for PT Medco Ethanol Lampung wastewater treatment and biogas utilization project	01 November 2010
DR 98	Source of public information for electricity http://www.bpk.go.id/web/?page_id=917	
DR 99	Supplier invoice for caustic soda supply	April 2011
DR 100	Cost Quotations for equipments: - Cost information for concrete (http://indonetwork.co.id/readymix-beton/2709004/harga-ready-mix-concrete-beton-jadi-indonesia.htm) - Cost information for the price of steel (http://www.asiaconst.com/past_conference/conference/15th/3Indonesia.pdf) - Cost information for the price of plywood (http://www.anekamaju.com/53-triplek) - Cost quotation for feed pump by Shin Maya - Cost quotation for Mixer by Tritima - Cost quotation for PH monitor by Prominent - Cost quotation for electrical Panel by Jaya Parada	

Appendix B: CDM Validation Protocol Checklist

DR = Document Review (refers to number on Document List)

SV = Site Visit

IV = Interview (refers to number on List of Interviewees)

OK = acceptable

CAR = Corrective Action Request

CL = Clarification Request

FAR = Forward Action Request

NA = Not Applicable

	Checklist Question	Reference	Comment (based on the GSP-PDD, version 01)	Draft Conclusion	Final Conclusion
1.	**PDD Format**			**OK/CAR/CL**	**OK**
1.1	Is the PDD prepared in accordance with the latest template and guidance by the CDM EB? http://cdm.unfccc.int/Reference/PDDs_FORMS/PDDs/index.html	DR1	Yes, PDD is prepared in accordance with the latest template and guidance	OK	☑
1.2	Does the language make sense and is it clear?	DR1	Yes, the language is clear and makes sense	OK	☑
2.	**Project Title**	**PDD A.1**			
2.1	Does the project title enable the identification of the unique CDM project activity?	DR1	Yes, the title is "Methane Emission Utilization for Power Generation from Ethanol wastewater treatment at PT. Indonesia Ethanol, Lampung province, Indonesia"	OK	☑
2.2	Is the version number and date of the PDD clearly indicated? Is this consistent with the project's timeline?	DR1	Yes, it is clearly indicated the PDD version 01, which was completed in 01/04/2010. However, a timeline is not included in section B.5, as required by the "Guidelines for completing the project design document"	CL 1	

	Checklist Question	Reference	Comment (based on the GSP-PDD, version 01)	Draft Conclusion	Final Conclusion
			(PDD_guid04_v07), given that the starting date of the project activity is before the date of validation. CL 1: Include a project timeline indicating the different project implementation milestones in section B.5 of the PDD.		
3.	**Project Description**	**PDD A.2**			
3.1	Does the PDD contain a clear description of the project activity, with regard to its nature and technical implementation? Does Section A2 include: a. A brief summary of A4, particularly A4.3, b. A summary of B.3, sources and gases c. The PP's opinion regarding the contribution of the project to sustainable development	DR1	Yes, section A.2 contains a summarized description of the proposed technology of the project. However: a. Although the wastewater technology is briefly described, section A.2 fails in providing a clear understanding of the baseline scenario and if it coincides with the existing one, as requested by the PDD_guid04_v07; CL 2: Provide in section A.2 a clear description of the purpose of the project activity with a concise description of the existing, project and baseline scenarios. b. Gases that will be reduced are presented and it is clear that CO2 emissions will be reduced by the replacement of coal by biogas from the project wastewater to generate electricity; nevertheless, the section lacks in the explanation on the source(s) of CH4 emissions and how they will be reduced by the project activity; CL 3: Include in A.2 an explanation on how the proposed project activity reduces CH4 emissions making reference to the scenarios, emission sources and gases. c. Yes, sustainable development contributions are listed.	CL 2 CL 3	☑
3.2	Does the description deliver a transparent overview of the project activity and does it cover all relevant elements?	DR1 SV	Yes, A.2 transparently describes the proposed project activity, however, further clarity on the Greenfield nature of the involved facilities and the different scenarios (existing, project and baseline) need to be included. Refer to CL 2 and CL 3	CL 2 CL 3	☑

	Checklist Question	Reference	Comment (based on the GSP-PDD, version 01)	Draft Conclusion	Final Conclusion
3.3	Has a physical site inspection been undertaken to confirm that the description in the PDD reflects the proposed CDM project activity?	DR1 SV	Yes, a site visit was undertaken on 08 April 2010 and this confirmed the proposed project activity, its location and the description in the PDD. The ethanol plant was under construction, but the project wastewater treatment plant and the methane recovery facilities did not have their construction started, not allowing this DOE to inspect the project activity facilities or equipment.	OK	☑
3.4	Does section A.2 also indicate the baseline situation, and the historical situation at the facility, if this is different to the baseline? If the proposed CDM activity involves the alteration of an existing installation or process, does the description clearly state the differences to the pre-project situation?	DR1 SV	No, baseline and existing scenarios for the wastewater treatment are not clear. Refer to CL 2.	CL 2	☑
3.5	Is all information provided in the project description consistent with information provided in later sections of the PDD?	DR1	Yes, the information is consistent	OK	☑
4.	**Technical Description**	**PDD A.4**			
	Location of Project	**PDD A.4.1**			
4.1	Does the information provided on the location of the project activity allow for a clear identification of the site(s)? How was the site location confirmed? (e.g. site visit, planning documents)	DR1 SV	Yes, maps are presented in the PDD and coordinates are given. The site location was confirmed during the site visit	OK	☑
	Category/ Sectoral Scope	**PDD A.4.2**			
4.2	Is the category (sectoral scope) of the project activity indicated and correct?	DR1	The sectoral scopes of the project are correctly indicated as: - 13: waste handling and disposal and - 1: energy industries (renewable/ non-renewable)	OK	☑
	Technology to be Employed by the Project Activity	**PDD A.4.3**			
4.3	Is there a clear description of the baseline scenario, as identified in	DR1 DR23	No, the description of the baseline scenario is very brief and does not offer a clear understanding of the emission sources, GHG involved,	CL 4	☑

	Checklist Question	Reference	Comment (based on the GSP-PDD, version 01)	Draft Conclusion	Final Conclusion
	section B.4? This should include: a. An indicative list of the equipment(s) and systems that would have been in place in the absence of the project activity (if any) b. Information about the age and average lifetime of the baseline facility based on manufacturer's specifications and industry standards (if applicable) c. Installed capacities, load factors and efficiencies of the baseline facility (if applicable) d. An explanation of how the same types and levels of services provided by the project activity would have been provided in the baseline scenario.	DR24	mass and energy flows and balances of the systems and equipments, as required by the PDD_guid04_v07 and VVM. Potential sources of GHG emissions from the baseline scenario are just cited in A.4.3, which does NOT clearly associate potential BASELINE emissions to the system, which should have been better described in this section. There is a reference to table B.3-1 for further description, but the table could not be found in the PDD. Assuming table B.3-1 is related to table 6, in section B.3, it is important to note that section B.3 requires a table with emission sources and gases that are included in the project boundary with the purpose of calculating project and baseline emissions, while A.4.3 requires the identification of emissions based on the description of the system (baseline scenario, as identified in section B.4 (WW treatment in open anaerobic lagoons and power and heat generation by fossil fuel captive plants) and its parts. a. The PDD does NOT present the list of equipment(s) and systems that would have been in place in the absence of the project activity; however, Figure 2, presented in B.4.3, shows how some systems/equipment would be arranged in the baseline scenario. b. Information about the age and average lifetime of the baseline facility is NOT included. c. The section does NOT bring any information regarding installed capacity, load factors or efficiency in the baseline scenario, nor for the wastewater treatment or the power/heat supply. [As a remark for PPs, each component of the WW treatment system has an effect on the COD content of the WW. The project should affect only the open anaerobic lagoons. Therefore, information should be supplied in the PDD on the expected reduction of the WW COD content in each system/equipment in the baseline scenario (including the pre-treatment with rotary drum screen and the additional solid separation through sedimentation) and which part of the system would be impacted by the project activity, bearing in mind that methane would be emitted from the COD content treated in anaerobic lagoons of the baseline scenario, not from the total COD content of the wastewater coming from the plant. COD mass flow and balance are necessary and should be provided]. d. It is NOT explained how the baseline scenario would provide the same types and levels of service provided in the project scenario (wastewater treatment and power and heat supply).	CAR 1	

	Checklist Question	Reference	Comment (based on the GSP-PDD, version 01)	Draft Conclusion	Final Conclusion
			CL 4: include in section A.4.3 a more complete description of the baseline scenario, including all elements required by the PDD_guid04_v07; CAR 1: Correct or exclude reference to table B.3-1		
4.4	If the scenario existing prior to the start of the implementation of the project activity is different from the selected baseline scenario, is there a clear description of the pre-existing scenario, with a list of the equipment(s) and systems in operation at that time?	DR SV	The scenario existing before the implementation of the project is different from the selected baseline, as this is a Greenfield project. However, the PDD does not present this information clearly stated in A.4.3. CL 5: Include clear information on the existing scenario.	CL 5	☑
4.5	Is the technology to be employed by the project activity clearly described and is it consistent with information provided elsewhere in the PDD? The description should include: a. List of main technologies involved b. List of main equipment and installations c. The lifetime of the project equipment d. Capacities, load factors and efficiencies (where relevant) e. The emissions sources and the greenhouse gases involved in the project activity f. Existing and forecast energy and mass flows and balances g. Interaction with processes/equipment outside the project boundary, if any, is stated.	DR IV DR16 DR17 DR19 DR20 DR21 DR26 DR27 DR38	The technology is briefly described, but there are inconsistencies against the information provided in other parts of the PDD or in the supplied evidences, particularly regarding the cogeneration plant, which is considerably unclear. It has been noticed that: 1) the power capacity of the power plant is said to be 1.8 MW in A.2 and 3 MW in other parts of the PDD, while, according to the information obtained with PPs, the power capacity has been, in fact, reduced from 3 to 1.8 MW; 2) according to the technical specifications and the information in the PDD, the steam turbine needs 42 t/h of steam @ 435 ºC and 34 Bar (3.43 MPa) to run a 3 MW generator, while the related boiler technical specifications indicate it can supply only 25 t/h of steam @ 450ºC and 39 Bar (3.8 MPa), which seems to be inconsistent. The descriptions are not sufficient to demonstrate how technology applied is environmentally safe. And what know-how is to be used and how it is transferred to the Host Party(ies), as required by the PDD_guid04_v07. a. A list of the main equipment and installations is included, basically focused on the wastewater treatment plant. For the cogeneration equipment, information on its technical specifications is not sufficient. b. Information on monitoring equipments and their location is not provided.	CAR 1 CL 6 CL 7	☑

	Checklist Question	Reference	Comment (based on the GSP-PDD, version 01)	Draft Conclusion	Final Conclusion
			c. Lifetime information of the project equipment has NOT been included. d. No information on capacities, load factors and efficiencies have been provided for the main equipment of the project scenario. e. Potential sources of GHG emissions from the project scenario are just cited in A.4.3, which does NOT clearly associate potential project emissions to the described system. There is a reference to table B.3-1 for further description, but the table could not be found in the PDD. Assuming that table B.3-1 is related to table 6, in section B.3, it is important to note that section B.3 requires a table with emission sources and gases that are included in the project boundary for the purpose of calculating project and baseline emissions. Refer to CAR 1. f. No information on forecast energy and mass flows and balances is provided. g. Description on how the project interacts with processes/equipment outside the project boundary is NOT provided. CL 6: A more detailed description of the project scenario, including all elements required by the PDD_guid04_v07 should be provided; CL 7: Clarification on the cogeneration plant composition (boiler, steam turbine and generator) and technical specifications is required, including, but not limited to, information on power capacity, steam production capacity, rated working pressure, power and heat generation/consumption, etc. PPs are required to provide evidences, such as the design details of the project relating to the integrated cogeneration unit in order to substantiate the information supplied in the PDD and the assumptions used for the investment analysis and the ER calculations.		
4.6	Does the description of the technology to be applied provide sufficient and transparent input/ information to evaluate its impact on the greenhouse	DR1 DR27	No. Description of the technology and information on GHG emissions, energy usage and flow is not adequate to evaluate the impact on the GHG balance with the implementation of the project activity. Refer to CL 4 and CL 6	CL 4 CL 6	☑

	Checklist Question	Reference	Comment (based on the GSP-PDD, version 01)	Draft Conclusion	Final Conclusion
	gas balance?				
4.7	Does the implementation of the project activity require any technology transfer from annex-I-countries to the host country(ies)?	DR1 DR27 IV	A.4.3. does not describe the origin of the proposed technology, although, according to A.2, the CIGAR technology is to be provided from "developed countries". Refer to CL 6.	CL 6	☑
4.8	Does the project use state of the art technology and / or does the technology result in a significantly better performance than any commonly used technologies in the host country? Is the technology implemented by the project activity environmentally safe?	DR1 DR12 DR27	No such claim has been made in the PDD, but ERM CVS, based on its knowledge, confirms that generally the proposed covered anaerobic digester technology (CIGAR) results in a better wastewater treatment performance than the commonly used open lagoons, especially regarding the CH4 emissions, since the project includes the capability of capturing and burning CH4, which is not possible with open anaerobic lagoons. PPs are requested to improve the description of the baseline and project scenarios with particular reference to the use of this specific technology in the project activity. (See CL 4 and CL 6). An Environmental Impact Assessment (EIA) has been undertaken which has been approved by the local authorities. The technology proposed by the project activity is shown not to present additional environmental hazards beyond those associated with described in the baseline scenario.	CL4 CL6	☑
4.9	Is the project technology likely to be substituted by other or more efficient technologies within the project period?	DR1 DR27 IV	No, it is unlikely that the project technology will be replaced by other or more efficient solution within the project period, as the proposed technology is engineered with modern technology (refer to item 4.8).	OK	☑
4.10	Does the project require extensive initial training and maintenance efforts in order to be carried out as scheduled during the project period? Is information available on the demand and requirements for training and maintenance?	DR1 DR27 IV	The PDD indicates that the project will require training of local staff and also some maintenance efforts. This DOE could also confirm, according to the contract with the digester consultant, presented to the DOE during the site visit, that this consultant (from New Zealand) will be involved in (part of) the maintenance. Nevertheless, there is no further information regarding demands and requirements for training and maintenance. CL 8: provide clearer information on the demand and requirements for training and maintenance requirements of the proposed project activity.	CL 8	☑

	Checklist Question	Reference	Comment (based on the GSP-PDD, version 01)	Draft Conclusion	Final Conclusion
4.11	Is a schedule available for the implementation of the project and are there any risks for delays?	DR1	Cl 1	CL 1	☑
	Public Funding from Annex I country	**PDD A.4.5**			
4.12	Is the information provided on public funding provided in compliance with the actual or planned situation, based on the available evidence?	DR1 IV	There is no involvement of public funding from Annex 1 countries, but evidences regarding the actual project funding have not been presented. CL 9: Provide evidences regarding the source(s) of funding to the project activity to demonstrate that there is no public funding involved in the project activity.	CL 9	☑
4.13	If the project involves public funding from an Annex 1 country, have the annex 1 parties involved provided an affirmation that such funding does not result in a diversion of official development assistance?	DR1	N/A	N/A	NA
5.	**Approval and Participation**	**PDD A.3**			
5.1	Are project participants listed in tabular form in section A.3 of the PDD? Is this information consistent with the contact details provided in Annex 1 of the PDD and other project documentation (Letters of Approval and Modalities of Communication)?	DR1	Yes, all three participants are listed in section A.3 and are consistent with Annex 1: - PT Indonesia Ethanol Industry - PT Biogas Energy Industry - ISCCP Investment Platform Limited	OK	☑
5.2	Has the Host Party provided a Letter of Approval (LoA) with clear referencing and supporting documentation? Does the LoA confirm: ○ Ratification of the Kyoto Protocol ○ Voluntary Participation ○ Contribution to Sustainable Development ○ Reference to the precise project		The LoA from the Host Party has not been provided yet. CAR 2: Provide LoA issued by the Host Party.	CAR 2	☑

	Checklist Question	Reference	Comment (based on the GSP-PDD, version 01)	Draft Conclusion	Final Conclusion
	title in the PDD				
5.3	Was the LoA received directly from the DNA or from the project participants? Has the Host Party LoA been issued by the respective DNA? How has this been confirmed?		The LoA from the Host Party has not been provided yet. Refer to CAR 2.	CAR 2	☑
5.4	Has the Annex I Party provided a Letter of Approval (LoA) with clear referencing and supporting documentation? Does the LoA confirm: a. Ratification of the Kyoto Protocol b. Voluntary Participation c. Contribution to Sustainable Development d. Reference to the precise project title in the PDD		The LoA from the Annex 1 country has not been provided yet. CAR 3: provide LoA issued by Annex 1 country.	CAR 3	☑
5.5	Was the LoA received directly from the DNA or from the project participants? Has the Annex I Party LoA been issued by the respective DNA? How has this been confirmed?		The LoA from the Annex 1 country has not been provided yet. Refer to CAR 3.	CAR 3	☑
5.6	If either LoA contains additional specification or conditions of the project activity, then has the request for registration been based on the documents specified in the LoA?		Pending CAR 2 and CAR 3	CAR 2 CAR 3	☑
5.7	If the LoA references a specific version of the Validation Report or PDD and this version cannot be submitted, then has either of the following been submitted? a) a statement indicating final LoA has not been received, or b) an updated Validation Report/ PDD		Pending CAR 2 and CAR 3	CAR 2 CAR 3	☑

	Checklist Question	Reference	Comment (based on the GSP-PDD, version 01)	Draft Conclusion	Final Conclusion
6.	**Baseline and Monitoring Methodology**	**PDD B**			
	Title and reference of the approved baseline and monitoring methodology?	**PDD B.1**			
6.1	Are the number, version and title of the methodology clearly and correctly stated? Is the version of the methodology valid at the time of validation submission?	DR1 DR6	Yes, the project applies the approved baseline and monitoring methodology ACM0014, "Mitigation of greenhouse gas emissions from treatment of industrial wastewater", version 3.1, which is valid from 27 Feb 09 onwards..	OK	☑
6.2	Are the Tools applicable to the methodology correctly referenced, including the correct version number(s) valid at the time of registration submission?	DR1 DR7 DR8 DR9 DR10 DR11	Yes, the following Tools are referenced and were up to date as per the methodology: - Tool for the demonstration and assessment of additionality (Version 05.2); - Tool to determine project emissions from flaring gases containing methane (Version 01); - Tool to calculate the emission factor for an electricity system (Version 02); - Tool to calculate baseline, project and/or leakage emission from electricity consumption (Version 01); - Tool to calculate project or leakage CO2 emissions from fossil fuel combustion (Version 02).	OK	☑
	Justification for the choice of methodology and why it is applicable	**PDD B.2**			
6.3	Have any sources of greenhouse gas emissions been identified by the DOE ,within the project boundary following project implementation, which are expected to contribute more than 1% of the overall expected average annual emissions reductions, and which are not addressed by the applied	DR1 DR6	No other greenhouse gas emission sources which are expected to contribute more than 1% of the overall expected average annual emissions which are not addressed in the applied methodology have been identified.	OK	☑

	Checklist Question	Reference	Comment (based on the GSP-PDD, version 01)	Draft Conclusion	Final Conclusion
	methodology?				
6.4	Is the methodology fully applicable to the proposed project? For each of the applicability criteria: a. Is the criterion discussed in the PDD? b. Is compliance provable? c. Is evidence provided in the PDD to prove applicability? d. Has compliance with the criterion been verified (by checking evidence provided, sector/ local knowledge etc)?	DR1 DR3 DR4 DR19 DR23 DR24 DR27 DR33 SV IV	Yes, the methodology is fully applicable to the proposed project. As per scenario 1 of the applied methodology, the project aims at reducing methane emissions from industrial wastewater treatment (cassava ethanol production). Section B.2 of the PDD explains how each applicability condition is met. 1. Applicability to Scenario 1 (baseline situation – the wastewater is not treated, but directed to open lagoons that have clearly anaerobic conditions; project activity – the wastewater is treated in a new anaerobic digester; the biogas extracted from the anaerobic digester is flared and / or used to generate electricity and / or heat; the residual from the anaerobic digester after treatment is directed to open lagoons or is treated under clearly aerobic conditions). a. Yes, criterion is discussed; b. Yes, it is provable that the project is compliant with the criterion; c. Yes, the information provided in the PDD is considered good evidence to prove applicability; d. Yes, compliance to the criterion has been verified, based on the site visit, project details and local and sectoral knowledge.. 2. The average depth of the open lagoons or sludge pits in the baseline scenario is at least 1m. a. Yes, criterion is discussed; b. Yes, it is provable that the project is compliant with the criterion; c. Yes, the information provided in the PDD is considered good evidence to prove applicability; however, the baseline scenario is not properly described in A.4.3; refer to CL 4. d. Yes, compliance to the criterion has been verified, based on evidences provided by PPs (Baseline Study Report) and local and sectoral knowledge. 3. Heat and electricity requirements per unit input of the water treatment facility remain largely unchanged in the baseline scenario and the project activity a. Yes, criterion is discussed, but not properly addressed; b. No, the PDD does not offer evidences to prove that the project is compliant with the criterion;	CL 4 CL 10	☑

	Checklist Question	Reference	Comment (based on the GSP-PDD, version 01)	Draft Conclusion	Final Conclusion
			c. No, the information provided in the PDD is considered insufficient to prove applicability; furthermore, the Emission Reduction calculations spreadsheet shows the electricity required by the project is to be 201 kW, but this data is not presented in the PDD; it is not explained why the load of 201 kW would no represent a "significant increase in electricity needs". d. No, since the information provided in the PDD does not allow this DOE to confirm the project's compliance to the criterion. CL 10: provide clear and objective evidences that the project meets the applicability condition "Heat and electricity requirements per unit input of the water treatment facility remain largely unchanged in the baseline scenario and the project activity". 4. Data requirements as laid out in this methodology are fulfilled a. Yes, criterion is discussed; b. Yes, it is provable that the project is compliant with the criterion; c. Yes, the information provided in the PDD is considered good evidence to prove applicability; d. Yes, compliance to the criterion has been verified, based on available information in the PDD and other sources. 5. The residence time of the organic matter in the open lagoon system should be at least 30 days a. Yes, criterion is discussed; b. Yes, it is provable that the project is compliant with the criterion; c. Yes, the information provided in the PDD is considered good evidence to prove applicability; HRT of the lagoons, as presented in table 8 of the PDD, is 38 days; however, the baseline scenario is not properly described in A.4.3; refer to CL 4. d. Yes, compliance to the criterion has been verified, based on the Baseline Design Report and local and sectoral knowledge. 6. Local regulations do not prevent discharge of wastewater in open lagoons. a. Yes, criterion is discussed; b. Yes, it is provable that the project is compliant with the criterion;		

	Checklist Question	Reference	Comment (based on the GSP-PDD, version 01)	Draft Conclusion	Final Conclusion
			c. Yes, the information provided in the PDD is considered good evidence to prove applicability; d. Yes, compliance to the criterion has been verified, based on the Environmental Minister Decree Number KEP-51/MENLH/10/1995, regarding Effluent Standard For Industrial Activities, local and sectoral knowledge and collected information during the site visit (neighbouring facility discharges wastewater to open lagoons). 7. The baseline scenario, for Scenario 1, should correspond to W1 for treatment of wastewater and E1/E2 for electricity generation. a. Yes, criterion is discussed; b. Yes, it is provable that the project is compliant with the criterion; c. Yes, the information provided in the PDD is considered good evidence to prove applicability; d. Yes, compliance to the criterion has been verified, based on available information in section B.4 of the PDD.		
6.5	Was there a request for clarification, revision or deviation made for the adopted methodology in relation to the proposed project activity? If so, were the correct procedures provided by the CDM EB followed?	DR1 IV	N/A, no such request was made in relation to the project activity	OK	☑
	Description of sources and gases included in the project boundary	**PDD B.3**			
6.6	Does the PDD correctly describe the project boundary, including the physical delineation of the proposed CDM project activity, in compliance with the requirements of the selected baseline methodology, and is this consistent with site observations and other documentation provided?	DR1 DR6 DR15 DR21	Yes, the PDD correctly describes the project boundary. The information has been confirmed through the site visit and the provided evidences	OK	☑
6.7	Baseline emissions: Have all sources and GHGs required by the methodology been included within the	DR1 DR6	Yes, all sources of GHG emissions required by the methodology are included within the project boundary. 1. WW treatment process	CAR 4	☑

	Checklist Question	Reference	Comment (based on the GSP-PDD, version 01)	Draft Conclusion	Final Conclusion
	project boundary? For each potential source: a. Are source(s) and gases discussed by the PDD? b. Is inclusion / exclusion justified? c. Is explanation/ justification sufficient? d. Is the inclusion/ exclusion consistent with the monitoring plan?		a. GHG are discussed; b. GHG are included or excluded as per the methodology; c. Explanations/justifications are in line with the methodology; d. Included sources are consistent with the monitoring plan. 2. Electricity generation a. GHG are discussed; b. GHG are included or excluded as per the methodology; c. Explanations/justifications are in line with the methodology; d. Included sources are consistent with the monitoring plan. 3. Thermal generation a. GHG are discussed; b. GHG are included or excluded as per the methodology; c. Explanations/justifications for the exclusion of CH4 and N2O are NOT in line with the methodology; d. Included sources are consistent with the monitoring plan. CAR 4: Please provide the justification/explanation why CH4 and N2O baseline emissions are excluded from the thermal energy generation component to make is aligned with ACM0014.		
6.8	Project emissions: Have all sources and GHGs required by the methodology been included within the project boundary? For each potential source: a. Are source(s) and gases discussed by the PDD? b. Is inclusion / exclusion justified? c. Is explanation/ justification sufficient? d. Is the inclusion/ exclusion consistent with the monitoring plan?	DR38	No, not all sources of GHG emissions required by the methodology are included within the project boundary. 1. WW treatment process a. GHG are discussed; b. N2O emissions are excluded, which is not in line with the methodology; c. The explanation for the exclusion of N2O is that “the project does not involve land application of sludge”; however, this assumption is inconsistent with the information presented in other parts of the PDD; d. Included sources are consistent with the monitoring plan. CL 11: Please provide the inclusion/exclusion of N2O emissions from	CAR 2 CL 11 CL 12 CL 13	☑

	Checklist Question	Reference	Comment (based on the GSP-PDD, version 01)	Draft Conclusion	Final Conclusion
			the WW treatment or present a clear justification/explanation for its exclusion. N2O emissions need to be included, according to the methodology. 2. On-site electricity use a. GHG are discussed; b. The inclusion of CO2 emissions is not correct, since electricity is generated with biogas from the WW treatment; c. Explanations/justifications are in line with the methodology, however, the inclusion/exclusion of CO2 emissions has to be readdressed by PPs; d. Included sources are consistent with the monitoring plan. CL 12: Please provide the inclusion/exclusion of CO2 emissions from the electricity use or present a clear rationale for its inclusion. 3. On-site fossil fuel consumption a. GHG are discussed; b. It is claimed in the PDD that no fossil fuel is to be consumed by the project activity, however, according to the Technical Specifications of the Flare, the ignition system of the flare will use propane; CL 13: include project CO2 emissions from the combustion of propane in the project boundary or justify/explain why it can be considered negligible. c. Pending on CL 13 d. Pending on CL 13		
6.9	For large scale projects, is a diagram given to illustrate the project boundary, including all the key equipment, systems and flows of mass and energy, as well as the emissions sources and	DR1 DR15	A diagram of the project boundary is provided (Figure 4), clearly indicating the project boundary, key equipment and systems. However, the diagram lacks in mass and energy flows (e.g., WW flow, COD in/out, power capacity of the cogeneration equipment, among others) and the monitoring variables.	CL 11 CL 12 CL 14 CL 15	☑

	Checklist Question	Reference	Comment (based on the GSP-PDD, version 01)	Draft Conclusion	Final Conclusion
	gases included in the project boundary?		Methane emissions from wastewater are not clear in the diagram. Emissions from N2O from sludge disposal and CO2 from energy generation have to be readdressed, depending on the conclusion of CL 11 and CL 12. CL 14: include flows of mass and energy and monitoring variables in the diagram. CL 15: the statement that emissions from land application of sludge are "expected zero but monitored" should be clarified since this is not consistent with the remainder of the PDD.		
	Description of how the baseline scenario is identified and description of the identified baseline scenario	**PDD B.4**			
6.10	Does the PDD clearly identify the baseline, a scenario that represents the anthropogenic emissions by sources of GHG that would occur in the absence of the proposed CDM project activity?	DR1	Yes, section B.4 of the PDD concludes with the identification of C1 as the baseline scenario, composed of alternatives W1, E1 and H1.	OK	☑
6.11	a. Have the procedures/ steps to identify the most reasonable baseline scenario, as required by the methodology and applicable tools, been documented clearly in the PDD? b. Are all feasible and credible alternatives identified, including but not limited to all the potential scenarios listed in the methodology? c. Are all considered alternatives assessed for consistency with (enforced) mandatory laws and regulations?	DR1 DR23 DR24 DR25 DR28 DR29 DR33 DR35 DR36 DR37 DR55 DR56 DR57	a. The four steps indicated by the methodology are clearly and correctly followed and documented in the PDD. Step 1: Identification of alternatives scenarios Wastewater treatment scenarios (W) are correctly identified, according to the methodology. Specifications of the W1 scenario (WW treatment in open lagoons) for Greenfield facilities is followed, as shown below: (a) Definition of several lagoon design options i. Lagoon depths of 4, 5 and 6 m have been assessed in the PDD, following the Baseline Study Report. This is considered to be reasonable given common practice in wastewater treatment, according to the opinion of the local sectoral expert. However, from the 5 potential WW treatment designs considered in the Baseline Study Report, the PDD discusses only 3 of them. Further, Option 1 and 2	CL 16 CL 17 CL 18 CL 19 CL 20 CL 21 CL 22 CAR 5 CAR 6 CAR 7 CAR 8 CAR 9 CAR 10 CAR 11	☑

	Checklist Question	Reference	Comment (based on the GSP-PDD, version 01)	Draft Conclusion	Final Conclusion
	d. Does the list of alternatives include the project activity undertaken without being registered as a CDM project? e. If alternatives are excluded: ▪ Is sufficient evidence/ justification provided to support every exclusion of alternatives? Is it reasonable? ▪ Is it shown that at least one credible and feasible alternative does not face a barrier? Is this reasonable? f. If Investment Analysis is used to exclude baseline alternatives, has it been correctly applied? Are assumptions and input values reasonable and sufficiently justified?	SV IV	of the comparison in the PDD include a lagoon with forced aeration after the anaerobic lagoons and are essentially different from Option 3 that includes a facultative lagoon after the anaerobic lagoons. According to ACM0014, variations are supposed to be applied to the lagoon design, not to the WW treatment as a whole, therefore the comparison is not acceptable. CL 16: provide clarification in the PDD on the reason why the 3 lagoon (WW treatment systems) design options were chosen. CAR 5: redo the comparison between different lagoon design options to define scenario W1, in order to meet the requirements of ACM0014, particularly regarding the limitation of the comparison to the open anaerobic lagoon part of the baseline WW treatment. ii. In the Indonesian expert's opinion, the anaerobic lagoon should be, at least, double the size of the proposed designs, since the 1st and 2nd anaerobic lagoons would work with organic loading rates (OLR) of 2.25 and 2.80 kg COD/m^3.day, respectively. These values are significantly higher than the normal OLR of anaerobic lagoons, which are usually designed for an OLR below 1 kg COD/m^3.day. It is also identified that the total hydraulic retention time (HRT) of the anaerobic lagoons considered in the Baseline Study Report is 36,000 m3, while table 8 in the PDD states 38 days. CL 17: provide technical explanation regarding the assumed organic loading rates and the hydraulic retention times of the anaerobic lagoon design options specifically with reference to the project activity. CL 18: adjust the HRT in table 8 or justify the reason for the use of a value in the PDD (38 days) different than the one used in the Baseline Study Report (36 days). (b) Economic assessment of the lagoon design options		

	Checklist Question	Reference	Comment (based on the GSP-PDD, version 01)	Draft Conclusion	Final Conclusion
			CAR 6: correct the sentence in the last paragraph of page 14 of the PDD; instead of "(…) from the options defined in step (a) (…)", it should be "(…) from the options defined in step 1 (…)". i. ACM0014 requires the least cost option, between the lagoon design options defined in item (a) of the steps to define the W1 scenario, to be chosen. PPs stated that "simple cost analysis is applied to identify the least cost lagoon design option", with the justification that open lagoons "do not generate any revenue". However, this statement is not correct, since this step is mandatory by the methodology and is not related to the "Tool for the demonstration and assessment of the additionality". CAR 7: revise the first paragraph of page 15 and readdress the approach to step (b) to define the W1 scenario. ii. The comparison between the lagoon design options should focus uniquely on the investment costs of the open lagoons affected by the project activity, i.e., the costs to implement the anaerobic lagoons (W1). The "financial assessment" used in step (b) to define the W1 scenario is irrelevant, containing information that do not belong to this comparison. Additionally, although unit costs can be found in the Baseline Study Report, evidences to substantiate the used values have not been supplied, cost calculations are not open to be validated and the analysis does not bring the key elements (e.g., excavation cost) in the PDD, which prevents the clear and transparent understanding of the cost composition of each option. CAR 8: Redo the economic assessment of the identified options, as required by step (b) to define the W1 scenario, limiting the analysis to the investment cost of the anaerobic lagoon design options and choosing the least cost option as the W1 scenario. Make sure all the key information for the cost composition of each option is clearly and		

	Checklist Question	Reference	Comment (based on the GSP-PDD, version 01)	Draft Conclusion	Final Conclusion
			transparently presented in the PDD. CL 19: provide evidences for the values used in the cost analysis of the lagoon design options (e.g., land price and excavation cost) and the whole calculation rationale or open spreadsheets. (c) Verify the average depth of the baseline lagoon design (literature review or survey) i. A literature survey was conducted for organic wastewater treatment (not specific to ethanol). Both sources are referenced and are valid – footnote 11 (DR 23) and footnote 12 (EPA). The referenced literature confirms that "depths approaching 6 m are recommended" and that lagoons "should be as deep as practical". In the case of the proposed project activity, the water table was identified 9 m below ground level, thus open anaerobic lagoons in the region can be considered as deep as or deeper than the identified W1 scenario. (OK) ii. A desk-based survey was also conducted. Only 3 other systems were considered comparable to the project. The survey was limited to include ethanol plants in Indonesia with similar production capacities and only one uses an open lagoon system to treat the wastewater. The document evidence provided is not detailed, but as the literature review was conclusive and since it is the primary requirement of the methodology, the limited survey has been accepted as sufficient. (OK) (d) This step has been skipped by PPs in the PDD, as the average depth of the lagoon design option identified in Step (b) is NOT deeper than the depth identified through literature review in Step (c). (OK) The conclusion is that the W1 scenario is option 3 (open lagoon with depth of 6 m), however the validation of this conclusion is pending on the resolution of CL 15 to CL 18 and CAR 5 to CAR 8. *** An independent Indonesian wastewater expert (Prof. Tjandra		

	Checklist Question	Reference	Comment (based on the GSP-PDD, version 01)	Draft Conclusion	Final Conclusion
			Setiadi, PhD) was contracted by ERM CVS to review and assess the identification of the wastewater treatment alternative scenarios. Alternatives for heat and electricity generation are identified, as required by the methodology, but the PDD brings a misplaced conclusion (last paragraph, page 16) that scenarios H1 and E1 are the most plausible scenarios. Such conclusion could only be reached in Step 4 of ACM0014. CAR 9: remove from Step 1 the conclusion that scenarios H1 and E1 are the most plausible scenarios, as scenarios H2, H3, E2 and E3 cannot be simply disregarded. There is also a statement in the first paragraph of page 17 that is not in line with the instructions provided in the methodology: "It can [be] considered that heat requirement aspect is already reflected in alternative E1. Hence only alternative E1 - Power generation using fossil fuels in a captive cogeneration power plant is considered in further steps". This statement is not correct, since this option is not offered by the methodology". CAR 10: The statement "It can [be] considered that heat requirement aspect is already reflected in alternative E1 is not in accordance with the methodology.. Hence only alternative E1 - Power generation using fossil fuels in a captive cogeneration power plant is considered in further steps". Step 1 concludes with alternatives indicated by the methodology. (OK) Step 2: Eliminated alternatives that are not in compliance with applicable laws and regulation Scenario W2 (direct release of wastewater to a nearby water body) is eliminated, based on an Indonesian regulation that imposes a maximum COD content of 300 mg/L for a wastewater to be		

	Checklist Question	Reference	Comment (based on the GSP-PDD, version 01)	Draft Conclusion	Final Conclusion
			discharged in a water body. The referenced evidence (DR 33) has been checked and the W2 scenario has been properly eliminated. (OK) Step 3: Eliminate alternatives that face prohibitive barriers Refer to items 7.33 to 7.40 (Barrier Analysis) for deeper evaluation of the approach used by PPs on this step. Scenario W3 (aerobic wastewater treatment facilities) has been eliminated on the basis that it faces technological barriers. Cited reference (footnote 14) to substantiate this claim has not been supplied and could not be found elsewhere. Additionally, it is stated for scenarios W4 and W5 that they "do not face any barrier", which is inconsistent with Step 3 Barrier Analysis in section B.5. CL 20: provide evidence referenced in footnote 14 of the PDD in order to substantiate the technological barrier suffered by scenario W3. Scenarios H1 and E1 are not properly analyzed. The availability of alternative fossil fuel has not been demonstrated based on evidences. Further, the comparison between diesel and coal fired power plants is based on the cost per KWh generated, which essentially consists in an economic comparison. As per the VVM, "Issues that have a clear direct impact on the financial returns of the project activity cannot be considered barriers and shall be assessed by investment analysis". CL 21: Provide evidences regarding the unavailability of natural gas and other fossil fuels for the project activity. CAR 11: either (1) remove from Step 3 the economic comparison between the power generation with diesel and coal for H1/E1 and keep the 2 options for further comparison in Step 4; or (2) provide evidences of a prohibitive barrier that would prevent H1/E1 scenarios from using diesel. Alternative scenarios E2, E3, H2 and H3 are said to have already been eliminated by the ethanol plant owner, however this		

	Checklist Question	Reference	Comment (based on the GSP-PDD, version 01)	Draft Conclusion	Final Conclusion
			explanation is purely anecdotal and does not consist in evidence by itself. Elimination of alternative scenarios can be made when they face prohibitive barriers, which have to be objectively justified and substantiated with evidences. CL 22: Provide evidences that support the elimination of alternative scenarios H2, H3, E2 and E3 in Step 3 of the identification of the baseline scenario. Step 4: Compare economic attractiveness of remaining alternatives The selection of alternatives for the economic attractiveness comparison in Step 4 has NOT been properly made, as Step 3 needs to be readdressed and revised, as per CL 21, CL 22 and CAR 11. Investment comparison has been made between 3 alternative scenarios, identified as C1, C2 and C3. As mentioned above, depending on the resolution of CL 21, CL 22 and CAR 11, more alternatives may need to be added to the comparison. The comparison of the economic attractiveness of the alternatives is not transparently presented in the PDD. Please refer to itens 7.13 to 7.32 for more details. b. No. Alternatives E2, E3, H2 and H3 are eliminated without sufficient justification, which leads to the conclusion that not all feasible and credible alternatives have been properly identified. Pending on CL 21, CL 22 and CAR 11. c. The identified alternatives are assessed for consistency with mandatory laws and regulations. Alternative W2 (direct release to a nearby water body), is correctly excluded as it is non-compliant with Indonesian regulations (OK). d. Yes, the list of alternatives does include the project activity undertaken without being registered as a CDM project. (OK) e. Alternatives H2, H3, E2 and E3 have been eliminated without		

	Checklist Question	Reference	Comment (based on the GSP-PDD, version 01)	Draft Conclusion	Final Conclusion
			proper justification. Refer to CL 21, CL 22 and CAR 11. More than one alternative face no barrier, according to the analysis made in the PDD. f. Investment analysis (Comparison Analysis) has been used, as required by Step 4 of the methodology, to identify the baseline scenario, which ends up eliminating scenarios. The financial indicator used in the comparison (NPV) is not fully in compliance with ACM0014, which requires the use of IRR. However as the alternatives with open anaerobic lagoons generate no revenue, PPs decided to use NPV as the financial indicator, as explained in the PDD. It is this DOE understanding that, according to the instructions of the "Tool for the demonstration and assessment of the additionality" and using ACM0010 as reference, the approach used by PPs is correct and acceptable to perform the attractiveness comparison between the identified alternative scenarios.		
6.12	Have all relevant national and/or sectoral policies and circumstances been taken into account? Are they listed in the PDD?	DR1 IV	Yes. The PDD refers to the "Environmental Minister Decree Number KEP-51/MENLH/10/1995 regarding Effluent Standard For Industrial Activities", which imposes a maximum COD content of 300 mg/L for a wastewater to be discharged in a water body. No other national and/or sectoral policies have been referred to and or listed in the PDD. According to ERM's local Indonesian office's regulatory team. Indonesia doesn't have specific regulations or policies on ethanol, wastewater, co-generation, coal use, CDM, renewable energy or Lampung region.	OK	☑
6.13	Does the PDD provide a verifiable description of the baseline scenario, including a description of the technology/ activities that would have been employed in the absence of the CDM project?	DR1 SV	Yes, the PDD does provide a description of the baseline scenario. More detailed clarification was requested in CL 4.	CL 4	☑
6.14	Does the identified baseline scenario reasonably represent what would occur in the absence of the proposed project activity?	DR1 DR55 DR56 DR57	Yes, the baseline scenario does reasonably represent what would occur in the absence of the project activity. Given the relative complexity and risk associated with the biogas system, it is reasonable to expect that the usual method of open lagoons would otherwise have been used. The depth of the baseline lagoons would reasonably be 4	OK	☑

	Checklist Question	Reference	Comment (based on the GSP-PDD, version 01)	Draft Conclusion	Final Conclusion
		SV IV	- 5 m according to the Indonesian waste water treatment specialist.		
7.	**Additionality**	**PDD B.5**			
	a) Prior consideration of the CDM	**PDD C.1.1**			
7.1	Is the start date defined in accordance with the "Glossary of CDM terms"? What evidence is provided to verify that this was the official start date? Is this considered reliable and reasonable?	DR1 IV	The start date of the project activity presented in Section C.1.1 of the PDD is 26 November 2008, related to signature of the work order for the steam turbine. However, as the steam turbine is not an equipment related to the project activity itself (wastewater facility), its purchasing event is not appropriate to determining the start date of the project activity. CAR 12: The start date of the project activity in section C.1.1 is not appropriate as the work order of the steam turbine is not part of the CDM project activity. A description of how this start date has been determined, and a description of the evidence available to support this start date should be provided.	CAR 12	☑
7.2	Is it a new project activity (start date on or after 2 August 2008) or an existing project?	DR1	It is not possible to determine if it is a new or existing project, since the start date of the project activity has not been properly indicated. Refer to CAR 12	CAR 12	☑
7.3	For a new project which does not require a new methodology and has not published its PDD for stakeholder comments prior to the start date, then: a. Have the project proponents informed the DNA and UNFCCC secretariat in writing? How has this notification been verified? (i.e. confirmation from the DNA or UNFCCC) b. Was the notification made within 6 months of the project activity start date? c. Does the letter/ notification indicate the precise geographic	DR1	a. Documents regarding the communication to the DNA and UNFCCC of the CDM prior consideration have not been supplied by PPs. However, the need for presenting this documentation depends on the resolution of CAR 12 b. Pending on CAR 12 c. Pending on CAR 12 d. Pending on CAR 12.	CAR 12	☑

	Checklist Question	Reference	Comment (based on the GSP-PDD, version 01)	Draft Conclusion	Final Conclusion
	location and provide a brief description of the proposed project? d. Have the project proponents informed the DNA and/ or UNFCCC secretariat of the progress of the project activity every subsequent two years after the initial notification?				
7.4	For an existing project which has a start date prior to the publication of the PDD for global stakeholder comments, has the project proponent provided the following: a. Evidence of awareness of the CDM prior to the project activity start date and that the benefits of the CDM were a decisive factor in the decision to proceed with the project? (e.g. Board minutes, notes etc) Is this sufficient? Reliable evidence that demonstrates real actions were taken to secure CDM status in parallel with the project's implementation? (e.g. contracts with consultants for CDM/PDD/methodology services, ERPAs, correspondence with CER buyers, DOEs, DNAs or the UNFCCC). Is this sufficient?		N/A – this is a new project	N/A	NA
	b) Identification of alternatives (Additionality Tool)	**PDD B.5**			
7.5	Is the assessment of alternatives in compliance with the requirements of the methodology and the relevant tool(s) (e.g. the Tool for the demonstration and assessment of	DR1 DR7	ACM0014 version 3.1 requires the identification of the baseline scenario following its steps, which overlap steps 1, 2 and 3 of the "Tool for the demonstration and assessment of additionality", which are developed in section B.4. Validation of the proper assessment of alternatives is pending on CL	OK	☑

	Checklist Question	Reference	Comment (based on the GSP-PDD, version 01)	Draft Conclusion	Final Conclusion
	additionality)? Is the assessment consistent with section B.4?		21, CL 22 and CAR 11. Please refer to items 6.10 to 6.14 of this report for more details.		
	c) Investment Analysis				
7.6	Has an investment analysis been used to demonstrate additionality? Is Investment analysis appropriate in this case to demonstrate the investment decision? (i.e. is financial attractiveness the key investment criteria?)	DR1 DR7	Yes, the additionality demonstration used the investment analysis. ACM0014 requires a step wise approach to identify the baseline scenario, which includes a barrier analysis (Step 3) and, if more than one alternative is not prevented by prohibitive barriers, which is the case of the project activity that remained with 3 alternatives, a comparison of the economic attractiveness (Step 4) of each alternative has to be made. Step 3 of ACM0014 overlaps with Step 3 of the "Tool for the demonstration and assessment of additionality", while Step 4 of the methodology coincides with Step 2 of the tool. The results of the comparison analysis (NPV of each alternative), in section B.4 of the PDD, were used as the basis for the investment analysis and additionality demonstration in B.5. Yes, this is a private sector investor and financial profitability is the key investment decision criteria	OK	☑
7.7	Has the project activity and investment decision been clearly defined/ framed? That is, has the CDM project activity been defined separately from the overarching project or facility and is the investment decision in this case clearly framed? (e.g. is the project to 'make cement' or is it to 'supply fuel to a cement factory'?)	DR1 DR13 DR14	Yes, the ethanol plant requires the treatment of wastewater to meet local regulations. The project activity comprises the wastewater treatment by using an anaerobic digester and capturing and utilizing the biogas for heat and power generation. The project activity has been designed separately from the ethanol plant. There are two project participants in this case: - the ethanol plant owner (PT Indonesia Ethanol Industry – IEI) - the Build Operate Transfer (BOT) contractor, Biogas Energy Indonesia – BEI This is not fully explained in the PDD. If the project activity would be separated, it is unnecessary for IEI to be a project participant. CL 23: : provide: more information about the structure and the arrangement between IEI and BEI, explaining the arrangement and agreement between these two parties. (e.g., how revenues from electricity and heat are distributed between BEI to IEI)	CL 23	☑

	Checklist Question	Reference	Comment (based on the GSP-PDD, version 01)	Draft Conclusion	Final Conclusion
			This affects the analysis and the framing of: - Who is the investor? and - What is their investment decision? However, as explained by the PPs, the project activity is considered as a whole and analysed as a single investment. The economic attractiveness or otherwise the investment can then be assessed regardless of any creative contractual arrangements between the two parties. (OK) Costs and revenues related to the wastewater treatment system and capture of biogas have been included.		
7.8	Has the appropriate analysis Option been chosen? (as per the Guidance on the Assessment of Investment Analysis) • If Option I is chosen (simple cost analysis), is it demonstrated that the alternatives produce no economic benefits other than CDM income? • If Option II is chosen (investment comparison), does the proposed baseline scenario leave the PP no other choice than to make an investment to supply the same and (or substitute) products or services? • If Option III is chosen, is it appropriate in this case?	DR1 DR2 DR7 IV	Option II, Investment Comparison, has been chosen. It is appropriate in this case as 'doing nothing' (making no investment) is not an alternative, as the facility is 'Greenfield' and some solution for wastewater treatment has to be implemented.	OK	☑
7.9	Is the most suitable financial indicator clearly identified (Project or Equity IRR, NPV, cost benefit ratio, or (levelized) unit cost)?	DR1 DR2 DR7 IV	NPV has been chosen as the financial indicator. This is suitable as the baseline scenario does not generate any revenue and because the investment is largely up-front while the benefits flow for years after.	OK	☑
7.10	If Option I is chosen:		N/A	N/A	NA

	Checklist Question	Reference	Comment (based on the GSP-PDD, version 01)	Draft Conclusion	Final Conclusion
	a. Are the assumptions consistent for all alternatives assessed? If not, are the differences justified?				
7.11	If Option II is chosen: a. Are the assumptions for all alternatives compared consistent (including discount rates if applicable)?	DR1 DR2 DR7 DR12 DR23 DR24 DR28 DR29 Dr33 DR35	Yes, - the amount of wastewater generated and treated will be the same for both alternatives - the investment cost of the generator and boiler is the same for both. An additional investment in a blower is required as part of the boiler equipment in the project activity and is included in the analysis - the operating costs of the boiler and generator are the same in both alternatives and thus not included in the investment comparison - The discount rate of 12.96% is the same for both alternatives	OK	☑
7.12	If Option III is chosen: Benchmark (BM) or Discount Rate (DR) a. If an IRR indicator is used, is the choice of BM type consistent with the type of IRR calculated? (e.g. a Project IRR benchmark is appropriated for a WACC or Project IRR analysis; an Equity IRR benchmark is appropriate for an Equity IRR analysis) b. Is the BM or DR value justified with supporting evidence for its appropriateness? c. Is an appropriate BM or DR value chosen that is relevant for the sector (i.e. electricity generation, cement manufacture, yeast manufacture, hydropower etc? d. Is an appropriate BM or DR		N/A	N/A	NA

	Checklist Question	Reference	Comment (based on the GSP-PDD, version 01)	Draft Conclusion	Final Conclusion
	value chosen that is relevant for the project activity (i.e. for this investor, country, risk of project, time of investment decision)? e. Is the chosen benchmark conservative and in line with other BM or DRs used in current or previous projects by the same investor? (including the BM or DR used in Feasibility Studies or other financial analyses of the project activity)				
	Source of BM or DR If an external BM or DR has been used: a. Is the BM or DR based on publicly available data sources? Have these data sources been validated? b. Are the assumptions underlying the referenced BM or DR also applicable to this project?	DR1 DR2 DR58	a. Yes, the DR is based on publicly available data from Bank Indonesia's website (footnote 7). b. The rate of 12.96% is the interest rate for commercial banks for investment loans in rupiah in May 2008. This seems relevant for this project and is applied equally to both alternatives. Once the CAR 5 in 7.1 was answered, it should be checked if May 2008 was the right time for this data used. Pending on CAR 12.	CAR 12	☑
	Source of BM or DR If an internal company BM or DR has been used: a. Is the project participant the only possible investor in the project? b. Is it sufficiently demonstrated that the internal benchmark has been used for similar projects with similar risk or would have been used for similar projects in the same sector and country/region? c. How has this been validated?		N/A	N/A	NA
	d. Has a lower BM or DR been used in previous investment decisions	DR1 DR24	d. CL 24: Provide evidence to support the appropriateness of the discount rate from commercial banks. What is the rate of interest	CL 24 CAR 12	☑

	Checklist Question	Reference	Comment (based on the GSP-PDD, version 01)	Draft Conclusion	Final Conclusion
	by the project participant (in this project or similar others)? If so, are there verifiable circumstances that have led to a change in the BM or DR? e. Is the chosen BM or DR value conservative in comparison with other comparable publicly available comparable BM and DRs? f.	DR58	currently paid by IEI on loans for the factory? Also, what was the DR/ BM used in the ethanol factory's FSR? e. The DR is based on the commercial banks lending rate in May 2008. This is a conservative average rate and is also the official rate from the Bank of Indonesia. The rate of 12.96% for commercial banks compares to 12.58% for the State Bank, 13.92% for Regional Government Banks, and 12.2% for Private National Banks. The rate of 12.96% was the lowest rate for all months in 2008 for investment loans from commercial banks so it is conservative. Once CAR 12 is solved, this needs to be checked. f.		
	Risk Premiums g. Are risk premiums applied in the development of the BM or DR? h. If so, are they reasonable and justified? How has this been validated?		N/A, no risk premiums are applied	N/A	NA
	Assumptions and Input Values				
7.13	Are all references made in the investment analysis correctly referenced/ sourced? Have these sources been verified?	DR1 DR24 DR58	The DR source is referenced and has been verified (see above) The FSR for the ethanol factory is also referenced as a source.	OK	☑
7.14	Have values from a feasibility study report (FSR) approved by national authorities been used? If so: a. Has the FSR been the basis of the decision to proceed with the investment in the project? How has this been verified? b. Are the values used in the PDD and associated annexes valid and consistent with the FSR? c. At the time of the investment decision, are the input values from the FSR valid and applicable (based on specific local and	DR1 DR16 DR17 DR21 DR22 DR23 DR24 DR27 DR31 DR32 SV	a. A FSR was prepared for the ethanol plant but no formal FSR was undertaken for the project activity. The values from the FSR for the plant were used to justify some production parameters. It was explained by the PP during site visit that there was a first version of FSR without the project activity and a second version with the project activity included b. Pending on the delivery of FSRs and whether or not final version of FSR was approved. c. Pending on the delivery of FSRs and whether or not final version of FSR was approved. CL 25: Provide previous version of the FSR as evidence to confirm input values used in the investment analysis, which were available by the time of the decision to invest in the project activity.	CL 25	☑

	Checklist Question	Reference	Comment (based on the GSP-PDD, version 01)	Draft Conclusion	Final Conclusion
	sectoral expertise and knowledge)?	IV			
7.15	Technical assumptions a. Are the technical assumptions reasonable? b. Are the assumptions adequately supported by evidence/ justification? c. What evidence has been provided to support critical technical assumptions? Have technical assumptions and input values been verified by: assessing them against the available evidence and expertise; cross-checking the parameters against 3rd party or publicly available sources; reviewing feasibility reports; reviewing information of other similar projects; reviewing project information presented in permit applications etc; referring to a sector or technical expert; etc?	DR1 DR2 DR16 DR17 DR21 DR22 DR23 DR27 DR30 DR31 DR32 IV	'Energy Cal' worksheet in Investment Comparison spreadsheet: a. PP reports that the original design of the cogeneration plant was based on a demand of 3 MW power capacity. This was later revised down to 1.8 MW, but turbine and generator had been already purchased. For a 1.8 MW power generation, the 25 t steam/h boiler seems to be oversized, as the need for 25 t steam/h that results in an overestimated coal use (31,500 t/yr) and steam per MWh. Refer to CL 7. CAR 13: Revise input data and assumptions related to the energy balance of the proposed cogeneration plant (and provide the proper explanations used in the "Investment Comparison Analysis" spreadsheet, presenting all calculations and the rationale in a transparent and traceable way and making sure all parameters are related to the final power generation (1.8 MW). Main parameters that need to be readdressed are: net calorific value of coal, coal consumption (per ton of steam and per year), boiler energy output, steam enthalpy (calculation), steam consumption and turbine energy output. b. Most of the assumptions and values used in the "Investment Comparison Analysis" spreadsheet are supported by proper evidences, except for: – Net calorific value of methane, cell D25 in the 'Energy Cal' worksheet, that is not consistent with the provided evidence (DR 30); – Land area required for project activity and baseline, cells D17 e D18 in the 'Basic Data' worksheet; "evidence 15" is referenced, but not consistent with evidence package' as provided to ERM CVS CL 26: provide proper supporting evidences for the NCV of methane (or adjust value) and required land area for project and baseline.	CL 7 CL 26 CAR 13	☑

	Checklist Question	Reference	Comment (based on the GSP-PDD, version 01)	Draft Conclusion	Final Conclusion
7.16	Financial Assumptions a. Are the revenue and price financial assumptions reasonable? b. Are the assumed costs reasonable? Do they all accrue to the CDM project activity only (rather than to other parts of the facility)? c. Are all the assumed taxes applicable for the different alternatives and applicable for the whole assessment period? d. Are the assumptions adequately supported by evidence/ justification? e. What evidence has been provided to support critical financial assumptions? Have the financial assumptions and input values been verified by checking them against feasibility studies, quotes, receipts, third-party forecasts, annual reports, and financial analyses (such as those presented to banks), etc?	DR1 DR2 DR3 DR4 DR18 DR19 DR23 DR25 DR26 DR27 DR28 DR29 DR31 DR32	a. Neither project nor baseline scenarios generate revenues, however the project activity results in cost savings due to the reduction in coal consumption, which is reflected in the "Investment Comparison Analysis" spreadsheet. The PDD is not clear regarding how assumptions are defined or their supporting evidences. Further, the referred spreadsheet does not present a comprehensive composition and breakdown of the main costs, such as equipment/systems, construction and O&M for the compared scenarios, as required by Step 4 of the baseline identification of ACM0014. Coal price assumptions, in the 'Basic Data' worksheet, present particular issues. This is discussed in sub-item (b) of this item. In D11, coal price has a value of US$ 525,000 per tonne, which is extremely high; it is later divided by 1,000,000 in the NPV worksheets. Reference is made to DR31 and DR32 to justify the assumed coal price. The reference is not an official document, nor is clear enough; therefore it cannot be accepted as a supporting evidence to substantiate the assumed coal price. CAR 14: Provide a proper supporting evidence for the coal price in cell D11, 'Basic Data', "Investment Comparison Analysis". b. Cost assumptions for capital investment and O&M are not transparently presented in the PDD or in the "Investment Comparison Analysis" spreadsheet, 'Basic Data' worksheet: D24, Capex in the project – breakdown is not properly shown and provided evidences (quotations) are not sufficiently clear to allow the understanding of the investment cost composition. D29, Capex in the baseline – breakdown is not shown in the PDD and evidence (Baseline Study Report) is not clear enough to allow the understanding of the investment cost composition. D35 and D39, baseline and project O&M costs – breakdown is not shown, not allowing the understanding on how O&M is calculated or estimated. CAR 15: Provide clear and transparent breakdown of capital investments and O&M costs for project and baseline scenarios in the	CAR 14 CAR 15	☑

	Checklist Question	Reference	Comment (based on the GSP-PDD, version 01)	Draft Conclusion	Final Conclusion
			"Investment Comparison Analysis" spreadsheet, supplying information in the PDD and proper supporting evidence. c. Taxes – income tax of 30% is assumed, but not applied (pre-tax analysis) – OK References are provided, but in many cases, the supplied references are not clear enough or not appropriate for the used assumptions. Refer to CAR 14 and CAR 15 d. Contractor quotations, coal price studies, the Baseline Design Report etc have all been referenced. Not all assumptions were able to be validated. Refer to CAR 14 and CAR 15.		
7.17	Timing of assumptions a. Are all assumed input values valid for the time of the investment decision? b. Are all capex costs valid at the time of the investment decision? Are there any sunk costs? c. Are all revenues and costs reasonable for the whole period as forecast? d. Are changes in costs or revenues scheduled or likely? Have such changes been incorporated and justified? e. Are the costs and revenues entered in the correct year when they will occur?	DR1 DR2 DR29 DR31 DR32 IV	a. It is not possible to determine the time of the investment decision, therefore it is not possible to determine if input values were valid at the time of the investment decision. A timeline is not included in section B.5, as required by the "Guidelines for completing the project design document" (PDD_guid04_v07), given that the starting date of the project activity is before the date of validation. Refer to CAR 12. b. Several of the financial and technical assumptions for the alternative scenarios are obtained from documents and studies undertaken after the time of the investment decision, including, but not limited to, coal price, land requirement for project and baseline scenarios, equipment/system costs, O&M values, discount rate, inflation, etc. CL 27: provide evidences and justification that each input value used in all investment analysis would be valid and applicable at the time of the investment decision taken by PPs. Land was already purchased for the ethanol factory before the decision to invest in the project activity. As the project activity will require more land than the baseline alternative, PPs included the cost of this additional land in the investment analysis. It is understood that PPs approach is correct, as using more land consists in a cost and plays an influence in the investment decision.	CAR 12 CL 27 CL 28	☑

	Checklist Question	Reference	Comment (based on the GSP-PDD, version 01)	Draft Conclusion	Final Conclusion
			c. Yes, the costs and revenues (savings) seem reasonable for the whole period. However, inflation that is applied to O&M costs is not applied to coal costs, which seems to be inconsistent. The PP reports that the highest 'peak' coal price reached in 2007/8 has been assumed and used in the analysis for conservativeness, while, in fact, coal price is expected to decline. Coal will be provided in a long-term contract. The approach adopted by PPs is considered reasonable. CL 28: provide justification why inflation has been applied to O&M costs, but not the coal price. d. Yes, the project cash flow shows the correct placement of capital expenditures (in the first year) and O&M during the following years, being affected by inflation. Inflation impact on coal price needs to be addressed by PPs. Refer to CL 28.		
7.18	Revenues Are all benefits of all the assessed alternatives incorporated in the analysis? (e.g. including revenues from by-products, reduced costs etc; consult with sector expert)	DR1 DR2	Yes. The main benefit promoted by the project is the saving in coal costs by its partial substitution with biogas, which has been considered in the investment analysis.	OK	☑
7.19	Costs Are all costs of all the assessed alternatives incorporated in the analysis? (e.g. including permit and licence costs, transport costs etc; consult with sector expert)	DR1 DR2 DR55 DR56 DR57	All cost for all assessed alternatives are incorporated in the analysis. In addition, there are no avoided costs associated with the project activity. Coal is still required in both alternatives and additional coal storage is not an issue. The required permits are the same for all alternatives – OK	OK	☑
7.20	Are there any policies, subsidies, incentives, grants, tax breaks etc that apply to any of the alternatives? Are these incorporated in the analysis? (refer to Clarifications on the consideration of national and /or	DR1 IV	There are no applicable and relevant policies, subsidies, grants or tax breaks for the project activity – OK	OK	☑

	Checklist Question	Reference	Comment (based on the GSP-PDD, version 01)	Draft Conclusion	Final Conclusion
	sectoral policies and circumstances in baseline scenarios, currently located at http://cdm.unfccc.int/EB/022/eb22_repan3.pdf)				
7.21	Is the assumed period of assessment appropriate? How has this been demonstrated? (i.e. based on economic lifetime of equipment/ assets or other dependent factors)	DR1 DR2 DR19 DR26 DR27 DR34	An assessment period of 10 years plus 1 year construction period is assumed. It is recognised that the ethanol factory and the co-generation system (boiler and generator) would last longer than this. For the project activity, this assessment period is apparently based on the guaranteed economic life of the CIGAR equipment (from a letter provided in 2009 – after the investment decision was made). The PP argues that the replacement or overhaul of this equipment after 10 years would represent a significant investment and this option would be assessed at the time as a separate and new investment decision – OK This may be valid for the project activity as the CIGAR system requires equipment that may only last 10 years. The baseline scenario entails digging lagoons only which would surely last more than 10 years. However, assuming only 10 years for the baseline is conservative – OK	OK	☑
7.22	Is any residual value of the project activity assets included in the analysis? Are residual value assumptions reasonable and justified and consistent with local accounting rules, international best practice and industry experience?	DR1 DR2 DR27	A residual value of 5% of the WWTP costs is assumed in both cases. This is in line with industry averages. The residual value is added in the final year of the cash-flow analysis - OK Tables 10, 11 and 12 in the PDD mention residual values and depreciation for the alternatives, which are not consistent with the spreadsheets. Same inconsistencies are found for NCVs and Capital costs in these tables CAR 16: fix tables 10, 11 and 12 and/or supplied spreadsheets in order to provide consistency between them.	CAR 16	☑
	Calculations				
7.23	Has the project participant supplied unprotected and traceable spreadsheet versions of all investment analysis?	DR1 DR2	Yes. However, it is not possible to track back the composition of some input values, such as capex costs, O&M costs and technical numbers. Refer to CAR 13, CAR 15 and CL 26.	CAR 13 CAR 15	☑

	Checklist Question	Reference	Comment (based on the GSP-PDD, version 01)	Draft Conclusion	Final Conclusion
		DR19 DR26 DR27		CL 26	
7.24	From the investment analysis provided, is it possible to reproduce the results?	DR1 DR2	Yes, except for the composition of some input values, as referred in 7.23. Refer to CAR 13, CAR 15 and CL 26.	CAR 13 CAR 15 CL 26.	☑
7.25	Have the listed input values been consistently applied in all calculations?	DR1 DR2	Mostly yes, however inflation, which is applied to O&M costs, is not consistently applied to coal price. Refer to CL 28.	CL 28	
7.26	Are the computations/ formula correct? (this includes the computations implicit in input values, such as technical calculations of the amount of energy demanded or sold etc)		'NPV C3' worksheet: ○ No tax is calculated as the comparison is before tax. The additional costs of the project activity would be tax deductable and would reduce the tax burden of the ethanol factory; this depends on accounting between BEI and IEI; pending on CL 23 ○ Some technical calculations are incorrect. Refer to CAR 13 and CL 26.	CL 23 CAR 13 CL 26	☑
7.27	Depreciation a. Are deprecation costs applied to depreciable assets only (not land)? b. Are the depreciation and major repair and maintenance costs consistent with the assessment period and the residual values? c. Are depreciation costs/ periods consistent with local accounting regulations? d. Are depreciation costs (and other non-cash items) related to the project activity excluded (not deducted) from net Cash Flow used for calculating the financial indicator (e.g. IRR, NPV)?	DR1 DR2	a. Depreciation is not relevant as tax is not incorporated in the analysis b. No major repair and maintenance costs are assumed – this is consistent with a 5% residual value and the economic lifetime of the equipment – OK c. N/A d. N/A	OK	☑

	Checklist Question	Reference	Comment (based on the GSP-PDD, version 01)	Draft Conclusion	Final Conclusion
7.28	Tax a. Is the treatment of taxation consistent with the chosen benchmark or discount rate? (i.e. taxation should only be treated as an expense in the IRR/NPV calculation if the chosen BM or DR is intended for post-tax calculations? For post-tax BMs or DRs: b. Are interest costs included in the calculation of net taxable income and thus tax? c. Are interest costs calculated in accordance with the Guidance on the Assessment of Investment Analysis d. Are depreciation costs included in the calculation of net taxable income and thus tax?	DR1 DR2	a. The IRR calculation is pre-tax for both alternatives and not included - OK b. N/A c. N/A d. N/A	OK	☑
7.29	Interest costs If a Project IRR has been used, are the costs of financing expenditures (i.e. loan repayments and interest) excluded from the calculation of Project IRR? (financing costs should not be deducted from Net Cash Flow) If an Equity IRR has been used, is the debt portion of the investment cost excluded as a cash outflow and the interest costs and principal repayments included as costs?	DR1 DR2 IV	Pre-tax NPV has been calculated and thus tax and interest costs are not incorporated – OK The PP reports that no loans are involved but “insistence of bank” is mentioned on page 23 of PDD and loans from bank is referred to on p24 of the PDD when discussing Barriers – CL 29: clarify or modify the term “insistence of bank” in page 23 of the PDD.	CL 29	☑
7.30	Recommenced project: If the implementation of the project ceased and then recommenced due to	DR1 IV	The project did not start, stop and then recommence.	OK	☑

	Checklist Question	Reference	Comment (based on the GSP-PDD, version 01)	Draft Conclusion	Final Conclusion
	consideration of the CDM, then: a. Are input values valid and applicable at the time of making the decision to recommence the project? b. Are capital costs that are incurred prior to the revised project activity start date input as the recoverable value of the assets (limited to the potential reuse/ resale of tangible assets)? c. How has the fair market value of the capital expenditures been calculated and validated? (e.g. by chartered specialists). Is this fair market value reasonable and justified?				
7.31	Sensitivity analysis: a. Are all variable and critical costs and revenues in the analysis included in the sensitivity analysis? b. Is the assessed range of variations reasonable in light of the reliability of the estimated input values and the likely range? c. If some variations create scenarios that change the conclusion/ result of the analysis, how likely/ probable are such scenarios (in the opinion of the DOE)? d. Is the sensitivity analysis possible to reproduce?	DR1 DR2 DR26 DR27 DR30 DR31 DR32 DR55 DR56 DR57	a. Parameters "coal price", "capital costs" and "O&M costs" are analyzed in the sensitivity analysis included in the PDD. However, the parameter "coal requirement", which is analyzed in the "Investment Comparison Analysis" spreadsheet, has not been included in Table 14 of the PDD. Assuming that the NCV of the used coal is constant, this parameter would be affected mainly due to the variation of ethanol production in each year. CL 30: justify why "coal requirement" or "ethanol production" has not been included in the sensitivity analysis presented in the PDD or include one or both parameters in the analysis presented in the PDD. b. Quality of calculation of reliability of the parameters used in the investment analysis must yet be improved by PPs, as requested in CL 25, CAR 13, CAR 14, CAR 15 and CL 27. As these requests are solved, the adopted range of variation (+ or – 10%) should be considered adequate. Discount rates are not subject to variation in the sensitivity analysis, but from calculations made by this DOE, at 10% or 15% discount rate, considering the currently available parameters, the	CL 25 CAR 13 CAR 14 CAR 15 CL 27 CL 30 CL 31	☑

	Checklist Question	Reference	Comment (based on the GSP-PDD, version 01)	Draft Conclusion	Final Conclusion
			baseline alternative still has a lower NPV - OK c. Given the uncertainty related to coal prices and amount of energy required, threshold values could be calculated. However, 10% is the standard amount of variation to analyse - OK Results • Coal price – even a 25% change in coal price does not change the result in favour of the project activity (without CDM) - OK • The result is not particularly sensitive to changes in O&M costs or investment costs - OK d. Yes, but it is not clearly calculated. In addition, the comparison is not easy to follow. Coal price will vary equally for both alternatives but capex and O&M costs could vary to one and not to the other. The variations in key parameters should be linked back to the original input assumption. For example, the NPV of the baseline is not linked to the assumed total amount of energy required. CL 31: provide, in a transparent way, the rationale on how the sensitivity analysis has been performed in the provided spreadsheet.		
7.32	Result		The result of the investment analysis shows that the project activity, without the CER revenues, produces a NPV of - 79,716 million IDR, being less financially attractive than the baseline scenario, which produces a NPV of - 75,430 million IDR. The sensitivity analysis shows that, even with a range of variation of + or - 10% in the key parameters, the project activity continues being less financially attractive, therefore indicating the project is additional. The confirmation of this result is pending on the resolution of CL 25, CAR 13, CAR 14, CAR 15 and CL 27 Although not required, the PDD also brings the NPV that results when CER revenues are included in the project scenario, showing that it becomes more attractive than the baseline scenario. Nevertheless, adopted CER prices and the demonstration of the calculation of the NPV of the project with CER revenues have not being supplied, neither in the PDD nor in the “Investment Comparison Analysis” spreadsheet. Therefore, this statement cannot be validated.	CL 25 CAR 13 CAR 14 CAR 15 CL 27 CL 30 CL 31 CL 32	☑

	Checklist Question	Reference	Comment (based on the GSP-PDD, version 01)	Draft Conclusion	Final Conclusion
			CL 32: provide adopted CER prices and the demonstration of the calculation of the NPV of the project with CER revenues or remove this statement from the PDD.		
	d) Barrier Analysis	**PDD Step 3**			
7.33	Has a barrier analysis been used?	DR1	Yes, the additionality demonstration also used the barrier analysis. ACM0014 requires a step wise approach to identify the baseline scenario, which includes a barrier analysis (Step 3) and, if more than one alternative is not prevented by prohibitive barriers, which is the case of the project activity that remained with 3 alternatives, a comparison of the economic attractiveness (Step 4) of each alternative has to be made. Step 3 of ACM0014 overlaps with Step 3 of the "Tool for the demonstration and assessment of additionality", while Step 4 of the methodology coincides with Step 2 of the tool. The barrier analysis required by ACM0014 should be conclusive in Step 3 of the identification of the baseline scenario in section B.4. The PDD brings 2 different barrier analyses, one in B.4 and other in B.5, with major inconsistencies. The barrier analysis carried on in B.4 does NOT follow the requirement of Step 3 to identify the baseline scenario of ACM0014, which refers to the Step 3 of the "Tool for the demonstration and assessment of additionality". CAR 17: adjust Step 3 in section B.4 of the PDD according to the guidelines of ACM0014, i.e., following Step 3 of the "Tool for the demonstration and assessment of additionality". Make sure all relevant barriers are considered, including those identified in section B.5., and analyzed for all alternatives.	CAR 17	V
7.34	Is a complete list of barriers that prevent the relevant alternatives and the proposed CDM project activity from occurring identified?	DR1	The PDD brings 2 sets of barriers: • In section B.4, Step 3 to identify the baseline scenario according to ACM0014 is not properly followed (Refer to CAR 17). Two barriers are identified (investment and technological), but it is not clearly explained how they are relevant to each of the identified alternatives. It is stated that scenarios W4 and W5 (project scenario without CDM) do not face barriers and cannot be eliminated.	CAR 17 CAR 18	☑

	Checklist Question	Reference	Comment (based on the GSP-PDD, version 01)	Draft Conclusion	Final Conclusion
			• In section B.5, Step 3 of the "Tool for the demonstration and assessment of additionality" is fully followed, however identifying 2 different barriers (technological and due to prevailing practice), which supposedly would prevent the project activity. This is inconsistent with the analysis carried out in section B.4. Besides, the barrier analysis made in B.4 should have been conclusive and section B.5 should repeat the analysis previously made or, preferably, should only refer to the results and make the conclusion. Refer to CAR 17. CAR 18: adjust Step 3 in section B.5 in order to ensure consistency with the Step 3 developed in section B.4.		
7.35	Do any such identified barriers have a clear and direct impact on the financial returns of the project activity? (these are not barriers and should be assessed in the investment analysis)	DR1 DR2	In section B.4, alternatives H1 and E1 are limited to the use of coal as fossil fuel, eliminating the possibility of using diesel. The reason claimed by PPs is that the cost of power generation with diesel is higher than the cost with coal. This so called barrier would clearly have impact on the financial returns and should not be used in the barrier analysis. Besides, this analysis is not valid, since it is comparing only the electricity generation cost and not the return on investment of the 2 different solutions for heat and power supply. Thus, scenarios H1 and E1 using diesel as fuel cannot be eliminated based on the claimed reason. Refer to CAR 11. PPs refer to 2 evidences to support the power generation costs with diesel and coal. Footnote #15 refers to an interview with Mr Dahlan Iskan, CEO of PT PLN, electric company of Indonesia, by the Internet-based Indonesian newspaper Tempo Interaktif. In this interview, costs to generate power with diesel (US$ 0.20 – 0.25/kWh) and coal (US$ 0.06 – 0.07/kWh) are just mentioned as a discussion argument, not related to any official assessment or statistic. Yet, this reference is dated on 15 July 2010, meaning that this information would not be available by the time of decision to invest in the project. Therefore, this reference can work as an indication, but not as a strong evidence of the cost/kWh with coal and diesel. The second reference, footnote #16, is a presentation of the APEC 10th Coal Flow Seminar & APEC 11th Clean Fossil Energy Seminar, held in Seoul, Korea, in December 2003. It says that small small-scale coal power plants will have a cost of US$ 0.05/kWh, while diesel	CAR 11	☑

	Checklist Question	Reference	Comment (based on the GSP-PDD, version 01)	Draft Conclusion	Final Conclusion
			generators will cost around US$ 0.09 – 0.10/kWh. The values for diesel generation are significantly different from those found in the other reference. Besides being a document that does not reflect the cost situation by the time of the investment decision, it cannot be considered a strong evidence, as it is not an official document. CL 33: provide proper evidences to support the costs regarding power generation with diesel and coal in Indonesia.		
7.36	Are the identified barriers real and substantiated by independent sources of data such as relevant national legislation, surveys of local conditions and national or international statistics?	DR1	On section B.4: • The barrier that would be faced by scenario W3 is real and the supporting evidence provided is of good quality, although the reference is not complete, which makes it very difficult to identify its source. It is also in accordance with ERM CVS internal knowledge, that aerobic treatment (scenario W3) by itself, in general, is not suitable for the treatment high organic load wastewater, mainly due to the high costs associated. However, the it is discussed in the PDD, it cannot be considered a technological barrier, since it is more relate to the associated costs and the common industry practice. CL 34: adjust the barrier claim or provide proper explanation or justification on the barrier faced by scenario W3. Additionally, complete the reference on footnote #14 in order to make it more accessible to the reader of the PDD. • Scenarios E2, E3, H2 and H3 are eliminated with the argument that the owner, “before consideration of CDM in connection with waste water treatment, had decided to install a coal-fired cogeneration plant”. This reason is not enough to disregard the alternatives E2, E3, H2 and H3. Refer to CL 22. Os section B.5: • Technological barriers - the demonstration of these barriers in the PDD is mainly based on technology risks of the project	CL 22 CL 34 CL 35 CL 36	☑

	Checklist Question	Reference	Comment (based on the GSP-PDD, version 01)	Draft Conclusion	Final Conclusion
			activity (covered anaerobic lagoon with biogas capture and usage for energy generation), which, according to the PDD, can be summarized as the risk associated to the performance in treating the wastewater, i.e., reducing the COD, due to the biological nature of the treatment. However, the wastewater treatment in open anaerobic lagoons is basically based on the same principles and would be subject to the same risks described in the PDD. Further, the CIGAR supplier offers a process warranty in its quotation, guaranteeing the COD reduction and the methane production. It is the understanding of this DOE that technology risks may be associated to the project activity, but the risk associated with the low COD reduction performance of the covered lagoon is also applicable to the baseline scenario (open anaerobic lagoons). According to the information in the PDD, the technological barrier is overcome because the project may generate CERs, which attracted financiers who would normally not finance this kind of project without CDM. Evidences to support the referred barriers (technology risks, ownership of BEI by ISSCP and the ERPA between ISSCP and PT Indonesia Ethanol Industry) have no been supplied. CL 35: provide justification for the claimed Technological Barriers, as well as supporting evidences to substantiate the claim and how the barrier is overcome. • PPs have also indicates that the project faces barriers due to prevailing practice, under the claim that this is the first-of-its-kind. It has been reasoned that the wastewater from ethanol plants has particular characteristics, thus a comparison against wastewater from palm oil or starch mills is not possible. This barrier would be overcome by the same reasons indicated for the Technological Barriers. However, differentiation between the ethanol plant wastewater and others was not fully explained and supporting evidences have not been supplied to substantiate such claims. CL 36: provide further explanation to justify why the ethanol plant		

	Checklist Question	Reference	Comment (based on the GSP-PDD, version 01)	Draft Conclusion	Final Conclusion
			wastewater cannot be compared with other types of wastewater and supply evidences to support the claimed barriers due to prevailing practice.		
7.37	Does an identified barrier or set of barriers prevent the implementation of the proposed CDM project activity? How has this been validated?	DR1	Pending on the resolution of CL 22, CL 34, CL 35 and CL 36.	CL 22 CL 34 CL 35 CL 36	☑
7.38	Do the identified barriers not equally prevent at least one of the possible alternatives (i.e. the baseline scenario)? How has this been validated?	DR1	Pending on the resolution of CAR 17, CAR 18 and CL 35	CAR 17 CAR 18 CL 35	☑
7.39	Is it clearly explained how the approval of the project in the CDM would enable the proposed project activity to surmount the barrier? Is the rationale reasonable and justified with evidence?	DR1	Technological barriers and barriers due to prevailing practice – it is explained that potential CERs "attracted BEI and ISCCP" as financiers, but evidences still need to be supplied. Refer to CL 35 and CL 36.	CL 35 CL 36	☑
7.40	Overall, is the Barrier Analysis presented credible and compliant with the applicable Tools?	DR1	The barrier analysis has not been properly developed in the PDD and there are several issues to be addressed by PPs before a conclusion can be reached on the credibility of the analysis. The "Tool for the demonstration and assessment of additionality" has not been properly followed. Refer to CAR 11, CAR 17, CAR 18, CL 22 and CL 33 to CL 36.	CAR 11 CAR 17 CAR 18 CL 22 CL 33 CL 34 CL 35 CL 36	☑
	e) Common Practice Analysis	**PDD Step 4**			
7.41	Is the proposed project activity a 'first of its kind'? Has sufficient evidence been provided to validate this claim?	DR1	PP claimed "first of its kind". Refer to CL 36.	CL 36	☑
7.42	Has common practice analysis been undertaken?	DR1	No, since it was claimed the project activity is "first of its kind". Pending on CL 36.	CL 36	☑
7.43	Is the geographical scope of the common practice analysis appropriate	DR1	Pending on CL 36.	CL 36	☑

	Checklist Question	Reference	Comment (based on the GSP-PDD, version 01)	Draft Conclusion	Final Conclusion
	for the assessment, considering the project activity's technology or industry type?				
7.44	Have all comparable projects been included in the common practice analysis? How was this assessed (by the DOE)? If some projects have been excluded as non-comparable, is the exclusion reasonable and justified?	DR1	Pending on CL 36.	CL 36	☑
7.45	Have similar and operational projects, other than CDM project activities, been undertaken in the region?	DR1	Pending on CL 36.	CL 36	☑
7.46	Are these widely observed and commonly carried out? If so: a. How have the essential distinctions with the proposed CDM project activity been assessed? b. Are such distinctions justified with sufficient evidence? c. If inaccessibility of data is the reason why some projects have not been included in the analysis, is justification of this claim provided?	DR1	Pending on CL 36.	CL 36	☑
7.47	Overall, is the proposed CDM project activity considered common practice?	DR1	Pending on CL 36.	CL 36	☑
8.	**Emissions Reductions**	**PDD B.6**			
	Explanation of methodological choices				
8.1	Is it explained how the procedures provided in the Methodology and applicable Tools are applied by the proposed project activity? (i.e. Are the	DR1 DR8 DR9	Yes, most steps are correctly and clearly followed, according to the project activity and the applicable methodology and tool (ACM0014 and the "Tool to determine project emissions from flaring gases containing methane"). However:	CAR 19 CAR 20	☑

	Checklist Question	Reference	Comment (based on the GSP-PDD, version 01)	Draft Conclusion	Final Conclusion
	required steps clearly followed?)		• The application of the "Tool to calculate the emission factor of an electricity system" for the calculation of EFgrid,y has not been explained at all. • The calculation/determination of PEEC,y has not been included in section B.6.1. CAR 19: explain the steps followed to determine EFgrid,y. CAR 20: include explanation about how PEEC,y is determined/calculated.		
	Project emissions:				
8.2	Is every choice of options for calculating project emissions offered by the methodology correctly justified? Is this justification in line with the situation as evidenced by site visits, local knowledge and supporting documentation?	DR1 DR8	Section B.6.1 of the PDD has basically transcriptions of the guidelines to calculate emissions from ACM0014 and the "Tool to determine project emissions from flaring gases containing methane". Application of the procedures of the methodology to the specific conditions of the project activity, in general, is not explained. Choices of default values are not explained nor justified. CL 37: In section B.6.1, specify the application of each methodological procedure to the project activity and provide explanations and justifications on the choices of methodological approaches and default values. Note that the methodology is applicable to different conditions and make considerations to each of them, however the PDD has to indicate which choices were made specifically to the project activity, to several possibilities. PEsludge,LA,y is excluded from the calculation of PEy with the justification that "the project activity does not introduce a treatment of sludge". However, this parameter refers to the land application of sludge removed from the anaerobic digester and should not be disregarded. CAR 21: Include the calculation of PEsludge,LA,y in the calculation of PEy in section B.6.1.	CL 37 CAR 21	☑

	Checklist Question	Reference	Comment (based on the GSP-PDD, version 01)	Draft Conclusion	Final Conclusion
8.3	Are the formulae and parameters required for the determination of project emissions correctly presented, enabling a complete identification of parameters to be used and / or monitored?	DR1 DR8	Most formulas and parameters used to calculate project emissions are correctly presented. Nevertheless, the PDD is not clear about which parameters are using assumptions, default values, calculated values or monitoring data: • Parameters to be monitored – they are not identified and assumed values for ex-ante calculations and their sources are not included (wastewater and effluent amounts; COD levels; Fbiogas,y; wCH4,biogas,y). CL 38: Identify parameters that will be monitored and indicate values used for ex-ante calculations of project emissions, with proper justification • Chosen default value for fd is not presented for the calculation of MCFPJ,y CL 39: Explain and justify the values applicable to fd in project emissions. • In page 34, in the application of Step 1 of the "Tool to determine project emissions from flaring gases containing methane", it is assumed "that 55% of residual gas is methane and 45% is nitrogen", however it does not make any reference to reason why the assumption is made and on what basis. CL 40: Explain and justify the assumption "that 55% of residual gas is methane and 45% is nitrogen", in page 34, in the application of Step 1 of the "Tool to determine project emissions from flaring gases containing methane"	CL 38 CL 39 CL 40	☑
	Baseline emissions:				
8.4	Is every choice of options for calculating baseline emissions offered by the methodology correctly justified? Is this justification in line with the baseline scenario?	DR1 DR3 DR4	Section B.6.1 of the PDD has basically transcriptions of the guidelines to calculate emissions from ACM0014 and the "Tool to determine project emissions from flaring gases containing methane". Application of the procedures of the methodology to the specific conditions of the project activity, in general, is not explained. Choices of default values are not explained nor justified. Refer to CL 37.	CL 37 CL 41	☑

	Checklist Question	Reference	Comment (based on the GSP-PDD, version 01)	Draft Conclusion	Final Conclusion
			The choice of EFBL,EL,y should be clearly demonstrated in section B.6.1. The PDD fails in demonstrating how EFgrid,y and EFBL,EL,captive are calculated and which one is chosen. Refer to CAR 20. CL 41: clearly demonstrate in section B.6.1 how EFBL,EL,y, and EFBL,EL,captive are determined or determined.		
8.5	Are the formulae and parameters required for the determination of baseline emissions correctly presented, enabling a complete identification of parameters to be used and / or monitored?	DR1 DR3 DR4	Most formulas and parameters used to calculate baseline emissions are correctly presented. Nevertheless, the PDD is not clear about which parameters are using assumptions, default values, calculated values or monitoring data: • Parameters to be monitored – they are not identified and assumed values for ex-ante calculations and their sources are not included (wastewater and effluent amounts; COD level; ECBL). CL 42: identify parameters that will be monitored and indicate values used for ex-ante calculations of baseline emissions, with proper justification • Chosen default value for fd is not presented for the calculation of MCFBL,y CL 43: explain and justify the values applicable to fd in baseline emissions. CAR 22: in page 30, the explanation “3.6 = Coefficient for converting to GJ to MWh” should be “3.6 = Coefficient for converting from GJ to MWh”.	CL 42 CL 43 CAR 22	☑
8.6	Are the applicable Tools and methods to calculate parameters correctly applied?	DR1 DR3 DR4	The application of the “Tool to calculate the emission factor for an electricity system” to calculate EFgrid,y is not included in the PDD. Refer to CAR 19	CAR 19	☑
	Leakage:				
8.7	Are all potential sources of leakage		N/A. Leakage closed out according to methodology	N/A	NA

	Checklist Question	Reference	Comment (based on the GSP-PDD, version 01)	Draft Conclusion	Final Conclusion
	correctly identified in accordance with the applied Methodology?				
8.8	Are the formulae and parameters required for the determination of leakage emissions correctly presented, enabling a complete identification of parameters to be used and / or monitored?		N/A	N/A	NA
8.9	Are the applicable Tools and methods for calculating leakage correctly applied?		N/A	N/A	NA
	Emissions Reductions:				
8.10	Are the parameters and equations used to calculate emission reductions correct?	DR1 DR3 DR4	Yes, parameters and formulas are according to ACM0014.	OK	V
	Data and Parameters	PDD B.6.2			
8.11	Is the list of parameters presented in chapter B.6.2 of the PDD considered to be complete with regard to the requirements of the applied methodology and any applicable tools?	DR1	Mostly, the list of parameters is complete. The parameters related to sludge are not included (EFN2O,LA,sludge; MCFsludge,ha; GWPN2O); pending on CAR 21 The calculation of EFgrid,y has not been described in the PDD or any other supplied documentation, thus it is not possible to determine if there are data and parameters not monitored that should be included in B.6.2. Pending on CAR 19.	CAR 19 CAR 21	☑
8.12	For each parameter: a. Title in line with Methodology? b. Data unit correctly expressed? c. Appropriate description? d. Source clearly referenced? (and appropriate?) e. Correct value provided? f. Has this value been verified? g. Choice of data correctly justified? h. Measurement method correctly	DR1 DR3 DR4	CODout,x a. OK b. OK c. OK d. Source “design features of the baseline open lagoon system” is not clear. CL 44: provide proper reference for CODout,x. e. The value of 135 tCOD/yr is based on the COD concentration of the final effluent (300 mg/l), which refers to the complete treatment of the wastewater in all stages, including aerobic or facultative lagoons. This COD value should refer to the effluent from the 2nd open anaerobic lagoon in the baseline scenario,	CL 44 CL 45 CL 46 CL 47 CL 48 CL 49 CL 50 CAR 19 CAR 23 CAR 24 CAR 25	☑

	Checklist Question	Reference	Comment (based on the GSP-PDD, version 01)	Draft Conclusion	Final Conclusion
	described?		which according to the Baseline Study Report, is calculated to be 1,530 mg/L. CAR 23: adjust value of CODout,x in B.6.2. f. Refer to item (e) above. g. Refer to item (e) above. h. Not measured. CODin,x a. OK b. OK c. OK d. Source “design features of the baseline open lagoon system” is not clear. CL 45: provide proper reference for CODin,x e. The value of 38,250 tCOD/yr is based on the COD concentration of the original wastewater (85,000 mg/l), before the pre-treatment. This COD value should refer to the wastewater after the pre-treatment, right before entering the 1st open anaerobic lagoon in the baseline scenario, which according to the Baseline Study Report, is calculated to be 68,000 mg/L. CAR 24: adjust value of CODin,x in B.6.2. CL 46: provide justification and evidences to support the expected COD content of 85,000 mg/L of the wastewater from cassava ethanol plants. i. Refer to item (e) above. j. Refer to item (e) above. f. Not measured B0 a-h: OK fd a. OK	CAR 26 CAR 27 CAR 28 CAR 29 CAR 30 CAR 31 CAR 32	

	Checklist Question	Reference	Comment (based on the GSP-PDD, version 01)	Draft Conclusion	Final Conclusion
			b. OK c. No. Instead of source of data used, optional values are included. CAR 25: include the source of the data used for fd and move optional values, adding them to the space "Justification of the choice of data or description of measurement methods and procedures actually applied". d. OK e. Value is correct, however it is notated as a fraction, while it should be percentage CAR 26: fix notation of the used value for fd. f. OK g. OK h. Not measured D a. OK b. No. Unit for meter should m, not M. CAR 27: fix unit used for D; instead of M, use m. c. OK d. Source "design specification of the baseline open lagoons system" is not clear. CL 47: provide proper reference for D. e-h OK EFgrid,y a. OK b. OK c. OK d. OK e. Pending on CAR 19 f. Pending on CAR 19 g. Pending on CAR 19		

	Checklist Question	Reference	Comment (based on the GSP-PDD, version 01)	Draft Conclusion	Final Conclusion
			h. Pending on CAR 19 EFCO2,FF,captive a. This parameter is misplaced; it is described to refer to "baseline emission factor for the electricity generated and/or consumed in the absence of the project activity in the year y", but this would in fact refer to EFBL,EL,y, which is a calculated parameter (i.e., not to be listed). CAR 28: remove the first parameter EFCO2,FF,captive from the list of parameter in B.6.2. b-h. Refer to CAR 28 EFCO2,FF,captive a. OK b. No. Unit should be tCO2/GJ, while the PDD presents tCO2/TJ. CAR 29: fix unit of EFCO2,FF,captive to tCO2/GJ c. OK d. OK e. No. Value has to be converted to tCO2/GJ. CAR 30: convert value according to the proper unit. f. Pending on CAR 28 and CAR 29. g. Justification for the choice of data is not stated. CL 48: justify the use of the value for EFCO2,FF,captive. h. Not measured ηel,captive a. OK b. OK c. OK d. Value was obtained from Annex 1 of the "Tool to calculate the emission factor for an electricity system", which is not referred in ACM0014. On the other hand, considering that source options provided by the methodology do not seem to be applicable to the situation of the project activity, it seems to be		

	Checklist Question	Reference	Comment (based on the GSP-PDD, version 01)	Draft Conclusion	Final Conclusion
			a correct approach. OK e. Used value seems to be applicable to the project activity, given the available options in the source. It also seems to be conservative. OK f. OK g. As the source and values used are not precisely following the methodology, further justification is required. CL 49: provide proper justification for the use of Annex 1 of the "Tool to calculate the emission factor for an electricity system" as the source of data and for the chosen value. h. Not measured FLbiogas,digest a-h OK GWPCH4 a-h OK A a. OK b. Unit required by ACM0014 is ha, while the PDD used m2. CAR 31: fix the unit from m2 to ha for A. c. OK d. Source "design specification of the baseline open lagoons system" is not clear. CL 50: provide proper reference for D. e. Value is expressed in m2 and should be in ha. CAR 32: convert value from m2 to ha. f. Pending on CAR 19 g. Pending on CAR 19 h. Pending on CAR 19		
8.13	Will the data and parameters result in a conservative estimate of emissions	DR1	CAR 23 and CAR 24 will have a major influence in the calculation of ex-ante emission reductions. Values that have been considered in the	CAR 23	☑

	Checklist Question	Reference	Comment (based on the GSP-PDD, version 01)	Draft Conclusion	Final Conclusion
	reductions?	DR3 DR4	PDD for COD content of the wastewater to the anaerobic lagoons and of the effluent from the anaerobic lagoons, both in the baseline scenario, would lead to overestimated baseline emissions and, therefore, to a non-conservative of emission reductions. Refer to CAR 23 and CAR 24.	CAR 24	
	Ex-ante calculation of emission reductions	**PDD B.6.3**			
8.14	Is the projection based on the same procedures as used for future monitoring?	DR1 DR3 DR4	Yes, projection is based on the same procedures used for future monitoring.	OK	☑
8.15	Are the GHG calculations documented in a complete and transparent manner?	DR1 DR3 DR4	Tables 21 to 23 and 30 to 31. Calculations in the PDD are not transparently shown and values in the referred tables are not included, being only referred to Annex [3], without further explanation. Tables provided in Annex 3 do not offer a clear understanding on how calculations were carried on. CAR 33: values should be inputted in tables 21 to 23 and 30 to 31; tables and calculations in Annex 3 should be incorporated in section B.6.3, with the proper indication on how calculations are made. As section B.6.1 does not indicate the source of or how each input value that will be used in the calculations (Refer to CL 37, CL 38 and CL 42), the understanding depends on doing a thorough investigation of the "Emission Reduction Calculation" spreadsheet. In many cases, input values used in B.6.3 have no reference to a source or its applied calculation method. CL 51: provide sources and/or transparent calculations for the following parameters: 1) CODout,x; 2) CODin,x; 3) FPJ,dig,m; 4) wCOD,dig,m; 5) EGPJ,y; 6) EFgrid,y; 7) CODPJ,effl,dig,y; 8) CODPJ,effl,lag,y; 9) wCOD,effl,dig,m; 10) FPJ,effl,lag,m; 11) wCOD,effl,lag,m; 12) Fbiogas,y; 13) wCH4,biogas,y; 14) T2,m. Note that any assumption or consideration has to be fully explained in sections B.6.1, B.6.2 and/or B.7.1 and transparently demonstrated in the calculations of B.6.3.	CAR 33 CL 37 CL 38 CL 42 CL 51	☑

	Checklist Question	Reference	Comment (based on the GSP-PDD, version 01)	Draft Conclusion	Final Conclusion
8.16	Are detailed calculations provided in a traceable spreadsheet showing relevant information?	DR1 DR3 DR4	Yes, but not all the provided information is traceable or justified. Refer to CL 51. PPs indicate that, in the first year, production of ethanol (and wastewater), will be 30%, 2nd year 50%, 3rd year 75 % and then 100%. These factors are applied for calculations of project and baseline emissions, however it is not explained in the PDD. CL 52: provide explanation on the evolution of the production of ethanol and wastewater. COD available and CODPJ,available, which are ultimately used in the calculation of MCFBL,y and MCFPJ,y, were calculated in way that considered the wastewater flow the open anaerobic lagoons (baseline) or anaerobic digester (project activity) distributed during 12 months of the year, however the ethanol plant operates for 300 days, according to the supplied information in the PDD. The amount of COD treated should be distributed in 10 months (300 days), considering that during 2 months per year, only the remained COD will still decay in the treatment system. CAR 34: recalculate CODavailable,m and CODPJ,available,m considering the generation of wastewater exclusively during the months of operation of the ethanol plant, i.e., distributing the wastewater flow in 10 months.	CL 51 CL 52 CAR 34	☑
8.17	Can the calculation of baseline emissions be replicated using the data and parameters supplied in the PDD?	DR1 DR3 DR4	There are values that are just plugged in tables, without further explanation or reference. Refer to CL 51.	CL 51	☑
8.18	Is the data provided in this section consistent with data as presented in other chapters of the PDD?	DR1 DR3 DR4	Refer to CL 51.	CL 51	☑
	Summary of ex-ante estimation of emission reductions	PDD B.6.4			
8.19	Is the form/ table required for the indication of projected emission	DR1	Data is consistent, but there should be the reference to each specific year (2011, 2012, 2013,…), not a period.	CAR 35	☑

	Checklist Question	Reference	Comment (based on the GSP-PDD, version 01)	Draft Conclusion	Final Conclusion
	reductions correctly applied? And is the data provided in this section consistent with data as presented in other chapters of the PDD?		CAR 35: adjust table 34 in the PDD, including the information for each year.		
8.20	Is the projection in line with the envisioned time schedule for the project's implementation and the indicated crediting period?	DR1	Since ethanol plant, CIGAR, etc is still under construction, the envisioned time schedule is not clear. Refer to CL 1.	CL 1	
9	Monitoring Plan (CDM VVM EB 44 (para.120-122))	PDD B.7			
	(a) Compliance of the MP with the methodology				
9.1	Are all necessary parameters required for the type of project by the methodology and applicable tools contained in the monitoring plan?	DR1	Yes. However, parameters FCcoal,y; NCVcoal,y; EGy and NCVBiogas,y are not part of calculations required by ACM0014 or tools used by the project activity, being irrelevant for the calculation of emission reductions of the project activity. On the other hand CODsludge,LA,y, SLA,y and wN,sludge,y are sludge parameters and could not be omitted. CAR 36: remove parameters FCcoal,y; NCVcoal,y; EGy and NCVBiogas,y from B.7.1 and include CODsludge,LA,y, SLA,y and wN,sludge,y The calculation of EFgrid,y has not been described in the PDD or any other supplied documentation, thus it is not possible to determine if there are data and parameters not monitored that should be included in B.7.1. Pending on CAR 19.	CAR 19 CAR 36	☑
9.2	For each parameter, is the: a. Title in line with methodology? b. Data unit correctly expressed? c. Parameter appropriately described? d. Source clearly	DR1	CL 53: applicable to all the listed parameters that are to be measured (according to requirements of PDD_guid04_v07) – include to each measurable parameter: 1) references to person/entity in charge of measurement; 2) references to industry/international/national standards that are applicable to the measurement procedures; 3) accuracy of the measurement method. **FPJ,dig,m** a-f OK	CAR 13 CAR 24 CAR 37 CAR 38 CAR 39 CL 6 CL 14 CL 25	☑

	Checklist Question	Reference	Comment (based on the GSP-PDD, version 01)	Draft Conclusion	Final Conclusion
	referenced? e. Correct value provided for the purpose of PDD estimations? f. Has this value been verified? g. Measurement methods correctly described and in line with the methodology/tools? h. Correct reference to standards (i.e. for calibration and maintenance)? i. Indication of accuracy provided? j. QA/QC procedures described? k. QA/QC procedures appropriate?		g. Monitoring equipment poorly described or located in the project site. Refer to CL 6 and CL 14. j-k OK **wCOD,dig,m** a-d OK e. Refer to CAR 24. f. Pending on CAR 24. g. CL 54: provide brief explanation on measurement method for wCOD,dig,m. j-k OK **T2,m** a-c OK d. CL 55: specify source of data for T2,m. e. OK f. OK g. CL 56: provide specific information regarding measurement procedures of T2,m (e.g. data collection from external reports from a certain source) and monitoring frequency. j-k. OK **EGPJ,y** a-d OK e. Refer to CL 26 f . No, value is inconsistent with other parts of the PDD and spreadsheets. Pending on CL 26. g. The explanation of the method to calculate the net electricity (discounting the electricity consumption by the wastewater treatment facility) generated with the use of biogas is NOT clear. Such method or any other is not addressed anywhere else in the PDD. The rationale to calculate this parameter in the “Investment Comparison Analysis” and “ER Calculation” spreadsheets is not considered appropriate. For this	CL 26 CL 51 CL 53 g. CL 54 d. CL 55 g. CL 56 CL 57g. CL 58 CL 59 CL 60 CL 61 CL 62 CL 63	

	Checklist Question	Reference	Comment (based on the GSP-PDD, version 01)	Draft Conclusion	Final Conclusion
			calculation, basic information regarding the energy output of the boiler and the turbine is missing (refer to CAR 13). The method should not require any consideration on the use of coal or the total electricity generated. CL 57: provide proper calculation method for EGPJ,y in B.6.1, demonstration in B.6.3, adjust calculation in the "Investment Comparison Analysis" and "ER Calculation" spreadsheets and proper referencing in B.7.1. j-k Refer to g. CL 54. **FPJ,effl,dig,m** a-k OK, except g. Refer to CL 6 and CL 14. FPJ,effl,lag,m a-k OK, except g. Refer to CL 6 and CL 14. wCOD,effl,dig,m a-d oK e. Refer to CL 51. f. Pending on CL 51 g. CL 58: provide brief explanation on measurement method for wCOD,effl,dig,m. j-k OK **wCOD,effl,lag,m** a-k OK, except g. CL 59: provide brief explanation on measurement method for wCOD,effl,lag,m. **Fbiogas,y** a-d OK e. Value has been calculated in the "ER Calculation" spreadsheet, based on the "COD conversion to CH4" that would take place in the		

	Checklist Question	Reference	Comment (based on the GSP-PDD, version 01)	Draft Conclusion	Final Conclusion
			anaerobic digester. The rationale of the method, in the opinion of this DOE, is reasonable, as the methodology or the tools do not offer other means to calculate this parameter. Nevertheless, the use of a value of 0.8 for MCF is inconsistent with the methods presented in ACM0014. MCFPJ,y would be more suitable, in order, to guarantee consistency and conservativeness. CL 60: adjust calculation method of Fbiogas,y, using MCFPJ,y, and include it in section B.6.1, with full explanations and justifications, and the demonstration of the calculation in section B.6.3, with the proper adjustements in B.6.2 and B.7.1, as needed. f. Pending on CL 60 g. Monitoring equipment poorly described or located in the project site. Refer to CL 6 and CL 14. j-k OK **wCH4,biogas,y** Parameter overlaps with fvi,h, from the "Tool to determine project emissions from flaring gases containing methane" (OK) a-c OK d. The parameter needs measurement and calculation. Such explanation is not available in the PDD or other documentation. CL 61: fix the source of data for wCH4,biogas,y and provide in section B.6.1 the explanation on how this parameter is obtained, with the demonstration of its calculation in section B.6.3. e. OK f. OK g. Measurement procedures, which indicates continuous measurement, is switched with monitoring frequency information; the information is inconsistent. CL 62: PPs have to indicate what type of equipment IS GOING to be used, not just leave it open for different possibilities, as written in the methodology. Adjust and expand the information on wCH4,biogas,y about the measurement methods, in order to make it specific for the project activity. h-k. Proposed QA/QC measures are not clear.		

	Checklist Question	Reference	Comment (based on the GSP-PDD, version 01)	Draft Conclusion	Final Conclusion
			CL 63: provide clear explanation on how the confidence level will be controlled and met by the measurement methods of wCH4,biogas,y. **FVRG,h** Parameter from the "Tool to determine project emissions from flaring gases containing methane"; is the same as Fbiogas,y, therefore does not need to be repeated. CAR 37: remove parameter FVRG,h from B.7.1. **Tflare** a-d OK e. Value for this parameter is not applicable, since it is not used in the calculations. CAR 38: remove value for Tflare. j-k The presented text is misplacing in formation among the items. Refer to the "Tool to determine project emissions from flaring gases containing methane". CAR 39: adjust information for Tflare in B.7.1.		
	(b) Implementation of the MP				
9.3	Are the arrangements described in the plan feasible and practical within the project design? How has this been verified (review procedures, interviews, project plans, and physical inspection)?	DR1	The proposed arrangements in the monitoring plan are feasible and practical. In fact, the description is very generic, as ACM0014 only indicate the parameters to be monitored and does not specify procedures. The successful implementation of the described MP will depend on how the cited CDM Department will be structured, on its capacity to design and execute proper procedures for O&M and monitoring. Procedures and equipment to monitor data and parameters still have to be better described and characterized, as requested in CARs and CLs in item 9.2. The feasibility of the plan was verified by checking the design of the wastewater treatment facility, the layout of the cassava ethanol plant, procedures described in the PDD and interviews during the on site visit.	Refer to CARs and CLs of 9.2	☑
9.4	Is the operational and management structure clearly described and in compliance with the envisioned	DR1	The operational and management structure are clearly described, including responsibilities for data collection and archiving involving the CDM Department. However, it is not clear how this department will be	CL 23 CL 64	☑

	Checklist Question	Reference	Comment (based on the GSP-PDD, version 01)	Draft Conclusion	Final Conclusion
	situation? Are responsibilities and institutional arrangements for data collection and archiving clearly provided?		linked to IEI and/or BEI. Refer to CL 23. CL 64: provide more information on how IEI and BEI will interact on the activities involving the CDM project.		
9.5	Is necessary monitoring equipment in place or readily available?	DR1	Yes, monitoring equipment has to be in place and readily available to measure essential parameters for calculating emission reductions. As the project activity is still in the early stages of implementation, no monitoring equipment could be checked during the on-site visit. Required monitoring equipment have not been adequately described in sections A.4.3, B.7.1 or B.7.2 and further information is required. Refer to CL 6 and CL 14.	CL 6 CL 14	☑
9.6	Does the monitoring plan represent current good monitoring practice?	DR1	Yes, the monitoring plan presents good monitoring practices, although the plan is described on a very high level. It is stated in the monitoring plan that "any deficiencies in methane flow monitoring data will be rectified by calculation from power generation data". However, the energy generation of the cogeneration plant does not seem to be a reliable parameter to estimate the amount of biogas captured and burnt. CL 65: clarify how power generation data can be correlated to the biogas (CH4) flow or remove this possibility from the MP.	CL 65	☑
9.7	Are the means of implementation of the monitoring plan, including data management and QA/ QC procedures, sufficient to ensure that the emission reductions achieved can be reported ex-post and verified?	DR1	The implementation of the monitoring plan has not started yet. The monitoring plan presented in the PDD, with the resolution of CARs and CLs of items 9.2 to 9.7, would ensure proper ex-post reporting and verification of emissions reductions Monitoring and O&M manuals, as well as training to the staff involved in monitoring and O&M, are yet to be prepared and executed before the start of operation of the project activity. As per CDM routine, during the first verification these topics need to be checked and verified.	FAR1	Far1
10	**Sustainable Development** (				
10.1	Does the Letter of Approval from the Host Party confirm that the project activity contributes to the sustainable development of that country?	DR1	LoA from Host Party is not yet available. Refer to CAR 2.	CAR 2	☑

	Checklist Question	Reference	Comment (based on the GSP-PDD, version 01)	Draft Conclusion	Final Conclusion
11	**Environmental Impacts**	**PDD D.**			
11.1	Has an analysis of the environmental impacts of the project activity been undertaken? Does the analysis conclude that the project will create any unacceptable adverse environmental impacts?	DR1 DR12 IV DR47	According to the PDD, an EIA for the complete ethanol plant was conducted. Based on interviews with PP, there was an original EIA with open lagoons and, later, a modified one with the CIGAR principle and the project activity included. The EIA (2nd version with CIGAR and methane recovery included) was approved on 8 May 2009, but it is not clear if the approval refers to the 1st or 2nd version. According to the PDD, the EIA comprised air quality, water quality and noise. However, there are many other topics to be assessed in an EIA, including health & safety and social impacts. For air quality, the PDD presents a comparison between the project and baseline activity, but this is CDM related, has no relation with EIA. PDD (in D.2) states that no negative impacts are expected from the project, but it is not stated whose expectation this is and on which facts this was based. CL 66: provide a more complete description on the findings and conclusions of the EIA related to the project activity.	CL 66	☑
11.2	In accordance with the laws and regulations in the Host Country, does this project require an EIA? If so, has a valid EIA been conducted? Has this EIA been approved?	DR1 DR12 DR47 IV	This project requires an EIA according to Indonesian regulations. CL 67: supply the approved EIA related to the project activity and evidences of its approval by local Indonesian authorities.	CL 67	☑
11.3	Does the environmental analysis undertaken and presented for the project activity include an analysis of trans-boundary impacts?	DR1 DR12 IV	No, the analysis presented in the PDD is very brief and does not cover trans-boundary impacts. Refer to CL 66.	CL 66	☑
11.4	Is the analysis in the PDD fully consistent with the findings of the EIA? Are all significant impacts and mitigation measures identified in the EIA mentioned in the PDD?	DR1 DR12	Refer to CL 66 and CL 67.	CL 66 CL 67	☑
12	**Local Stakeholder Consultation**	**PDD E.**			

	Checklist Question	Reference	Comment (based on the GSP-PDD, version 01)	Draft Conclusion	Final Conclusion
12.1	Have comments from relevant stakeholders been invited prior to the publication of the PDD on the UNFCCC website?	DR1 DR39 DR48	Yes, stakeholders were invited for comments on the project activity.	OK	☑
12.2	Have all relevant local stakeholders been included in the consultation? a. Have appropriate media been used to invite comments by local stakeholders? b. Have all stakeholder groups had access to information? c. Have all stakeholder groups had a reasonable chance to comment?	DR1 DR39 DR48 SV IV	a. Letters, public announcements and direct invitation by email or phone were used and a notice was posted on the community hall, which seem appropriate media, and Bahasa was used (local language) b. Only stakeholders who attended the meeting had access to the project information; some stakeholders could not be contacted or were not able to attend. From the Indonesian GS supporters, only 1 out of 5 groups were able to attend the LSC meeting CL 68: clarify if stakeholders, other than those who attended the meeting, had access to the information regarding the project. c. Based on the PDD and the GS LSC report, most stakeholders were able to comment, but the attending public was composed of 92% of man CL 69: clarify if the predominantly male attending public can be considered representative.	CL 68 CL 67	☑
12.3	Is the summary of comments received as provided in the PDD complete?	DR1 DR39 DR46 DR48 SV IV	Based on comparison of PDD with GS LSC report, it covers all topics. During site visit, local residents, farmers and community leaders have been interviewed and this suggests that the PDD summary is complete regarding comments made by stakeholders. However, nor PDD or the Stakeholder Meeting Report cover how each of the comments were taken into consideration. CL 70: Provide information on how each of the comments received in the stakeholder meeting were taken into account by PPs.	OK	☑
12.4	Has due account been taken of any stakeholder comments received and is this adequately and clearly described in	DR1 DR39 DR48	According to the PDD, potential leakage of CH4 is the main commented concern by the stakeholders. The PDD summarizes some measures to address this concern.	FAR1	FAR1

	Checklist Question	Reference	Comment (based on the GSP-PDD, version 01)	Draft Conclusion	Final Conclusion
	the PDD?	SV IV	FAR 1: provide evidences to the DOE, during the verification of the first monitoring period, that measures to properly address concerns regarding CH4 leakage, reported by stakeholders, were taken.		

Appendix C: REMEDIATION FORM

Corrective action requests (Questions in the report, which refer to a previous raised CAR are not included in this summary and hence this summary can only be used together with the main protocol table)	Reference to checklist question	**Summary of project participants' response**	**Final conclusion**
CAR 1: Correct or exclude reference to table B.3-1	4.3 4.5	The table reference no. has been corrected in the revised PDD v.2	Reference was corrected. CAR1 has been closed out.
CAR 2: Provide LoA issued by the Host Party.	5.2 5.3 5.6 5.7 6.8 10.1	The LoA will be provided to the DOE as soon as it is issued by the Host Party. Second Round Response: The Host Country LoA has been attached herewith [DR 30].	The Host Party LoA has now been provided [DR 30]CAR 2 is closed out
CAR 3: provide LoA issued by Annex 1 country.	5.4 5.5 5.6 5.7	The LoA will be provided to the DOE as soon as it is issued by the Annex 1 Party. Second Round Response: The Annex 1 LoA will be provided as soon as received.	The Annex 1 Party LoA has now been provided [DR 31]. CAR 3 is closed out.
CAR 4: Please provide the justification/explanation why CH4 and N2O baseline emissions are excluded from the thermal energy generation component to make is aligned with ACM0014.	6.7	The justification for excluding CH_4 and N_2O from thermal energy generation has been corrected in the revised PDD v.2.	Corrections have made it aligned with ACM0014. CAR4 is closed out.
CAR 5: redo the comparison between different lagoon design options to define scenario W1, in order to meet the requirements of ACM0014, particularly regarding the limitation of the comparison to the open anaerobic lagoon part of the baseline WW treatment.	6.11 7.12	The comparison analysis for scenario W1 has been reworked in the revised PDD v.2 The revised PDD now includes alternatives similar to Option 3 in PDD v.1 but with anaerobic lagoons depth of 4m and 5m (followed by a facultative pond) in addition to the 3 options provided in the PDD v.1.	Two more options comparable with option 3 but different depth were added. CAR5 is closed out.

Corrective action requests (Questions in the report, which refer to a previous raised CAR are not included in this summary and hence this summary can only be used together with the main protocol table)	Reference to checklist question	**Summary of project participants' response**	**Final conclusion**
CAR 6: correct the sentence in the last paragraph of page 14 of the PDD; instead of "(…) from the options defined in	6.11	The error has been corrected in the revised PDD v.2.	CAR6 is closed out.
CAR 7: revise the first paragraph of page 15 and readdress the approach to step (b) to define the W1 scenario.	6.11	As per the methodology, Step 1 (b) states - Carry out an economic assessment of the identified options, as per the guidance under Step 4 below. Choose the least cost lagoon design option from the options defined in Step 1 taking into account all relevant local conditions (e.g. land requirements, land prices, ground water level). It is important to note that the Step 4 herein referred actually refers to the Step 4 of the 'Tool for the demonstration and assessment of additionality'. Hence the PP feels the paragraph (in the PDD) referred by the DOE does not require any changes.	Simple cost analysis has been carried out as requested in the methodology and this is correct. Though the wording might or might not be precise, this is not important, since the analysis is ok. CAR7 is closed out.
CAR 8: Redo the economic assessment of the identified options, as required by step (b) to define the W1 scenario, limiting the analysis to the investment cost of the anaerobic lagoon design options and choosing the least cost option as the W1 scenario. Make sure all the key information for the cost composition of each option is clearly and transparently presented in the PDD.	6.11	As per the methodology ACM0014 ver3.1,Step 1: Identification of baseline scenario, it is required to 'Define several lagoon design options for the particular wastewater stream that meet the relevant regulations and take into consideration local conditions'. While designing different lagoon design options for wastewater treatment it is apparent that the design for the subsequent process for wastewater treatment will also be impacted i.e. an open lagoon with 4 m depth will require different size facultative pond as compared to a 6m depth lagoon as the COD content of effluent entering the facultative pond will be different. Hence it is considered more realistic and appropriate to compare the complete wastewater treatment system design rather than limiting the analysis to investment cost of the anaerobic lagoon of different depths. Also as this exercise is done to identify the specifications of the baseline wastewater treatment scenario: W1 -The use of open lagoons for the treatment of the wastewater, the PP feels it's appropriate to consider the complete open lagoon based wastewater treatment design rather than just the anaerobic lagoons. Further this is also in alignment with Step 1 of the methodology wherein it refers to carry out economic assessment based on Step 4 of the methodology. As discussed during the site visit (and also during the meeting with the	With the 2 options added (with comparable electricity use) and the explanation in adjacent cell plus the additionally provided evidences (DR23) and cost calculations for 5 scenarios (DR69), the analysis can now be judged to be more complete and comprising the necessary options. The options treat wastewater to differing levels of residual COD but the rationale provided is clear and accepted - OK The revised NPV analysis is over 15 years and is accepted as accurate - OK It has now been made clear that the high construction costs for aerated lagoons are due to the need for reinforcement of the

Corrective action requests (Questions in the report, which refer to a previous raised CAR are not included in this summary and hence this summary can only be used together with the main protocol table)	Reference to checklist question	Summary of project participants' response	Final conclusion
		author of the baseline design report) the PP would like to inform that the baseline report has been prepared by PT. Tirtakreasi Amrita, a reputed wastewater solutions company. The company has more than 15 years of experience as an EPC contractor for wastewater solutions in Indonesia and abroad. All the assumptions for civil works, chemical and labour cost are based on the years of experience PT. Tirtakreasi Amrita while working as an EPC contractor in the region. The evidence for the land cost in based on the feasibility report of the ethanol plant. (Relevant pages of the report have been submitted to the DOE earlier). As per this report the total cost incurred for 206m,098 m^2 land (purchase + leveling) in 2008 is IDR 3861 million which is approximately IDR 19,000/m2.Hence the baseline report assumes a land cost of IDR 20,000/m^2 in 2009.Please refer evidence 17 submitted during site visit to cross check the land area. For electricity cost the evidence has been attached herewith (please refer section 1.1) .The same document can be found from the link below - http://www.bpk.go.id/web/?page_id=917 (chapter 2: PLN). As can be seen from the evidence the generation cost of electricity from PLN was around IDR 930/kwh. Hence the baseline study report assumed an average price of IDR 900/kwh. The worksheets for cost calculations referred in the baseline study report have been attached herewith. The detail cost break up for all the 5 baseline lagoon scenarios have been provided in the revised PDD v2 Annex 5. Second Round Response: (i) Please refer to the PP response in CL16. (ii) The NPV analysis for the baseline scenario has now been assessed for 15 years. The revised baseline study report has been	walls of aerated lagoons. It is also confirmed that 'even if the construction cost of aerated lagoon is assumed to be zero, the Option 3 still remains the most financially attractive alternative' - OK Land costs have now been excluded from the NPV analysis. Given that the chosen Option uses the least land, this is accepted as conservative - OK Land costs have now been excluded from the NPV analysis. Given that the chosen Option uses the least land, this is accepted as conservative - OK CAR8 is closed out

Corrective action requests (Questions in the report, which refer to a previous raised CAR are not included in this summary and hence this summary can only be used together with the main protocol table)	Reference to checklist question	Summary of project participants' response	Final conclusion
		attached herewith. (iii) As known the aerated lagoon requires surface aerator. Due to the vibrations of aerators the lagoon walls needs to be further strengthened (concreting and reinforcement). Hence the additional cost. Further even if the cost of aerated lagoon is assumed to be zero, the Option 3 still remains the most financially attractive alternative. (iv) Please refer to the PP response in CL19 (v) The land cost has now been assumed as zero in the revised baseline study report. The revised capital expenditure and the financial assessment have been attached herewith as evidence 51. As can be seen from the revised financial assessment Option 3 is still the most attractive baseline alternative. . (vi) This was an error. The construction cost for the 2nd anaerobic lagoon has been corrected in the revised baseline study report.	
CAR 9: remove from Step 1 the conclusion that scenarios H1 and E1 are the most plausible scenarios, as scenarios H2, H3, E2 and E3 cannot be simply disregarded.	6.11	The suggestion has been incorporated in the revised PDD v.2 Second Round Response: The correction had been made in PDDv2. However the left over paragraph has been removed in the revised PDD v.3	The offending erroneous statement has been removed from the PDD - OK CAR9 is closed out.
CAR 10: The statement "It can [be] considered that heat requirement aspect is already reflected in alternative E1 is not in accordance with the methodology.. Hence only alternative E1 - Power generation using fossil fuels in a captive cogeneration power plant is considered in further steps". is not in accordance with the methodology	6.11	The suggestion has been incorporated in the revised PDD v.2 Second Round Response: The correction had been made in PDDv2. However the left over paragraph has been removed in the revised PDD v.3 The evidence which reflects the fact that cogeneration system is more	The erroneous statement has been removed from the PDD - OK The electricity and heat alternatives now include generation by captured biogas (i.e. H4 and E4).

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		economically attractive than generation in two separate systems has been provided in the revised PDD. http://www.chpcentermw.org/pdfs/Toolbox_TechBrief.pdf and http://www.ifc.org/ifcext/gfm.nsf/AttachmentsByTitle/FMS-EO-EEF-C/$FILE/FMS-EO-EEF-C.pdf The baseline alternatives for heat and electricity generation which reflects the project activity i.e co-firing of fossil fuel and renewable energy has been added in the PDD.	The exclusion of separate generation of electricity and heat in Step 4 due to the higher costs of separate generation compared to co-generation is accepted as reasonable and consistent with the DOE's sectoral knowledge - OK The exclusion of C3 – capture of biogas and then flaring – based on economic unattractiveness compared to using the biogas as energy (C5) is reasonable and accepted. CAR10 is closed out
CAR 11: either (1) remove from Step 3 the economic comparison between the power generation with diesel and coal for H1/E1 and keep the 2 options for further comparison in Step 4; or (2) provide evidences of a prohibitive barrier that would prevent H1/E1 scenarios from using diesel.	6.11 7.5 7.35 7.40	The diesel and coal based generation have been further compared in Step 4 in the revised PDD.	Coal and diesel costs are now discussed in Step 4 – ok. Refer to CL33 CAR 11 is closed out
CAR 12: The start date of the project activity in section C.1.1 is not appropriate as the work order of the steam turbine is not part of the CDM project activity. A description of how this start date has been determined, and a description of the evidence available to support this start date should be provided.	7.1 7.2 7.3 7.12 7.17	As per CDM Glossary of Terms - The starting date of a CDM project activity is the earliest date at which either the implementation or construction or real action of a project activity begins. In light of the above definition, the start date shall be considered to be the date on which the project participant has committed to expenditures related to the implementation or related to the construction of the project activity. Hence as pointed out by the DOE the start date as mentioned in PDD v1 is not correct. The start date of the project activity has been corrected in the revised PDD v.2 to 12th February 2010 when the BOT	Having reviewed the overall context of the project, the BOT can be considered as the credible evidence for determining the starting date of the project activity. This conclusion is based on following aspects: - Both parties (IEI and BEI) are PPs and are

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		agreement was signed between PT. Indonesia Ethanol Industry and PT. Biogas Energy Indonesia. The BOT agreement has been attached herewith.	independent companies. - Both parties are specialised companies in their own operational areas – one in ethanol production and other in developing and running biogas projects. - BOT is a recognised and established legal arrangement for project development and financing mechanism and it is also a recognised financial vehicle in project development in Indonesian law. - BOT is the financial and project development arrangement in this project so both Parties have vested interests and must be under legal obligations for the implementation of the project. Because of the entire argument that BOT arrangement is essential for the implementation of the project and without such arrangements the project can not go

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			ahead makes it a strong case to be a valid evidence for project start date. CAR12 is closed out.
CAR 13: Revise input data and assumptions related to the energy balance of the proposed cogeneration plant (and provide the proper explanations used in the "Investment Comparison Analysis" spreadsheet, presenting all calculations and the rationale in a transparent and traceable way and making sure all parameters are related to the final power generation (1.8 MW). Main parameters that need to be readdressed are: net calorific value of coal, coal consumption (per ton of steam and per year), boiler energy output, steam enthalpy (calculation), steam consumption and turbine energy output.	7.15 7.23 7.24 7.26 7.31 7.32 9.2	As discussed during the site visit the investment comparison analysis sheet submitted to the DOE is correct with respect to energy balance and cogeneration plant. Hence there is no need for revision in this respect as all the calculations are based on 1.8MW power generation capacity. The calculations done in the Investment comparison analysis have been discussed at stretch during the site visit. However as suggested by the DOE to make the worksheet transparent, source for all assumptions have been provided in the revised investment comparison analysis v.2 The supporting documents for the same have been provided to DOE post site visit. The NCV of coal and cost of coal has been corrected in the revised investment comparison analysis v2. The evidence for the same has been attached herewith. The parameters like coal consumption and boiler energy output are based on the technical specification provided by the boiler supplier. The technical specifications have been submitted to DOE during the site visit. Similarly steam consumption and turbine energy output are based on turbine specifications submitted to the DOE during the site visit. The steam enthalpy has been calculated based on the boiler specifications (coal consumption rate and NCV of coal) in the Investment comparison analysis. Please note that the steam enthalpy used in the analysis is based on fuel input so as to take into consideration the boiler efficiency. Hence only the coal NCV and coal price has been revised in the investment comparison analysis v2.	The technical calculations of coal required and coal displaced are now clearer and corrections of NCV of methane have been made. The calculations are all based on 300 days operation per year (7200 hours) of both the boiler and the methane generation from the wastewater. Further evidence to support the assumption of 300 days (7200 hours) operation per year of the ethanol plant has been provided as per the adjacent cell - OK Calculations of coal consumption, boiler energy output, steam enthalpy, steam consumption and turbine energy output are correct and related directly to boiler and turbine specifications – OK NCV of coal has been revised up to 5,900 to reflect the average NCV of coal - OK

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		Second Round Response: The following documents (provided earlier) help justify the 300 days plant operation assumption. • The digester consultant quotation, on the basis of which digester has been designed, which mentions an average 1500 m3/day of wastewater, 300 days of operation and average COD of 85000mg/l • Boiler specification which states 300 days of operation. • EIA report which states the design capacity of ethanol plant is 6tph and the ethanol production planned is 40,000 ton per annum. Hence at design capacity the plant is expected to operate for 278days. Hence 300 days of operation is conservative. The PP is also attaching herewith the relevant page from the ethanol plant feasibility report which reflects the fact that 40,000 MT of ethanol plant is expected to be produced in a year (evidence 54)	CAR 13 is closed out
CAR 14: Provide a proper supporting evidence for the coal price in cell D11, 'Basic Data', "Investment Comparison Analysis".	7.16 7.31 7.32	The coal price has been corrected in the revised in the Investment Comparison Analysis v2. The evidence for the same is attached herewith. Second Round Response: The PP would like to clarify that the plant is still under construction stage and hence the work on long term coal contract has not started. Further the PP would like to clarify that the evidence submitted is appropriate & conservative for the following reasons: 1. The evidence used is published by the most nearest (on the same island) and one of the largest coal mine company in Indonesia. The price assumed reflects the long-term sales contract and that through spot market. This can verified from the company's 2009 Annual report (page 100) which states	The coal price is taken as the average coal price over the last 5 years. This was based on general presentations of one bulk coal supplier in the region. Further evidence has been provided for the coal price in the form of a coal price quotation from a local supplier (DR 39). The price indicated is over 10% higher than that assumed in the investment analysis. This is considered reasonable as an average price over the period as evidence has been provided that

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		'The Company sells coal to domestic and export markets under long-term sales contract and through spot market, while selling price is always based on thermal coal market price. Hence it is very clear that the price assumed refers the coal market price. 2. As mentioned above the cost assumed in the investment comparison analysis includes both spot price and long term price and hence it can be considered that the coal price assumed is higher than what a buyer will pay under long term contract. Hence conservative. 3. Further as can be seen from the evidence the price assumed also includes the transportation cost from the mine to the Taranhan Port which is approximately 400kms away. However the project activity is located mid way between the coal mine and the port. As mentioned in the evidence transportation cost has a share of around 25%-30% of the total cost. Hence it can be assumed that the cost in reality will be lower than that assumed in the investment analysis. Also it would not make financial sense for the PP to buy coal from another island which is a few hundred kilometers away as it would increase the transportation cost substantially. Hence from the above it can be concluded the coal price evidence used is appropriate and conservative. Further even if in the sensitivity analysis the coal price is varied by +/- 50% the additionality argument still holds true.	coal prices fluctuate such that an average price taken over the last 5 years is more accurate of the long-term average. Evidence has also been provided that coal prices have recently 'spiked' and are currently declining (DR 36 -38). Coal price variations are further analysed in the sensitivity analysis. CAR 14 is closed out
CAR 15: Provide clear and transparent breakdown of capital investments and O&M costs for project and baseline scenarios in the "Investment Comparison Analysis" spreadsheet, supplying information in the PDD and proper supporting evidence.	7.16 7.23 7.24 7.31 7.32	The details for the all the input cost (Capex and O&M) have been provided in the revised investment comparison analysis v2 and all the related references/source have been submitted to the DOE. The same details have been incorporated in the revised PDD v2. Second Round Response: As can be seen from both the quotations the cost items and the quantity are the same. The difference lies in the unit price for each cost	Capex of the Project Activity: • The actual contracts and costs incurred as at end November 2010 were provided by the PP for review as supporting evidence of the actual project activity capex costs. It is apparent that actual

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		item. The first quotation only includes the construction cost associated with third party supply of goods and services related to capital goods (Construction Cost).However the second quotation is the cost for a turnkey solution i.e it also includes the cost for resources utilized to manage the project construction like managing construction risk, budget risk and also the administration aspects (like project management, quality control cost, etc) are also included Also as informed earlier it is important to note that the aerobic construction cost and the cost for baseline alternative assumed in the PDD are also turnkey cost. Hence it is more appropriate to use the turnkey solution cost for the Digester. It is important to note that the investment decision was made on the basis of the quotations. Also as per CDM guidelines all the evidences should be before the start date of the project activity. Hence the PP feels quotations can be considered as appropriate evidence. (Also if the PP had already signed a contract for digester then the start date would have been different). As rightly pointed out by the DOE as per Indonesian Regulations the assets are taxed at 10% and services at 13% (10% VAT and 3% WHT). However as can be seen some of the quotations used as evidence for investment analysis includes cost for both assets and services. Further some cost components in the quotations includes both assets and services. Hence some will be taxed 10% and some 13%. For example cost component like Electrical includes both equipment and services. Hence as it is difficult to identify the exact tax amount a uniform 13% tax was assumed earlier. However for conservativeness in the revised investment comparison analysis v3 all the cost components have been uniformly taxed at 10%. The 'Expert Digester Monitoring Cost' can be found in the evidence 'Digester Consultant Quotation' as annex 3. (Please refer the evidence 16 provided to DOE post site visit)	costs will be 8-10% less than the (revised) cost estimated at the time of the investment decision. This is partly due to the avoidance of contingency costs which were implicit in earlier contract costs - OK The revised investment analysis now only applies 10% tax to the capex costs which is conservative - OK Baseline costs: • Documents have been provided and do adequately support the baseline capex cost assumptions (though there are some inconsistencies between Doc 43 and Doc 39c) – OK • The baseline O&M costs assumptions are presented in the Baseline Study Report and are reasonable - OK O&M costs – project activity: • Source documentation has been provided and is ok • The Expert Digester Monitoring Cost is in Appendix 3 of the 'Digester Consultant Quotation' and is consistent and

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		The following link for the assumed USD/IDR exchange rate has been provided in the revised investment comparison analysis v3. http://www.exchangerates.org.uk/IDR-USD-21_12_2009-exchange-rate-history.html The evidence for dismissing scenario C2 has been provided in the revised PDD v.3. http://www.chpcentermw.org/pdfs/Toolbox__TechBrief.pdf and http://www.ifc.org/ifcext/gfm.nsf/AttachmentsByTitle/FMS-EO-EEF-C/$FILE/FMS-EO-EEF-C.pdf	reasonable - OK The USD/ IDR exchange rate is valid. CAR15 is closed out
CAR 16: fix tables 10, 11 and 12 and/or supplied spreadsheets in order to provide consistency between them.	7.22	The deprecation rate and income tax rate have been removed in the revised PDD v2 and Investment Comparison analysis v2 as these values are not used in the analysis. This is because the NPV's for various scenarios are compared on a pre-tax basis.	A pre-tax analysis is ok and more appropriate – OK CAR 16 is closed out
CAR 17: adjust Step 3 in section B.4 of the PDD according to the guidelines of ACM0014, i.e., following Step 3 of the "Tool for the demonstration and assessment of additionality". Make sure all relevant barriers are considered, including those identified in section B.5., and analyzed for all alternatives.	7.33 7.34 7.38 7.40	The barrier analysis in section B.4 and B.5 have been made consistent and in accordance with Step 3 of the 'Tool for the demonstration and assessment of additionality" in the revised PDD v.2.The identified barriers have been analyzed for all alternatives. Second Round Response: The barrier analysis will be removed from PDD The alternative E3 and H3 has been eliminated using prohibitive barriers as per the guidance in the ' Tool for the demonstration and assessment of additionality'. In the revised PDD evidence has been	Section B.4 is now consistent with the Methodology and the Tool for the demonstration of additionality - OK Alternatives E3 and H3 are now dismissed based on technical barriers: It is accepted that renewable energy as a fuel for electricity and/or heat generation at the site is not feasible due to a lack of supply of raw materials

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		provided to for exclusion of solar power plant as a baseline alternative.	and technology. CAR 17 is closed out
CAR 18: adjust Step 3 in section B.5 in order to ensure consistency with the Step 3 developed in section B.4.	7.34 7.38 7.40	The Step 3 in section B.4 and Step 3 in section B.5 have been made consistent in the revised PDD v.2 Second Round Response: The barrier analysis argument has been removed. The common practice section has been reworked in the revised PDD v3.	Barrier analysis has been removed from the PDD. Since financial investment analysis was selected and elaborated in the PDD this is compliant with the Tool and the methodology. CAR18 is closed out
CAR 19: explain the steps followed to determine EFgrid,y.	8.1 8.6 8.11 8.12 9.1	As discussed in the PDD the 'Tool to calculate the emission factor for an electricity system' has been followed to determine the grid emission factor. The letter from the relevant government agency (Environment Ministry) stating the grid emission factor and the calculation sheet are attached herewith. Second Round Response: The DOE rightly says that older version of the tool has been used to calculate the Grid emission factor. However it is important to note that the only difference between the latest version of the tool and the version of tool used by the PP is the inclusion of off-grid power plants in calculation of the Grid EF. However as there is no data available for off-grid system in the Sumatra grid there will be no difference in the grid emission factor value. The same has been clarified in the PDD in section B.6.1	The PP cannot just adopt the government agency determination. This because: – The wrong version of the tool was used; – The choice for geographical area should be justified; – It should be checked and confirmed that the correct vintage of data was used; – It should be justified that the selected method was correct for this project; – Ex ante or ex post needs to be clarified; – It is not clear if all chosen

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		The choice of geographical location is clearly reflected in the sheet 'existing grid sumatera'. As can be seen from the picture the project falls under the Sumatera Grid. The Grid EF has been worked out based on the latest available data. To the best knowledge of PP, data from 2008 onwards are still not available publicly. The application of all the steps of the tool along with justification has already been provided in the Grid EF worksheet. The DOE is request to refer the sheet 'OM & BM'. As has been explained in the sheet 'OM&BM' the ex-ante option has been selected for the ex-ante CER calculation. However the PP understands from ACM0014v3.1 page 16 that the EF for grid will have to calculate every year post registration i.e. ex-post. The PP feels all the chosen steps as described in sheet 'OM&BM' are applicable and in line with the tool. As can be seen from the above explanation the PP feels there is no need to correct the EFgrid calculation. Further it is important to note that with the revision of captive plant EF the grid emission factor is not relevant for ex-ante CER calculation. The emission factor for the captive power plant has been calculated based on the available technical information for ex-ante calculation and as per the 'Tool to calculate baseline, project and/or leakage emissions from electricity consumption'. The same has been incorporated in the revised PDD v.3. Please refer evidence 53 attached herewith.	steps are applicable to this project. The PP should correct and justify the EFgrid determination In addition, the choice between EFgrid and should EFcaptive be justified, since the $EF_{BL,EL,captive}$ determination should be justified, especially the efficiency of the captive power plant since in this stage, the nameplate capacity should already be clear and the EF of the used fuel since local or regional data might be available. With this effort, evidence can be provided that EFgrid was selected correctly. The PP to correct and to develop and justify the EFgrid step by step rather than letting the DOE to assess the third party data. In the second round response, the PP has explained correctly that in this case it makes effectively no change if the correct version of the EF Tool has been used or one version earlier, hence effectively it can be stated that EF determination

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			complies with the latest version. OK. The data used are the latest data at time of submission of the PDD to the DOE which is also OK. The choice between EFgrid and EFcaptive has now been justified, The PDD has been updated accordingly and correctly. CAR19 is closed out.
CAR 20: include explanation about how PEEC,y is determined/calculated.	8.1 8.4	As the baseline emission due to electricity generation/consumption is based on net quantity of electricity generated in year y with biogas from the new anaerobic biodigester i.e. after excluding the electricity consumed by project activity $PE_{EC,y}$ is assumed to be zero. The same has been clarified in section B.6.1 of the revised PDD v.2 Second Round Response: The following statement has been added in the revised PDD section B.7.1 for parameter EGpj,y - The net quantity of electricity generated from biogas is obtained by subtracting the electricity consumed by the project activity	Even if consumed electricity is smaller than produced and the net electricity generated will be determined as explained in the PDD there is still consumption of electricity by the project, which need to be taken into account. The description in he PDD of the EGpj,y does also not take into account that correction for consumed electricity needs to be done. With the added statement in the PDD it is now clear that the consumed electricity by the project activity will be accounted for and only the net quantity will be used in the emission reduction calculations. CAR20 has been solved.
CAR 21: Include the calculation of PEsludge,LA,y in the calculation of PEy in section B.6.1.	8.2 8.11	As discussed during the site visit the PP would like to clarify that a very negligible amount of sludge (mainly perished bacteria) is expected	PP is requested to justify the negligible quantities of sludge and quantify (or estimate

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		which will be de-sludged every 2-3 years. However this has been included in the PDD v.1 as a source of emission which will be monitored. However the emission from land application of sludge has not been accounted currently in section B.6 of PDD as the PP has no estimate about the quantity and quality of sludge. Hence the PP has assumed zero emission from sludge in the current PDD as the emission from sludge is anyways expected to be negligible. The statement "the project activity does not introduce a treatment of sludge" has been removed in PDD v2 as this was an error. Second Round Response: As discussed earlier it is currently difficult to estimate the quantity & quality of sludge as there is no similar precedent available. However based on the digester design it is expected that the sludge quantity will be negligible. However to avoid any doubts the following paragraph has been added in the PDD v3 B.6.1 - 'Negligible amount of sludge is expected to be accumulated in the digester which will be extracted occasionally (every 2-3 years) during the life of the project. Therefore the project emissions from land application of sludge are expected to be negligible. As the plant is still under construction it is not possible to estimate the quality and the quality of sludge that will be generated. Hence for ex-ante emission the emission from sludge is assumed to be zero. However the project will be monitored to ensure that any sludge removed from the digester is measured and will follow Equation 31 in the ACM14v3.1 methodology'. Based on other project under correction request (project no. 2970) the PP feels this approach should be acceptable.	conservatively) the emissions and justify that it is negligible and state this in the PDD. If it is credibly shown that PEsludge,LA,y is negligible it does not need to be included in PEy calculation. Based on the second round response of the PP and the experience of the validation team, it has been made credible that project emissions from sludge from the digester will be negligible and this has now been explained in the PDD. With respect to this it is acceptable to use zero for the ex ante calculations of project emissions and monitor the amounts of generated sludge and calculate the emissions during the project. CAR21 is closed out.
CAR 22: in page 30, the explanation "3.6 = Coefficient for converting to GJ to MWh" should be "3.6 = Coefficient for converting from GJ to MWh".	8.5 8.12 8.13	This has been corrected in the revised PDD v.2 Second Round Response: The relevant paragraph has been removed from the PDD as it is no	It is still stated as: "Coefficient for converting to MWh to GJ" Second round:

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		more relevant now.	Ok, it is removed and not necessary to be included. CAR22 is closed out.
CAR 23: adjust value of CODout,x in B.6.2.	8.12	The CODoutlet has been changed to 1530mg/L in the revised PDD v2. Second Round Response: The typo error has been corrected. The CODout is 689 tCOD/yr	CODout has actually been changed to 135 t/year. Justify this is similar to 1530 mg/L. Second round: It was a typo. Correction made. CAR23 is closed out.
CAR 24: adjust value of CODin,x in B.6.2.	8.12 8.13 9.2	The CODinlet has been changed to 68000mg/L in the revised PDD v2. Second Round Response: The typo error has been corrected. The CODin is 30,600 tCOD/yr	CODinlet has actually been changed to 38,250 t/year. Justify this is similar to 68000 mg/L. Second round: It was a typo. Correction made. CAR24 is closed out.
CAR 25: include the source of the data used for fd and move optional values, adding them to the space "Justification of the choice of data or description of measurement methods and procedures actually applied".	8.12	The suggestion has been incorporated in the revised PDD v.2	OK, has been incorporated. CAR25 is closed out.
CAR 26: fix notation of the used value for fd.	8.12	The notation has been fixed. In the revised PDD v2.	OK, has been fixed. CAR26 is closed out.
CAR 27: fix unit used for D; instead of M, use m.	8.12	The unit has been fixed. In the revised PDD v2.	OK, has been fixed. CAR27 is closed out.
CAR 28: remove the first parameter EFCO2,FF,captive from the list of parameter in B.6.2.	8.12	The parameter description and notation has been corrected in the revised PDD v2.	OK, has been fixed. CAR28 is closed out.

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CAR 29: fix unit of EFCO2,FF,captive to tCO2/GJ	8.12	This has been fixed in the revised PDD v2.	OK, has been fixed. CAR29 is closed out.
CAR 30: convert value according to the proper unit.	8.12	This has been fixed in the revised PDD v2.	OK, has been fixed. CAR30 is closed out.
CAR 31: fix the unit from m2 to ha for A.	8.12	This has been fixed in the revised PDD v2	OK, has been fixed. CAR31 is closed out.
CAR 32: convert value from m2 to ha.	8.12	This has been fixed in the revised PDD v2	OK, has been fixed. CAR32 is closed out.
CAR 33: values should be inputted in tables 21 to 23 and 30 to 31; tables and calculations in Annex 3 should be incorporated in section B.6.3, with the proper indication on how calculations are made.	8.15	The values have been incorporated in Table 21 to 23 and 30 to 31 in the revised PDD v2.This should help understanding how the calculations have been carried out. The PP feels it is better to keep the tables in Annex 3 rather than in B.6.3 for readers convenience.	OK,All values have been inputted. CAR33 is closed out.
CAR 34: recalculate CODavailable,m and CODPJ,available,m considering the generation of wastewater exclusively during the months of operation of the ethanol plant, i.e., distributing the wastewater flow in 10 months.	8.16	It is important to note that although the plant will be running for 300 days the plant will not be shut down for 60 days at a stretch. Further as per AM0014 ver3.1 'The quantity of methane generated from COD disposed to the open lagoon (Scenario 1) or in sludge pits (Scenario 2) depends mainly on the temperature and the depth of the lagoon or sludge pit. Accordingly, the methane conversion factor is calculated based on a factor fd, expressing the influence of the depth of the lagoon or sludge pit on methane generation, and a factor fT,y expressing the influence of the temperature on the methane generation' Further 'In some regions, the ambient temperature varies significantly over the year. Therefore, the factor fT,y is calculated with the help of a monthly stock change model which aims at assessing how much COD degrades in each month' Considering the plan operating condition as explained above and keeping in context the importance of monthly temperature variance in calculating methane conversion factor (as per ACM0014) the PP feels it is more realistic to distribute the CODavailable and CODPJavailable over the full year rather than just 10 months	The clarification in adjacent cell sounds acceptable from the waste water treatment technical point of view. However, this explanation and justification should be provided in the PDD. Furthermore, given this train of thoughts, it raises the doubt if this is consistent with the financial analysis since in there, the financial assumptions are that electricity demand and biogas generation will only be for 300 days per year. The PP now has to justify or correct the assumptions made for financial analysis bearing the here provided explanation in mind. Moreover, from the newly

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		Second Round Response: As discussed in CAR 13 above the ethanol plant is expected to operate approx 300 days over a 12 month period. Thus the total biogas production and energy demand in the financial analysis has been worked out assuming that the plant will operate for 300 days (distributed over 12 months). As the amount of annual coal replaced has been calculated based on total biogas energy generated in a year the PP feels the assumption is the financial analysis needs no correction. The document referred herein by the DOE is for some other ethanol plant in Indonesia (Indolampung). To justify the COD content of wastewater in the project activity the following document s have been submitted to the DOE • The ethanol plant design document (evidence 44) • The digester consultant quotation, on the basis of which digester is being designed, which mentions an average COD of 85000mg/l (evidence 16) • EIA report which states the average COD of wastewater about 85000 mg/l and 1500m3 of wastewater per day (hard copy submitted post site visit)	provided document 49, It appears that COD content may not be as claimed elsewhere in the PDD. Please, justify the COD content with doc 49 in mind. Second round: Now it is explained that the total biogas production and energy demand has been worked out for 300 days /year operation, it is clear that the used number of biogas generated annually had already taken into account the 300 days / year operation of the digester.. CAR34 is closed out.
CAR 35: adjust table 34 in the PDD, including the information for each year.	8.19	The months have been added in the revised PDD v.2	OK, has been fixed. CAR35 has been closed out.
CAR 36: remove parameters FCcoal,y; NCVcoal,y; EGy and NCVBiogas,y from B.7.1 and include CODsludge,LA,y, SLA,y and wN,sludge,y	9.1	As explained in the PDD the boiler used for steam generation (and hence electricity generation) is a co-fired boiler utilizing coal ad biogas. Hence to calculate EG PJ,y the parameters FCcoal,y; NCVcoal,y; EGy and NCVBiogas,y needs to be monitored. The parameters related to sludge emission are already included in	Ok, explanation accepted, but needs to be included in PDD. For parameter CODsludge it is stated that "a representative sample of waste water will be

Corrective action requests (Questions in the report, which refer to a previous raised CAR are not included in this summary and hence this summary can only be used together with the main protocol table)	Reference to checklist question	Summary of project participants' response	Final conclusion
		section B.7.1 of the PDD v.1 Second Round Response: The following explanation has been provided in B.7.1 for EG,PJ,y. 'The total electricity (from coal and biogas) generated is measured daily by an electricity meter. The quantity of electricity generated from biogas will be calculated based on the share of biogas (energy content) in the fuel mix (coal and biogas) going to the boiler. The share of biogas will be calculated based on amount of biogas captured used for heat generation and NCV of biogas as against the total energy input (coal and biogas). The energy content from coal is calculated on the basis of quantity of coal utilized and NCV of coal. The net quantity of electricity generated from biogas is obtained by subtracting the electricity consumed by the project activity.' The parameter COD sludge now states 'A representative sample of sludge will be collected and analysed for COD according to appropriate national or international standards by external laboratory.;	collected". This should be corrected to sludge sample. Second round: The after first round requested corrections have been made in the PDD. CAR36 is closed out.
CAR 37: remove parameter FVRG,h from B.7.1.	9.2	The parameters Fbiogas,y and FVRG,h are different. Fbiogas,y is the total biogas production and FVRG,h is the biogas flared. There may be a situation where the total biogas produced may not be utilized in the boiler and hence may have to be flared. Hence the PP feels monitoring both the parameters is important.	Justification accepted. CAR37 is closed out.
CAR 38: remove value for Tflare.	9.2	The flare temperature has been removed in the revised PDD v.2	Ok. Flare temperature has been removed. CAR38 is closed out.
CAR 39: adjust information for Tflare in B.7.1.	9.2	The error has been rectified in the revised PDD v.2	Ok, error was rectified. CAR39 is closed out.

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CL 1: Include a project timeline indicating the different project implementation milestones in section B.5 of the PDD.	2.2 8.20	The project timeline has been added in the section B.5 of revised PDD v.2 Second Round Response: As per Large Scale PDD guidance - In cases where start starting date of the project activity is before the date of validation project proponents shall provide an implementation timeline of the proposed CDM project activity. The timeline should include, where applicable, the date when the investment decision was made, the date when construction works started, the date when commissioning started and the date of start-up (e.g. the date when commercial production started). In addition to this implementation timeline project participants shall provide a timeline of events and actions, which have been taken to achieve CDM registration, with description of the evidence used to support these actions. These timelines will allow the DOE to assess the serious consideration of the CDM in the project decision making process and project implementation. The PP has tried to provide all the above information. Further the serious CDM consideration can be established from the fact that the gap between start date of project activity and start of validation is less than 2 months. However as suggested by the DOE the date for investment decision, which is also the start date, and the date for EIA approval has been provided in the revised PDD v.3. Milestones like purchase of land, securing of loans, etc are applicable to the ethanol plant and hence may not be relevant to the proposed project activity. Also other milestones like receipt of quotes for key equipment and updates of data/cost estimates may not be relevant in this case as the gap between the start date and start of validation is less than 2 months.	A timeline has been added in the revised PDD. CL 1 is closed out

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		Further based on the 'Guidelines on the demonstration and assessment of prior consideration of the CDM' only projects starting before 2nd Aug 2008 needs to establish that continuous and real action has been taken. As the project has a start date after 2nd Aug 2008 and the UNFCCC notification was sent according to the guidance mentioned above, the PP feels the additional information for establishing the real and continuous action may not be required.	
CL 2: Provide in section A.2 a clear description of the purpose of the project activity with a concise description of the existing, project and baseline scenarios.	3.1 3.2 3.4	As described in section A.2 of PDD v.1 the project activity (and ethanol plant) is a Greenfield project. Hence the land use prior to that plant has been explained in the revised PDD v.2 to further clarify the existing situation. Further it has been clarified in the revised PDD v2 that the scenario explained in the absence of the project activity in PDD v1 is also the baseline scenario. Additional details related to the project scenario has also been provided in the PDD v.2	The project description is now clearer – ok CL2 is closed out
CL 3: Include in A.2 an explanation on how the proposed project activity reduces CH4 emissions making reference to the scenarios, emission sources and gases.	3.1 3.2	The following statement has been added in the revised PDD v2. section A.2 to explain the source of CH4 emission – 'In the absence of project activity the methane emissions from the open lagoons would have been emitted in the atmosphere'	Ok CL3 is closed out
CL 4: include in section A.4.3 a more complete description of the baseline scenario, including all elements required by the PDD_guid04_v07;	4.3 4.6 4.8	The section A.4.3 has been reworked for baseline scenario in accordance with PDD_guid04_v07 in revised PDDv2. Second Round Response: The location of the diagram has been corrected. The stated dimensions of the lagoons in the PDD are consistent with	Figure 2 and Figure 3 in the revised PDD are mixed up – CL The Figures are now correct - OK The dimensions of the baseline lagoon system are consistent with the Baseline Study Report.

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		other evidences provided.	However, it is not clear how the total volume in the PDD has been calculated (with reference to your Doc 39.c Table Scenario 3_rev) Second round: The figures are correct now. By checking PDD and other documents it is concluded that the lagoon dimensions are made clear and are consistent now. CL4 is closed out.
CL 5: Include clear information on the existing scenario.	4.4	The statement in section A.4.3 has been revised in the PDD. The following addition has been made (in bold). The project activity is incorporated as part of the implementation of a new ethanol plant **(Greenfield project) i.e. there is no existing wastewater treatment system**	Ok CL5 is closed out
CL 6: A more detailed description of the project scenario, including all elements required by the PDD_guid04_v07 should be provided;	4.5 4.6 4.7 4.8	The section A.4.3 has been reworked for project scenario in accordance with PDD_guid04_v07 in revised PDDv2. .	The required information has now been provided. CL6 is closed out
CL 7: clarification on the cogeneration plant composition (boiler, steam turbine and generator) and technical specifications is required, including, but not limited to, information on power capacity, steam production capacity, rated working pressure, power and heat	4.5	The cogeneration system has been further described in the revised PDDv.2 with all relevant technical details for boiler, generator and steam turbine. The evidences for same have been submitted to DOE during site visit. Further as explained during the site visit the following clarification has been provided on the difference in energy requirement of plant and	For the cogeneration plant, further and consistent information has now been provided (including DR 72). CL7 is closed out

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generation/consumption, etc. PPs are required to provide evidences, such as the design details of the project relating to the integrated cogeneration unit in order to substantiate the information supplied in the PDD and the assumptions used for the investment analysis and the ER calculations.		turbine capacity 'Please note that in the earlier design the electricity requirement of the ethanol plant was estimated to be around 3MW.However due to certain changes in the ethanol plant design (prior to start date of project activity) the electricity requirement of the ethanol plant was reduced to 1.8MW and the steam requirement to 25TPH. However as the turbine was already ordered the configuration of turbine could not be changed'	
CL 8: provide clearer information on the demand and requirements for training and maintenance requirements of the proposed project activity.	4.10	The details regarding training and maintenance has been provided in section A.4.3 of the revised PDD.v.2	Some further information about training has been provided in the revised PDD. CL8 is closed out
CL 9: Provide evidences regarding the source(s) of funding to the project activity to demonstrate that there is no public funding involved in the project activity.	4.12	As discussed during the site visit PT. Indonesia Ethanol Industry and PT. Biogas Energy Indonesia has signed a BOT contract and the complete project activity will be funded by PT. Biogas Energy Indonesia in the form of pre- payment against future CER's. Hence it is clear that no public funding from Annex I is involved in the proposed project activity. The BOT contract as shared during the site visit is attached herewith	The BOT contract has been provided (DR63). CL9 is closed out
CL 10: provide clear and objective evidences that the project meets the applicability condition "Heat and electricity requirements per unit input of the water treatment facility remain largely unchanged in the baseline scenario and the project activity".	6.4	The PP would like to clarify that the 200KW electricity requirement as mentioned in the CL10 includes the biogas treatment system also. The amount of electricity required by the project activity per unit input of water is 1.41 kWhh/m3 of water. Based on the baseline study report it is estimated that the amount of electricity required in the baseline scenario per unit of water is 0.163 kWh/m3.Hence it can be seen that the electricity requirement change is insignificant compared to the expected renewable electricity from the project activity which is approximately 0.5MW. The justification in the revised PDD v2 has been reworded accordingly. Second Round Response:	The further explanation provided in the revised PDD is correct and adequately proves compliance of the project activity with the Methodology applicability conditions. CL10 is closed out

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		The information has been presented in the revised PDD v.3. The following justification has been provided ' 'There is no heat requirement in the baseline scenario and project activity for wastewater treatment. The amount of electricity required per unit input of water in the project activity and in the baseline scenario is 1.41 kwh/m3 of wastewater and 0.163 kWh/m3 of wastewater respectively. Hence it can be seen that the electricity requirement remains largely unchanged in the project activity and in the baseline scenario and is insignificant compared to the expected renewable electricity from the project activity which is approximately 0.5MW. Also as per ACM0014 v3.1 'If electricity is generated with biogas under the project activity, the electricity consumption for the operation of the project activity should be subtracted from the total on-site electricity generation with biogas in calculating *EGPJ,y* (i.e. *EGPJ,y* only includes the *net* electricity generation resulting from the project activity)'	
CL 11: fix the inclusion/exclusion of N2O emissions from the WW treatment or present a clear justification/explanation for its exclusion. N2O emissions need to be included, according to the methodology.	6.8	The N_2O emission from land application of sludge has been included in Table 6 of the revised PDD v2.	Yes, now included. CL 11 is closed out
CL 12: fix the inclusion/exclusion of CO2 emissions from the electricity use or present a clear rationale for its inclusion.	6.8	The justification for inclusion of CO2 emission from the electricity use has been clarified. Second Round Response: The following additional statement has been added in table 6 – 'The on-site electricity consumption by the digester will be subtracted from the electricity generation of the digester'. This clarifies the fact that the on-site electricity consumption by digester will be subtracted to get the net electricity generation and hence electricity use by digester is included in	This statement and rationale has now been revised in the PDD and is consistent with the Methodology. CL12 is closed out

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		project emission.	
CL 13: include project CO2 emissions from the combustion of propane in the project boundary or justify/explain why it can be considered negligible.	6.8	The propane is normally used as start up fuel. However as the methane concentration in the biogas will be around 55% propane will not be consumed for initial ignition.	Ok, this is clear. Propane is not mentioned in the PDD. CL 13 is closed out
CL 14: include flows of mass and energy and monitoring variables in the diagram.	6.9	The flows of mass and energy have been incorporated in the project boundary diagram. The PP feels as the monitoring variable diagram has been explained in the section B.7.2 of the PDD repeating the same in the section should be avoided. Hence the monitoring variable diagram has not been included in section B.3. Second Round Response: Some additional information has been provided in the project boundary diagram in the revised PDD v3 regarding biogas, flare gas and coal. The emission from N2O has been added in the table 6 of revised PDD v3.	That monitoring variables are presented in B.7.2 only is acceptable. The revisions to the project boundary diagram and Table 6 now show mass and energy flows for biogas, flare gas and coal and N20 emissions from land application of sludge. CL14 is closed out
CL 15: the statement that emissions from land application of sludge are "expected zero but monitored" should be clarified since this is not consistent with the remainder of the PDD.	6.9	As discussed during the site visit the PP would like to clarify that a very negligible amount of sludge (mainly perished bacteria) is expected which will be de-sludged every 2-3 years. However this has been included in the PDD v.1 as a source of emission which will be monitored.	Ok, with explanation as in adjacent cell in the PDD it is clear, consistent and acceptable. CL15 is closed out.
CL 16: provide clarification in the PDD on the reason why the 3 lagoon (WW treatment systems) design options were chosen.	6.11	The purpose of conducting the exercise is to identify the appropriate wastewater treatment alternative for scenario W1 which is 'The use of open lagoons for the treatment of wastewater'. Hence as required by methodology the depth of open lagoon was varied which resulted in wastewater being treated to different level i.e. different COD outlet. To treat this open lagoon effluent it was considered appropriate to have the final stage treatment in either aerobic or anaerobic system depending on	A total of 5 baseline wastewater treatment options are now analysed, including 3 options which apply the same technology (DR23). The financial assessment

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		the COD of the open lagoon effluent. All the options were designed to have similar end result. The PP feels as the purpose is to 'Define various lagoon design options for particular wastewater stream' just varying depth of open lagoons without varying the post lagoon treatment system may not be the most appropriate way to analyze. Hence the PDD v1 provided different open lagoon based wastewater treatment options (in terms of open lagoon depth and process) rather than just providing one treatment system with different lagoon depth i.e same treatment process with different lagoon dpeth. However as suggested by the DOE (as per CAR 5) in the revised PDD, 2 more alternatives have been added which have processes similar to option 3 but different depth . Second Round Response: As rightly pointed out the residual COD content of the 5 options vary from 130 to 270g/m3.However the PP would like to clarify that the purpose of the exercise is to identify a **realistic and plausible design** alternative for open lagoon based wastewater treatment system. It is important to note every option has to discharge wastewater with COD below 300mg/l as per the environment regulation. Hence to avoid any violation of environment regulation it is ensured in the designing that the discharge wastewater has a COD of less than 300mg/l. Further it would be very unrealistic to assume that all the scenarios will treat wastewater just below 300mg/l and nothing less. (That would be theoretical design and not a realistic one). This is because there are instances during which to make the design realistic and in alignment with industry practice the design consultant has rounded certain values e.g. width of open lagoon rounded up to 45m instead of theoretical 44.8m. Hence even though the designer starts with the assumption that the COD level of discharge should be just below 300mg/l there will always be a	undertaken is adequate. The reasoning provided by the PP is clear and sensible with regards to the required volume of the lagoons and the small difference in treatment efficiency. It is noted that the original lagoon design in the original EIA (AMDAL), also presumably prepared by an expert, is vastly different to the Options assessed in the Baseline Study Report (the design in the 2008 AMDAL proposes 6 anaerobic ponds, all larger than the ones proposed in the Baseline Study Report, and a further 4 aerobic ponds). However, it is accepted that the Baseline Design Report is a more detailed and rigorous study and presents more realistic and specific potential wastewater treatment designs. It is noted that the aeration time and thus electricity costs could be adjusted (reduced) in Options 1 and 2 while still meeting the COD regulatory limit. However, given that Options 1 and 2 are almost twice as expensive in NPV terms than Options 3-5, such adjustments and associated

<table>
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<tr><td></td><td></td><td>case where the discharge COD is less than 300mg/l.

Further as can be seen from the table below the difference between required efficiency (for 300mg/l) and design efficiency in various options is less than 0.2%. Further the difference in efficiency between different scenarios is less than 0.15%.Hence the PP feels it's not correct to state that 'the options are not directly comparable'. Also as can be seen option 5 (2nd most cost effective alternative) has less stringent design (treats up 270mg/l) than option 3 (treats upto 229mg/l). Hence conservative.

<table>
<tr><th>Design Specifications</th><th>Unit</th><th>Option 1</th><th>Option 2</th><th>Option 3</th><th>Option 4</th><th>Option 5</th></tr>
<tr><td>Average depth of Anaerobic Lagoon</td><td>M</td><td>4</td><td>5</td><td>6</td><td>4</td><td>5</td></tr>
<tr><td>Discharge COD</td><td>g/m3</td><td>130</td><td>160</td><td>229</td><td>159</td><td>270</td></tr>
<tr><td>COD inflow</td><td>g/m3</td><td>85000</td><td>85000</td><td>85000</td><td>85000</td><td>85000</td></tr>
<tr><td>COD limit</td><td>g/m3</td><td>300</td><td>300</td><td>300</td><td>300</td><td>300</td></tr>
<tr><td>Required COD removal efficiency</td><td>%</td><td>99.6%</td><td>99.6%</td><td>99.6%</td><td>99.6%</td><td>99.6%</td></tr>
<tr><td>Actual efficiency</td><td>%</td><td>99.8%</td><td>99.8%</td><td>99.7%</td><td>99.8%</td><td>99.7%</td></tr>
<tr><td>Difference</td><td></td><td>-0.20%</td><td>-0.16%</td><td>-0.08%</td><td>-0.17%</td><td>-0.04%</td></tr>
</table>

Further as can be seen from the calculations provided in the baseline study report in option 4 the COD of effluent from the 2nd anaerobic lagoon is still very high – 4250 g/m3 as compared to 1530g/m3 and 2720g/m3 in option 3 & 5 respectively. Hence in option 4 the effluent (wastewater) can't be treated directly in the facultative pond after 2nd lagoon. Hence the</td><td>cost reductions would not materially affect the result - OK

CL16 is closed out.</td></tr>
</table>

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		need to have one more open lagoon (3rd). Also due to the addition of one more open lagoon the residence time increase by 6 days. It can be seen from the table above that the difference in overall treatment efficiency between option 3 and option 4 is just 0.09%. This difference can be attributed to the reason discussed in paragraph above i.e. trying to make the design more realistic and in alignment with industry practice and more importantly the environment regulation. Also it is important to note that the difference in returns between option 3 and that 4 is more than 10%. Hence it can be imagined that a 0.09% difference in efficiency cannot impact the returns by more than 10%.	
CL 17: provide technical explanation regarding the assumed organic loading rates and the hydraulic retention times of the anaerobic lagoon design options specifically with reference to the project activity.	6.11	The PP understands that the independent consultant hired by the DOE arrived at the stated organic loading rate while calculating the influent COD as 85,000g/m3, which is the quality of the wastewater before the pre-treatment and not the quality of wastewater that enters the lagoons. As described in the baseline study report the wastewater will be pre-treated before treating it in the anaerobic lagoon. The COD value of the wastewater entering into the lagoon will be 68.000gCOD/m^3. This should be the base value for the calculation of the loading rate. Based on this value the loading rate is still expected to be higher than 1 kgCOD/ m^3.day. However it is important to note that it is still acceptable as the project is located in region where tropical conditions exist. The PP would further like to clarify that the assumptions made for the design are still conservative. In the baseline study report it has been assumed that the treatment efficiency of the anaerobic lagoon is 85% instead of 90 % which is possible according literature referenced in the Baseline Study report. Also a Heat Retention Time of 30 days in the first lagoon is a conservative assumption. Hence the PP feels that a waste water treatment system with a pre-treatment followed by an anaerobic process in open lagoons, as described in the baseline study report is practical and should achieve the	The COD content after pre-treatment of 68,000g/m3 is consistent with the Baseline Study Report (DR23). This value has also been used elsewhere in the PDD. CL 17 is closed out

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		design objective. Also as discussed during the site visit (and also during the meeting with the agency that prepared the baseline design report) the PP would like to highlight the fact that the baseline report has been prepared by PT. Tirtakreasi Amrita, a reputed wastewater solutions company. The company has more than 15 years of experience as an EPC contractor for wastewater solutions in Indonesia and abroad.	
CL 18: adjust the HRT in table 8 or justify the reason for the use of a value in the PDD (38 days) different than the one used in the Baseline Study Report (36 days).	6.11	The HRT as mentioned in the baseline study report (36 days) is correct. The typo error in the PDD has been corrected in the revised PDD v.2	CL 18 is closed out (as per CL16 above)
CL 19: provide evidences for the values used in the cost analysis of the lagoon design options (e.g., land price and excavation cost) and the whole calculation rationale or open spreadsheets.	6.11	The evidences for the land cost and electricity cost has been attached herewith. The worksheets for cost calculations referred in the baseline study report have been attached herewith. (Please refer CAR 8 above). The detail cost break up for all the 5 baseline lagoon scenarios have been provided in the revised PDD v2 Annex 5. Second Round Response: To be conservative the land cost has been assumed to be zero in the revised baseline financial assessment and in the investment comparison analysis. One more reference for electricity cost has been provided here with (evidence 56). As can be seen from the evidence (slide 8) the cost of production for PLN in Lampung was Rp 860/kwh. Hence a selling price (including margin) of Rp 900/kwh has been assumed. Please note that this document is as published by Ministry of Energy and Natural Resources. The DOE rightly states that reliable grid electricity is not available to the PP to meet the ethanol plant requirement (1.8 MW). However the PP would like to clarify that the electricity demand for the wastewater treatment is negligible. As can be seen from the baseline study report the	Spreadsheets showing cost calculations have been provided (DR2). Originally, a land cost of 20,000IDR/m2 is assumed in the assessment of baseline options. Evidence of land cost "including levelling" is provided. This appears to be the cost of preparing land associated with specific works. The source of this information is not clear and is not verifiable (and is not 20,000IDR/m2). It is also not clear if this levelling cost would also apply to land in the project activity or whether it is included in the construction costs already. However, land cost in the revised analysis of the wastewater treatment options is now assumed to be zero which is conservative given that the

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		electricity requirement for Option 3 is just 10kw. Hence just for the sake of simplicity & conservativeness the cost of electricity as supplied by grid was assumed as it's comparatively costly then coal power plant. This has been clarified in the revised PDD v3 Further it is important to note that even in the sensitivity analysis if the cost of electricity is assumed as zero the final result does not change i.e. Option 3 is still the most attractive baseline option.	preferred and selected Baseline Option uses the least land and because the project activity uses more land than the Baseline - OK Evidence for the assumed electricity price has been provided (DR88). However, the source of this evidence is apparently from an audit by the Audit Board undertaken in 2007. The new evidence provided for the electricity price used in the assessment of wastewater treatment options is still obscure. However, it is understood that that electricity currently being used at the site is minimal and not through a commercial contract and so not at commercial rates (so no relevant receipts are available). In any event, the result of the wastewater treatment analysis is not sensitive to the electricity price (even with a 50% variation either way, Option 3 is the cheapest) - OK Also, it is noted that elsewhere in the PDD it is claimed that reliable electricity supply from the grid is not available at the site so electricity would not be supplied by the grid. Also in the baseline situation, the electricity would be

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			supplied by the co-generation unit. However, it is understood that for simplicity the cost of electricity from the grid has been used in the assessment of wastewater treatment options. It is also understood that the result of the assessment and the selection of Option 3 is not affected by the electricity price - OK CL19 is closed out
CL 20: provide evidence referenced in footnote 14 of the PDD in order to substantiate the technological barrier suffered by scenario W3.	6.11	The link for footnote 14 in PDD v1 has been provided in the revised PDD v.2	The reference to the Water Quality Control Handbook is provided as footnote 25. The web link has been accessed and verified by the DOE. This also is consistent with the sectoral knowledge of ERM CVS verification team. CL 20 is closed out
CL 21: Provide evidences regarding the unavailability of natural gas and other fossil fuels for the project activity.	6.11 7.5	The unavailability of natural gas in the region where the project activity is located can be validated from the evidence provided in the PDDv.2. However no suitable evidence could be found to substantiate the fact that CNG and LNG are not available in the region where the project activity is located. Based on the publicly available information floating LNG terminals have been proposed by the relevant government agency. However it is important to note that they were not operational at the time of investment decision for the project activity. http://www.thejakartapost.com/news/2009/09/01/pgn-soon-focus-more-lng-business.html Hence request the DOE to confirm this fact by checking it with their local	It is argued that only coal and diesel are available in the project area. Evidence is provided (DR 22 to show that gas is not available. However, there is a gas transmission line running through south Sumatra. The DOE has researched this pipeline and concluded that it is approx. 50km from the site and so supply is not feasible (DR85). Using LNG is also not feasible

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		counterparts.	due to high costs of such plants and due to distance of supply sources as evidenced opposite – OK CL21 is closed out
CL 22: Provide evidences that support the elimination of alternative scenarios H2, H3, E2 and E3 in Step 3 of the identification of the baseline scenario.	6.11 7.5 7.36 7.37 7.40	The Step 3 of the Identification of the baseline scenario has been modified in the revised PDD v2.The evidences have been provided as footnotes in the revised PDD v.2	Barriers facing E2 (grid) and E3 (renewable) are provided: • E2 grid supply – it is argued that grid supply of electricity in the area is not reliable enough and an article on Kompas.com is provided as evidence (DR 20). This is consistent with the DOE's local knowledge – Ok • E3 – biomass – while biomass does exist in the area, the DOE understands that the generation of electricity using biomass is rare and technically difficult and reliable supply is not assured (DR 21). Generation using biomass represents a different project with different technical issues, risks and technical know-how requirements so it is not a feasible alternative for these investors in this case – Ok

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			• E3 – renewable such as wind and hydro – it is understood and accepted that wind and hydropower sources do not produce the reliable and continuous electric power source that is needed by the factory (there is also limited scope for such investments by this investor at this site) – Ok • H2 – heat with fossil fuels - now the PDD states that this alternative does not face any barriers and it is included in subsequent steps of the analysis – ok • H3 – heat with renewable sources – though not well-worded, it is accepted that as for E3, this option is not feasible due to lack of supply of a reliable biomass fuel source and the difference in the type of investment project required. The typo under H3 (Es instead of H# needs to be corrected) - Ok CL22 is closed out
CL 23: : provide: more information about	7.7	Information regarding the project participant has been provided in the revised PDD version2 section A.2. As the nature of the project activity is	It is agreed that both IEI and BEI

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the structure and the arrangement between IEI and BEI, explaining the arrangement and agreement between these two parties. (e.g., how revenues from electricity and heat are distributed between BEI to IEI)	7.26 9.4	linked by IEI who is providing wastewater and BEI who is managing the project activity, both the parties are included as project participants. This will thus provide the necessary commitment to the successful operation of CDM project. As discussed during site visit and as referred in section 7.7 of the DVR the additionality has been worked out considering the project activity as a whole and analyzing it as a single investment for the wastewater plalt and methane recovery unit. . Hence the distribution of revenue between the two parties may not be of relevance in this case. Second Round Response: The PP would like to clarify that as per the BOT contract both parties will work jointly to treat the wastewater. BEI will invest in the digester. methane capture & flaring whereas IEI will be responsible for treating the wastewater effluent from the digester, meeting the government regulation regarding wastewater discharge limit and utilizing biogas, Some of the clauses in BOT contract which help in validating this fact are - Page 1 paragraph, clause 7.2 on page 9 and clause 12.12 on page 13. To summarize both the parties work jointly to treat the wastewater and capture and utilize methane. Hence it is clear that wastewater treatment and methane recovery are neither completely within the financial boundary of BEI nor IEI. Hence the PP feels it is more appropriate to do financial analysis for the project (methane capture and utilization) rather than doing it for one of the involved parties. Also it is important to note that there are only 2 revenue streams for this project – coal savings and CER's. There is no additional revenue stream. Thus it is important to analyse whether the project as a whole is attractive or not. The internal revenue sharing (of coal savings and CER) between the 2 parties involved is not relevant in this case. The PP hopes the above discussion helps clarifying the project structure	are necessary parties for the project activity and hence it is accepted that both are project participants. It is also agreed that the combination of WWTP plus methane generation facility is to be regarded as one economical entity. However, this is under financial responsibility of BEI. This because BEI has taken the turn key responsibility for the project as a whole (waste water treatment plus methane recovery). Establishment of the agreement (BOT) between two parties recognizes this and set conditions for the financial transactions between them. It can be said that waste water treatment plant and methane recovery facility are within the "financial project boundary." The party engaged with developing the project and investing in it is BEI. The explanation provided in the adjacent cell is clear and the DOE agrees that because the project does not fit within the financial boundary of either party, the project as a whole should be assessed rather than one or other of the parts under the

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		and contractual arrangement between the two parties and also helps clarifying that the approach taken for investment analysis in the PDD is appropriate and consistent with CDM guidelines.	responsibility of each party. CL23 is closed out.
CL 24: Provide evidence to support the appropriateness of the discount rate from commercial banks. What is the rate of interest currently paid by IEI on loans for the factory? Also, what was the DR/ BM used in the ethanol factory's FSR?	7.12	Based on the project structure explained in the revised PDD and taking into account 'Guidelines on the assessment of Investment analysis (version 03) para 13/14 especially 'In the cases of projects which could be developed by an entity other than the project participant the **benchmark** should be based on publicly available data sources which can be clearly validated by the DOE. Such data sources may include local lending and borrowing rates ,equity indices, or benchmarks determined by relevant national authorities' the PP is of the opinion that it is more appropriate to assume a benchmark which is publicly available and applicable to any company doing project similar to project activity. Hence a conservative commercial bank lending rate prevalent at the time of the investment decision has been considered for the investment analysis in the PDD. As mentioned in the revised PDD v2 the discount rate used for the investment analysis is the 12.96% which is conservative. Second Round Response: As rightly pointed out, as per the **Tool for the demonstration and assessment of additionality – '**A company internal benchmark (weighted average capital cost of the company), only in the particular case referred to above in paragraph 5. The project developers shall demonstrate that this benchmark has been consistently used in the past, i.e. that project activities under similar conditions developed by the same company used the same benchmark'. However as both the companies are newly setup there is no past history to substantiate the internal benchmark. Also as discussed above, considering the project structure it is difficult to assume an internal benchmark of one of the parties involved. Hence the PP feels it is more	The source of the DR is accepted as valid and appropriate. However, note that this project **could not be** developed by another entity (as it is connected to the ethanol factory) so an internal DR could be applied if appropriately justified. As per the referenced document in Footnote 17, the average rate for commercial loans in February 2010 was 12.99%. While not exactly 12.96% as applied, it is close enough and the difference is immaterial. CL24 is closed out.

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		appropriate to consider a conservative commercial bank lending rate as a discount rate. As discussed earlier two parties involved i.e. BEI and IEI decided to work together and invest in the proposed project on 12th Feb 2010 by signing the BOT contract. Hence the investment decision is itself the start date. The PP feels all the assumptions and input values are valid at the time of decision making.	
CL 25: Provide previous version of the FSR as evidence to confirm input values used in the investment analysis, which were available by the time of the decision to invest in the project activity.	7.14	In context to the statement made in section 7.14 of validation protocol 'It was explained by the PP during site visit that there was a first version of FSR without the project activity and a second version with the project activity included' The PP would like to clarify that during the site visit it was discussed that first version of EIA did not include the project activity however the final version of EIA included the project activity. Both the version of EIA has been provided to the DOE. Second Round Response: 1. The following documents have been provided earlier as an evidence for daily and yearly amount of wastewater – The digester consultant quotation, on the basis of which digester is being designed, which mentions an average 1500 m3/day of wastewater, 300 days of operation and average COD of 85000mg/l – EIA report which states the average COD of wastewater about 85000 mg/l and 1500m3 of wastewater per day – Boiler specification which states 300 days of operation – EIA report which states the design capacity of ethanol plant is 6tph and the ethanol production planned is 40,000. Hence at design capacity the plant is expected to operate for 278days. Hence 300 days of operation is	This CAR requests confirmation of input values for the investment analysis and which source is used is not relevant as long as it provides credible confirmation. • Evidence for the 300 days of operation and thus yearly volume of wastewater generated is now provided. The FSR of the ethanol factory indicates production rates and a total production of 40,000 t/yr (DR 24) - OK • The evidence provided for the technical assumptions of wastewater volume and COD content is now clearer. Page V-13 of the 2009 EIA (DR 11) confirms the daily wastewater volume and COD content. This is consistent with the Digester design specifications - OK

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		conservative. The PP is also attaching herewith the relevant page from the ethanol plant feasibility report which reflects the fact that 40,000 MT of ethanol plant is expected to be produced in a year (evidence 54). 2. The PP is unable to provide the breakup of the ethanol plant power requirement. However based on the ethanol plant design specification and the EIA report it can be seen that the boiler and power generation capacity is 25tph & 1.8MW respectively. However as can be seen from the sensitivity analysis in the investment comparison analysis v3 even if the energy demand of the plant reduces by 50% the project activity is still financially unattractive as compared to baseline situation. The DOE rightly states that there are certain minor differences between the wastewater conditions as mentioned in the 'Digester construction cost quotation' and the document 'Digester consultant quotation' mainly in the temp of wastewater and the methane concentration. The PP would like to clarify that the document 'Digester consultant quotation' is the latest one (before start date) and also is more conservative (as it assumes higher methane generation) .Also please note that this minor changes have no impact on the overall Capex.(Please note that the Envitech document submitted earlier is no more used in the investment analysis)	Energy demand of the factory: • The capacity of the boiler is clear from the evidence provided. It is understood that the project activity will only supply enough biogas to supply about 30% of the required energy for the boiler (with the deficit provided by coal). As such, even if the ethanol factory demands as little as 30% of the total energy capacity and assumed energy demand, the analysis is not affected - OK • It is understood that the information provided in the more up-to-date document - Digester consultant quotation (DR27) – is the valid source of information for wastewater parameters. The information provided is consistent with data used elsewhere including the investment analysis - OK CL25 is closed out
CL 26: provide proper supporting evidences for the NCV of methane (or adjust value) and required land area for project and	7.15 7.23 7.24	The NCV of methane has been corrected in the Investment comparison analysis v2. For the land area required for the project activity please refer to evidence	Yes, the NCV for methane has been corrected from 34 to 35.9. Land costs have now been

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baseline.	7.26 9.2	10 and 11 submitted. Second Round Response: For conservativeness the land cost has been removed in the revised investment comparison analysis v3.	removed from the analysis and are assumed to be negligible. This is conservative given that the project activity is designed to use more land than the Baseline. Also, land is already owned and available at the site - OK CL26 is closed out.
CL 27: provide evidences and justification that each input value used in all investment analysis would be valid and applicable at the time of the investment decision taken by PPs.	7.17 7.31 7.32	As mentioned in CAR 12 above the PP has corrected the start date of the project activity and hence all the supporting document provided during the site visit are valid except DR32 (coal price in 2009).For the coal price in 2009 the supporting document DR32 has been replaced by another reference document which was valid at the time of investment decision. The original baseline report prepared in 2009 which was later modified in April 2010 to include the scenarios (Option 3 with 4m and 5m lagoon depth) suggested by the DOE during the site visit has been attached herewith. Second Round Response: As discussed earlier two parties involved i.e BEI and IEI decided to work together and invest in the proposed project on 12th Feb 2010 by signing the BOT contract. Hence the investment decision is itself the start date in this case. The PP would like to clarify that the start date mentioned in PDD v1 – 26th Nov 2008 is a mistake. It should have been 12th Feb 2010. However it is important to note that this was a typo mistake and all the evidences submitted to the DOE for assumptions and input values are valid at the time of decision making/start date i.e. 12th Feb 2010.	Changing the start date by more than a year has implications for other data used in the analysis. Input data re cost assumptions were originally taken from, and valid for, before the previous start date (i.e. prior to 26 November 2008). This is more than a year before the actual start date. Second round The PP has provided updated data and input values where applicable. The exchange rate has also been updated to the time of the investment decision. The estimates of key variables such as the capex cost of the project activity and coal prices have been cross-checked against actual data and recent quotations. The typo was corrected. CL 27 is closed out

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		Please note that baseline report referred here is dated Dec 2009 and hence should be applicable.	
CL 28: provide justification why inflation has been applied to O&M costs, but not the coal price.	7.17 7.25	The O&M cost has been corrected by removing inflation and making it consistent with the other parameters. As a discount rate has been used, it is incorrect as well not conservative to include inflation. Hence the inflation parameter has been removed in the revised investment comparison analysis v2.	Inflation has been removed from O&M costs and is thus not included in any parameters. This is consistent – ok CL28 is closed out
CL 29: clarify or modify the term "insistence of bank" in page 23 of the PDD.	7.29	The 'insistence of bank' has been removed in the revised PDD v.2	This statement has been removed – Ok. CL 29 is closed out
CL 30: justify why "coal requirement" or "ethanol production" has not been included in the sensitivity analysis presented in the PDD or include one or both parameters in the analysis presented in the PDD.	7.31 7.32	The coal requirement in the plant is directly dependent on the energy requirement of the ethanol plant. Hence to take into consideration the variation in ethanol plant (production) and its impact on coal requirement the sensitivity analysis for electricity requirement is also provided in the revised PDD v.2	The sensitivity to power plant capacity is assessed and this incorporates power requirement including plant capacity and load factor – ok Sensitivity to methane production has now also been assessed. CL 30 is closed out
CL 31: provide, in a transparent way, the rationale on how the sensitivity analysis has been performed in the provided spreadsheet.	7.31 7.32	The sensitivity analysis has been performed using data tables application of excel. However for convenience and cross checks a separate column 'E' has been provided in all the scenario sheets in Investment comparison analysis v2. By varying the percentage in column E the impact of each parameter on NPV can be known. All the variation parameters are linked to NPV.	The sensitivity analysis demonstrates that the result of the investment comparison is not particularly sensitive to variations in the estimated value of the key variables – OK The coal price has varied greatly over the last 5 years, much more than the 10% variation shown in the sensitivity analysis.

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			However, the DOE notes that even a 50% increase in the coal price does not change the additionality of the project activity. The PP has also explained that the coal prices in 2008/09 were unusually high and represented a sudden peak caused by a supply/demand imbalance. Further evidence of the coal price in 2010 has been provided to prove that coal prices have declined and appear to be returning to 'normal' lower levels. The 2010 coal price is 23% lower than the 2009 price (not 37% higher). (DR 37 and DR 38) – ok Variations in methane production have now also been assessed and demonstrates a lack of sensitivity. CL31 is closed out.
CL 32: provide adopted CER prices and the demonstration of the calculation of the NPV of the project with CER revenues or remove this statement from the PDD.	7.32	The CER price prevailing in last quarter of 2009, approximately $15/CER, as reflected on bluenext website has been assumed in the investment comparison analysis. This has been clarified in the revised PDD v.2 and the revised investment comparison analysis v.2. A separate worksheet for 'project activity with CDM' has been provided in the investment comparison analysis v2.	It is now clear that with CER revenue the project activity would be more attractive than the alternative – OK CL32 is closed out
CL 33: provide proper evidences to support the costs regarding power generation with diesel and coal in Indonesia.	7.35 7.40	Proper evidences to support coal and diesel based power generation has been provided in the revised PDDv.2 For Coal - http://www.delidn.ec.europa.eu/en/relations/TIS2009-part2power.pdf For Diesel - http://isslerhall.org/drupal/content/loans-put-pln-'fast-track'-	It is argued that use of diesel would face financial barriers and that coal use is practiced in this area. The studies referenced in the

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		power http://www.adb.org/Documents/RRPs/INO/40061-INO-RRP.pdf (page 45 of 76) http://en.vivanews.com/news/read/98542-ntb_pln_suffers_rp_3_b_losses Second Round Response: The pdf version of the document referring to the above footnotes has been attached herewith as evidence 52.	adjacent cell, and other references provided (DR 36 - 39) provide an overall cost estimate which is adequate as evidence to support the claim that coal is cheaper than diesel. This claim is consistent with the DOE's sectoral and local knowledge - ok CL 33 is closed out
CL 34: adjust the barrier claim or provide proper explanation or justification on the barrier faced by scenario W3. Additionally, complete the reference on footnote #14 in order to make it more accessible to the reader of the PDD.	7.36 7.37 7.40	Further explanation has been provided to the technological barrier associated with the aerobic wastewater treatment facility in the revised PDD v.2.The following statement has been added 'Moreover aerobic treatment systems are more complicated due to inherent difficulties like oxygen transfer problem, high waste sludge produces and settling problem'. The evidence for the same has been provided as a footnote in the revised PDD v.2. Second Round Response: The link for footnote 26 has been provided in the revised PDD v.3	Footnote 14 is now footnote 25. This has been accessed and validated by the DOE. A new reference, footnote 26, has been provided and validated by the PDD. Sufficient evidence of the technological barrier is now provided and is consistent with the DOE's technical knowledge, CL34 is closed out.
CL 35: provide justification for the claimed Technological Barriers, as well as supporting evidences to substantiate the claim and how the barrier is overcome.	7.36 7.37 7.38 7.39 7.40	The PP would like to clarify on the following explanation provided by the DOE 'It is the understanding of this DOE that technology risks may be associated to the project activity, but the risk associated with the low COD reduction performance of the covered lagoon is also applicable to the baseline scenario (open anaerobic lagoons)'. The technology risk discussed in the PDD with regards to the anaerobic digester tries to highlight the following risk associated with the project	Please refer to "Guidelines for objective demonstration of barriers" from EB50. Also the "Tool" clearly states the effort of assessment and level of evidence needed, which should be complied with.

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		technology 1. It is not as proven a technology as open lagoon. Hence the risk of open lagoon not meeting its design objective is comparatively very less than project technology. 2. In the project technology there are a number of parameters which risk the technology not meeting its design objective. Furthermore all these parameters are dynamic in nature and hence require a constant monitoring i.e the system is at constant risk of not performing to the desired level. 3. In case of any problem with the biogas plant there can be a need to look upon an international expert which may take some time and hence there are always chances that the system may take some time before it reaches the stable condition. However this is not the case with open lagoons as the experts are available at local level. In short, the risk and impacts associated with the project technology are much higher and not comparable to the well proven open lagoon technology. The ERPA between ISSCP and PT Indonesia Ethanol Industry) has been attached herewith. The ownership document of BEI has been provided to DOE during site visit. Second Round Response: The barrier analysis has been removed from the PDD.	Also, in their response to CL17 the PP states that the waste water technology experience is available in Indonesia The PDD demonstrates technological risk but not a technological barrier. Further evidence is required to demonstrate that the technological barrier has prevented similar investments (also, see CL36 re evidence for 'first of its kind' claims) The PDD states that the technological barrier has been overcome due to the additional CER revenue associated with CDM registration. This is a financial consideration and should thus be incorporated in the investment analysis section rather than as a tech barrier. The argument that financing was only secured due to the CDM status of the project seems to be referring to a 'financial barrier' rather than a technological barrier. Evidence to support such a financial barrier, if it exists, is required Second round Barrier analysis has been

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			removed from the PDD - OK CL35 is closed out
CL 36: provide further explanation to justify why the ethanol plant wastewater cannot be compared with other types of wastewater and supply evidences to support the claimed barriers due to prevailing practice.	7.36 7.37 7.39 7.40 7.41 7.42 7.43 7.44 7.45 7.46 7.47	The test results and other evidences which justify that the ethanol plant wastewater is not comparable with palm oil mill and starch are attached herewith. From the comparative analysis provided it can be seen that the wastewater characteristics of ethanol are not comparable with that of starch and palm oil. Second Round Response: The common practice analysis has been revised in PDD v.4 The DOE rightly states that wastewater technology experience is available in Indonesia. However it is important to note that this is only for the conventional wastewater treatment i.e open lagoon and not for the technology used in the project activity. The barrier analysis has been removed from the PDD.	[DR 23] has been provided as confirmation of technological barriers. The source of this information is not clear. Though the information shows differences in characteristics for wastewater from 3 types of industrial processes and feedstock, it is not proven that these differences can justify the statement that treatment technology of these types is structurally different. It seems that the same steps can be used with optimizing for each steps. Also the "Tool" clearly states the effort of assessment and level of evidence needed, which should be complied with. Also, in their response to CL17 the PP states that the waste water technology experience is available in Indonesia Evidence to support the barrier due to prevailing practice – has still not been provided. Evidence to support common practice analysis is limited.

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			Please provide a full list of facilities in Indonesia with similar wastewater facilities. If you think that this list should be reduced to only those facilities of certain capacities and types of wastewater, please make the reasons for this restriction clear with supporting evidence. The supporting evidence as to why some facilities are not similar or comparable should relate to differences in their economic attractiveness (as compared to the project investment detailed in Section B.5). Second round Barrier analysis has been removed from the PDD, which is allowed, since financial investment analysis was undertaken, hence it is compliant with the Tool and the Methodology – ok Common practice analysis has been revised and it now shows the existing similar facilities/technology in the region and explanation is given that there are substantial differences for 3 of them and one is a CDM

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			project. CL 36 is closed out
CL 37: In section B.6.1, specify the application of each methodological procedure to the project activity and provide explanations and justifications on the choices of methodological approaches and default values. Note that the methodology is applicable to different conditions and make considerations to each of them, however the PDD has to indicate which choices were made specifically to the project activity, to several possibilities.	8.2 8.4 8.15	The project specific methodology procedure has been explained in the section B.6.1 in the revised PDD v.2 Second Round Response: The following emissions have been included in the project boundary 1. CH4 emission during wastewater treatment & flaring 2. N2O emission during land application of sludge 3. CO2 emission due to electricity emission by project activity The above emission have included in the PDD as follows : **1.** For methane emissions from effluent from the digester the equation no. 20 to 22 as provided in the ACM0014v3.1 has been used. For emissions related to physical leakage from the digester eq. 30 of ACM0014 v.3.1 has been used. For emission due to flaring the equations from 'Tool to determine project emissions from flaring gases containing methane" have been used. Please note that to further ensure that no environmental impact takes place due to any unforeseen technical problem at the plant it is now planned to install open flares along with enclosed flares. Hence	According to the AM, project emissions to be included depends on the configuration of the project activity and the PP needs to show that all emissions as shown in the project boundary diagram are included in the used equations and calculations. There are several pre-treatment steps before the waste water reaches the CIGAR and the PP provided information that the COD drops from 85,000 to 68,000 mg/l during this process. The PP is requested to justify what happens during these steps and whether or not there are emissions which should be regarded as project emissions.

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		the emissions from flare have been adjusted accordingly. 2. As discussed earlier and as mentioned in the PDD it is currently difficult to estimate the quantity & quality of sludge as the sludge quantity expected is negligible. However to avoid any doubts the following paragraph has been added in the PDD - 'Negligible amount of sludge is expected to be accumulated in the digester which will be extracted occasionally during the life of the project. Therefore the project emissions from land application of sludge are expected to be negligible. As the plant is still under construction it is not possible to estimate the quality and the quality of sludge that will be generated. Hence for ex-ante emission the emission from sludge is assumed to be zero. However the project will be monitored to ensure that any sludge removed from the digester is measured and will follow Equation 31 in the ACM14v2 methodology'. Based on other project under correction request (Project No – 2970) the PP feels this approach should be acceptable. 3. For CO2 emission due to on-site electricity consumption the PP would like to reiterate the fact that the emission reduction will be claimed on the net amount of energy i.e amount of energy generated by biogas minus the electricity consumed by project activity .Hence there is no need to separately calculate the emission due to electricity consumption in the project activity. This is also in alignment with ACM0014v.3.1 page 23 which states - If electricity is generated with biogas under the project activity, the electricity consumption for the operation of the project activity should be subtracted from the total on-site electricity generation with biogas in calculating *EGPJ,y* (i.e. *EGPJ,y* only includes the *net* electricity generation resulting from the project activity).	The PP states "electricity used in project activity is zero" Even though it is subtracted for produced electricity this statement is not true. Emissions from sludge are finally excluded in project emissions and this is inconsistent with other parts of PDD including the project boundary diagram and the gases included in the project activity (CH4 and N2O). As long as inconsistencies exist, this cannot be verified. In Table 27 and calculations, project emissions from flaring is not consistent with explanation in the text that there will be flaring for a certain amount of time. In Table 27 it cannot be stated that electricity consumption during the project is zero. GWP N2O is wrong in table 33. After closure of CLs and CARs related to project and baseline emissions, the DOE will reassess

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		The PP would like to clarify that the pre-treatment steps discussed herein by the DOE are only for baseline scenario. In the case of project activity the wastewater from the ethanol plant will be directly sent to anaerobic digester. Hence the COD of wastewater entering the digester will be 85000mg/l and not 68,000mg/l. This can also be verified from the evidence ' digester consultant quotation' which states that the digester is being designed for an average COD of 85000mg/l (evidence 16) For the DOE comment - 'The PP states "electricity used in project activity is zero" Even though it is subtracted for produced electricity this statement is not true' the PP would like to clarify that the PP has stated that the Project Emission from onsite electricity consumption is zero. This is, as explained above, in alignment with ACM0014v.3.1 page 23 which states - If electricity is generated with biogas under the project activity, the electricity consumption for the operation of the project activity should be subtracted from the total on-site electricity generation with biogas in calculating *EGPJ,y* (i.e. *EGPJ,y* only includes the *net* electricity generation resulting from the project activity). As can be seen from the PDD the PP would like to clarify again that sludge emission has only been excluded for ex-ante emissions. The reason for the same has been explained in point 2 above. The project emission from flaring in table 27 has been made consistent with the other section of the PDD. Please also refer to the explanation in point 1 above. The PP would like to clarify that the Table 27 states - Project emissions	the emission reduction calculations with the verified data. Second round The included emission and gases are correct now. For methane emissions from effluent from the digester, the correct equations have been used. For emission due to flaring the equations from 'Tool to determine project emissions from flaring gases containing methane" have been correctly applied now. Regarding the emissions related to sludge from the digester: see CAR21: Based on the second round response of the PP and the experience of the validation team, it has been made credible that project emissions from sludge from the digester will be negligible and this has now been explained in the PDD. With respect to this it is acceptable to use zero for the ex ante calculations of project emissions and monitor the amounts of

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		from electricity consumption in year y is zero. This is, as explained above, in alignment with ACM0014v.3.1 page 23 which states - If electricity is generated with biogas under the project activity, the electricity consumption for the operation of the project activity should be subtracted from the total on-site electricity generation with biogas in calculating *EGPJ,y* (i.e. *EGPJ,y* only includes the *net* electricity generation resulting from the project activity). Also this means that the meth assumes that electricity consumption for project activity is from biogas which is a renewable source of energy. Hence in any case the project emission from onsite electricity consumption will be zero. As per ACM0014v3.1 page 28 the default value for N_2O GWP is 296 for first commitment period	generated sludge and calculate the emissions during the project. For on site electricity consumption, now the statements in the text part of the PDD and the equations used for net electricity are consistent and it is explained that the **net** electricity produced will be accounted for. In addition it is well explained in the adjacent cell of this remediation table. CL37 is closed out.
CL 38: Identify parameters that will be monitored and indicate values used for ex-ante calculations of project emissions, with proper justification	8.3 8.15	Section B.6.1 has been aligned with the PDD guidance04_07 in the revised PDD v.2. The assumed values for ex-ante calculations and their sources are provided in section B.6.2 and B.6.3 of the PDD.	See CL37. With CL37 closed out, the identification of parameters to be monitored and the indications of values for ex ante calculations has been completed. CL38 is closed out.
CL 39: Explain and justify the values applicable to fd in project emissions.	8.3	The value applicable for fd has been clarified in the revised PDD v.2 section B.6.1	Ok, fd value explained and justified. CL39 is closed out.
CL 40: Explain and justify the assumption "that 55% of residual gas is methane and 45% is nitrogen", in page 34, in the application of Step 1 of the "Tool to	8.3	This is as per the "Tool to determine project emissions from flaring gases containing methane"	The step wise approach from the Tool has been revised in the PDD and now it complies with the"Tool to determine project

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determine project emissions from flaring gases containing methane"			emissions from flaring gases containing methane" CL40 is closed out.
CL 41: clearly demonstrate in section B.6.1 how EFBL,EL,y, and EFBL,EL,captive are determined.	8.4	It has been mentioned in the PDD that as the baseline scenario for electricity is E1, as per methodology for determining $EF_{BL,Ely}$ the lower emission factor between the grid emission factor and the emission factor of the captive power plant will be chosen. To determine grid emission factor - 'Grid emission factor ($EF_{grid,y}$) is calculated as the combined margin (CM) using the method and procedure provided in the "Tool to calculate the emission factor for an electricity system (version 02)". For captive power emission factor the formula as suggested in the ACM0014ver3.1 has been used. Please refer section B.6.2 for the values used for calculation.	The emission factor calculation for captive power plant has not sufficiently been demonstrated and still needs to be clarified. For emission factor grid, see CAR 19. With closure of CAR 19 and further clarification the determinations for EFBL,EL,y, and EFBL,EL,captive are clear now. CL41 is closed out.
CL 42: identify parameters that will be monitored and indicate values used for ex-ante calculations of baseline emissions, with proper justification	8.5 8.15	Section B.6.1 has been aligned with the PDD guidance04_07 in the revised PDD v.2. The assumed values for ex-ante calculations and their sources are provided in section B.6.2 and B.6.3 of the PDD.	Values are provided now. See other CLs CARs which refer to these values. Apart from these CARs, CLs, CL42 is closed out.
CL 43: explain and justify the values applicable to fd in baseline emissions.	8.5	The value applicable for fd has been clarified in the revised PDD v.2 section B.6.1	Ok, has been clarified / justified.. CL43 is closed out.
CL 44: provide proper reference for CODout,x.	8.12	The source has been described clearly in the revised PDD v.2. It now states 'Based on the specifications of the baseline open lagoon system as identified in the baseline study report and as discussed in section B.4 above in accordance with the guidelines provided in ACM0014 v3.1.'	Ok, it is clearly described and referenced. CL44 is closed out.
CL 45: provide proper reference for	8.12	The source has been described clearly in the revised PDD v.2. It now	Ok, it is clearly described and

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CODin,x		states 'Based on the specifications of the baseline open lagoon system as identified in the baseline study report and as discussed in section B.4 above in accordance with the guidelines provided in ACM0014 v3.1.'	referenced. CL45 is closed out.
CL 46: provide justification and evidences to support the expected COD content of 85,000 mg/L of the wastewater from cassava ethanol plants.	8.12	The evidence to justify the expected COD content of 85000 mg/l of the wastewater from the ethanol plant has been attached herewith. Second Round Response: The following evidences have been provided to the DOE to justify the COD of wastewater – The ethanol plant design document (evidence 44) – The digester consultant quotation, on the basis of which digester is being designed, which mentions an average COD of 85000mg/l (evidence 16) – EIA report which states the average COD of wastewater about 85000 mg/l and 1500m3 of wastewater per day (hard copy submitted post site visit)	In adjacent cell it is not specified what the evidence is. Second round response The document 44, ethanol plant design document can be regarded as sufficient justification for the COD content. CL46 is closed out.
CL 47: provide proper reference for D.	8.12	The reference has been revised to 'According to the baseline lagoon design as identified in Step 1 of the section "Procedure for the identification of the most plausible baseline scenario" based on the baseline study report as described in section B.4 above' in the revised PDD v.2	OK, Properly referenced now. CL47 can be closed out
CL 48: justify the use of the value for EFCO2,FF,captive.	8.12	The justification has been reworded in the revised PDD v.2 Second Round Response: The calculation of the emission factor for the captive power plant has been attached herewith as evidence 53.	See CL41 The PP has not yet justified the calculation of this parameter. Once it is shown that the result was correct interpreted, this CL can be closed out. Second round.

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			Document 53 was reviewed and found correct; the use of the value for EFCO2,FF,captive has been satisfactory justified. CL48 is closed out.
CL 49: provide proper justification for the use of Annex 1 of the "Tool to calculate the emission factor for an electricity system" as the source of data and for the chosen value.	8.12	The justification has been reworked in the revised PDD v.2 It now states 'Currently as none of the options suggested by methodology for determining efficiency of power plant is applicable to the project activity a default value of 39% for grid connected power plants (post 2000) has been chosen for ex-ante calculation. For ex-post calculation the nameplate data will be used'. Second Round Response: The calculation of the emission factor for the captive power plant has been attached herewith as evidence 53	Only when real value is not available, the alternative way can be taken. However, with a planning for the project to start in early 2011, it could be expected that currently the power plant has already been ordered and the nameplate data already known. Justification is still necessary. Second round Captive power plant emission actor now has calculated based on the specific situation, which is acceptable. Se also CL48: calculation was concluded to be correct. CL49 is closed out.
CL 50: provide proper reference for D.	8.12	The reference has been reworded in the revised PDD 'Design specification of the baseline open lagoons system based on the baseline study report in accordance with ACM0014 v3.1'	Ok, properly referenced. CL50 is closed out.
CL 51: provide sources and/or transparent calculations for the following parameters: 1) CODout,x; 2) CODin,x; 3) FPJ,dig,m; 4) wCOD,dig,m; 5) EGPJ,y; 6) EFgrid,y; 7) CODPJ,effl,dig,y; 8) CODPJ,effl,lag,y; 9) wCOD,effl,dig,m; 10) FPJ,effl,lag,m; 11)	8.15 8.16 8.17 8.18 9.2	For all the parameters discussed in CL 51 the sources and calculations have been provided transparently in section B.6.1,B.6.2, B.7.1 and in annex 3.Further the spreadsheets for the calculations has been provided to the DOE.. Hence the PP feels the PDD is in accordance with the guidance for section B.6.3 of PDDguid04_07.	Pending closure of other CARs and CLs related to these parameters. The ones that are not being discussed in other CLs and CARs are ok now.

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wCOD,effl,lag,m; 12) Fbiogas,y; 13) wCH4,biogas,y; 14) T2,m. Note that any assumption or consideration has to be fully explained in sections B.6.1, B.6.2 and/or B.7.1 and transparently demonstrated in the calculations of B.6.3.			Other CARs and CLs related to these parameters have been closed, hence CL51 is satisfactory clarified now CL51 is closed out.
CL 52: provide explanation on the evolution of the production of ethanol and wastewater.	8.16	The explanation regarding the evolution of the production of ethanol and wastewater has been discussed in section B.6.4 of the revised PDD v.2	Ok, sufficiently explained. CL52 is closed out.
CL 53: applicable to all the listed parameters that are to be measured (according to requirements of PDD_guid04_v07) – include to each measurable parameter: 1) references to person/entity in charge of measurement; 2) references to industry/international/national standards that are applicable to the measurement procedures; 3) accuracy of the measurement method.	9.2	For all the parameters that will be measured the information regarding instrument type and accuracy and measuring responsibility has been provided in the revised PDDv.2. Further as all the parameters that require testing will be tested externally in a nationally accredited laboratory it is assumed that the lab will follow relevant national or international standard. Second Round Response: The PP would like to clarify that in the above response it meant that the testing will be done by external lab based on international or national standards. The same has been said in the PDD v2 – 'A representative sample of waste water will be collected and analysed for COD according to appropriate national or international standards by external laboratory' The appropriateness of the applied standards and the qualification criteria for the laboratories (e.g. accreditation) will be determined before starting monitoring activities and will be kept consistent over the whole crediting period. The PP hopes this clarifies the issue.	National accreditation of a lab is according their own specified methods, hence accreditation is no guarantee that measurements are done following relevant national or international standards, hence the PP needs to take adequate steps before contracting any laboratory. Please, rephrase in adjacent cell and include in the PDD. Second round The second round clarification provides sufficient guarantee that laboratory selection will be adequate and QA/QC can meet the requirements a sset in the monitoring plan and methodology. CL53 is closed out.

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g. CL 54: provide brief explanation on measurement method for wCOD,dig,m.	9.2	A representative sample of waste water will be collected and analysed for COD according to appropriate national or international standards by external laboratory. This has been clarified in the revised PDD v.2	Ok, well clarified. CL54 is closed out.
d. CL 55: specify source of data for T2,m.	9.2	The source of data for T2,m has been clarified in revised PDD v.2.	Ok, well clarified. CL55 is closed out.
g. CL 56: provide specific information regarding measurement procedures of T2,m (e.g. data collection from external reports from a certain source) and monitoring frequency.	9.2	The source has been added in the revised PDD v.2	Ok, source is clarified. CL56 is closed out.
CL 57: provide proper calculation method for EGPJ,y in B.6.1, demonstration in B.6.3, adjust calculation in the "Investment Comparison Analysis" and "ER Calculation" spreadsheets and proper referencing in B.7.1.	9.2	In respect to DOE's comment that 'The explanation of the method to calculate the net electricity (discounting the electricity consumption by the wastewater treatment facility) generated with the use of biogas is NOT clear. Such method or any other is not addressed anywhere else in the PDD' the PP would like to clarify that this as per methodology ACM0014 which states 'If electricity is generated with biogas under the project activity, the electricity consumption for the operation of the project activity should be subtracted from the total on-site electricity generation with biogas in calculating *EGPJ,y* (i.e. *EGPJ,y* only includes the *net* electricity generation resulting from the project activity).Hence the discounting of electricity consumption. Further regarding the DOE's comment that 'The method should not require any consideration on the use of coal or the total electricity generated' the PP would like to clarify that the boiler is a co-fired boiler (coal & biogas).Hence to determine the net electricity generated from biogas the use of coal and total electricity generated is required. Second Round Response:	The explanation that finally the net electricity is used for the calculations is agreed, but the project activity uses electricity, hence it is not correct to state that this is zero and to finally know net electricity, both the generated and used during project both need to be known and this measured, This is not worded clear or correct and the monitoring system (meters) is not sufficient to meet this requirement. The PP is requested to check the PDD for this issue and make the necessary corrections and to reassess and correct the necessary monitoring equipment for measurement of used and produced electricity during the

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		The PP would like to clarify that the emission from on-site electricity consumption by project activity has been assumed to be zero and not the electricity consumption itself. The following explanation has been provided in B.7.1 for EG,PJ,y in PDD v3. 'The total electricity (from coal and biogas) generated is measured daily by an electricity meter. The quantity of electricity generated from biogas will be calculated based on the share of biogas (energy content) in the fuel mix (coal and biogas) going to the boiler. The share of biogas will be calculated based on amount of biogas captured used for heat generation and NCV of biogas as against the total energy input (coal and biogas). The energy content from coal is calculated on the basis of quantity of coal utilized and NCV of coal. The net quantity of electricity generated from biogas is obtained by subtracting the electricity consumed by the project activity.'	project activity. With this, CL57 is now a CAR. Second round The added clarification makes clear that used electricity on site will be accounted for and agrees that electricity will be used, though emissions from electricity use are zero. CL57 is closed out
g. CL 58: provide brief explanation on measurement method for wCOD,effl,dig,m.	9.2	A representative sample of waste water will be collected and analysed for COD according to appropriate national or international standards by external laboratory. This has been clarified in the revised PDD v.2	Ok, well explained. CL58 is closed out.
CL 59: provide brief explanation on measurement method for wCOD,effl,lag,m.	9.2	A representative sample of waste water will be collected and analysed for COD according to appropriate national or international standards by external laboratory. This has been clarified in the revised PDD v.2	Ok, well explained. CL59 is closed out.
CL 60: adjust calculation method of Fbiogas,y, using MCFPJ,y, and include it in section B.6.1, with full explanations and justifications, and the demonstration of the calculation in section B.6.3, with the proper adjustements in B.6.2 and B.7.1, as needed.	9.2	For exante calculation the expected biogas production of 9,818,182 m3/year has been assumed and the PDD has been revised accordingly.(This is based on the expected methane generation of 18,000m3/day and expected methane concentration of 55% in the biogas). Second Round Response:	The PP is still requested to justify if their approach is conservative compared with use of MCFPJ,y. Second round. According to the elaboration of

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		The Fbiogas has been worked out based on the assumption that 18000m3/day of methane will be generated for 300 days. The MCFPJy has been worked out by assuming fd as 0.7 (for 6m open lagoon) based on ACM0014v3.1 and f_{PJt} as 0.998.For f_{PJt} the COD available for degradation per month has been worked out by diving the total COD available for degradation in year y with 12 (months). This has been done to take into account the impact of varying temperature over the 12 months. The PP feels this approach is realistic and conservative.	the parameter and the expalantion, now it can be concluded that it has been determined according to the methodology with acceptable input values. CL60 is closed out..
CL 61: fix the source of data for wCH4,biogas,y and provide in section B.6.1 the explanation on how this parameter is obtained, with the demonstration of its calculation in section B.6.3.	9.2	The explanation for wCH4biogas has been revised in section B.6.1 and B.6.3 of the revised PDD v.2	Ok, it is clearly explained. CL61 is closed out.
CL 62: PPs have to indicate what type of equipment IS GOING to be used, not just leave it open for different possibilities, as written in the methodology. Adjust and expand the information on wCH4,biogas,y about the measurement methods, in order to make it specific for the project activity.	9.2	The information regarding the measurement procedure and instrument details for monitoring wCH4,biogas has been provided in the revised PDD v.2	Ok, information is provided now. CL62 is closed out.
CL 63: provide clear explanation on how the confidence level will be controlled and met by the measurement methods of wCH4,biogas,y.	9.2	As a continuous analyzer will be used the confidence level aspect is not applicable. The same has been corrected in the revised PDD v.2 Second Round Response: In the revised PDD v3 the following statement has been added - The analyzer needs to be in compliance with national or international standard and calibrated by external party.	Continuous analyzer still has an accuracy and precision and the same statistics do apply. Though the explanation in adjacent cell is not correct, the correction in the PDD is acceptable. Nevertheless, the PP is requested that an accuracy of +/- 3% for this kind of instrument is

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			compliant with accepted national or international standards. Second round response The revised text in the PDD is according to the methodology and acceptable CL63 is closed out
CL 64: provide more information on how IEI and BEI will interact on the activities involving the CDM project.	9.4	BEI will be completely responsible for the day to day monitoring of the project activity for which a CDM monitoring team will be appointed. However considering the structure of the project the team of BEI will work closely with IEI to ensure that the activities are performed as per the monitoring plan. The same has been explained in the PDD.	Ok, well explained in PDD. CL64 is closed out.
CL 65: clarify how power generation data can be correlated to the biogas (CH4) flow or remove this possibility from the MP.	9.6	Under normal operating conditions the biogas will be co-fired with coal in the boiler to generate steam and hence electricity .Hence the output energy from the boiler can be known based on energy content of steam. Further based on past data the boiler fuel input to energy output is known. Hence in the case of any deficiency in the methane flow monitoring data the methane flow can be determined based on boiler energy output, boiler fuel input to energy output and coal input. Second Round Response: The PP would like to clarify that in the above explanation the statement – 'Further based on past data the boiler fuel input to energy output is known' should be 'Further based on historical trend, once the plant starts operation, the boiler fuel input to energy output can be known' Thus based on the historical trend the methane flow data can be calculated conservatively. The PP hopes this clarifies the issue.	In adjacent cell it is argued that this option can be used based on past data of the boiler, but it is a Greenfield project and past data are not available. This explanation cannot be accepted. Second round Now it is clarified that this is anticipated in the future situation. It is satisfactory clarified and in the future, after the project started operation, this way is possible. CL65 is closed out.
CL 66: provide a more complete description	11.1	As per the EIA no negative social impacts are expected because of the	Ok, clarification accepted.

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on the findings and conclusions of the EIA related to the project activity.	11.3 11.4	project activity. For noise pollution all the workers will be provided with personal protective equipments. This has been clarified in the revised PDD v.2. Apart from this not other impacts have been identified during the EIA because of the project activity. The PP would also like to clarify that as per EIA no negative impacts have been identified for air quality due to the project activity. The comparison has been provided to reflect the added benefit of the project activity. However the statement has now been put under brackets to clarify that this is not part of EIA Further it has been clarified in section D.2 of the PDD that **as per EIA** no negative impacts are expected from the project activity.	CL66 is closed out.
CL 67: supply the approved EIA related to the project activity and evidences of its approval by local Indonesian authorities.	11.2 11.4 12.2	The approved EIA (stamped by relevant government authority) has already been provided to the DOE during site visit.	It is the approved EIA for the whole ethanol plant in which the project activity is included. CL67 is closed out.
CL 68: clarify if stakeholders, other than those who attended the meeting, had access to the information regarding the project.	12.2	Projects related documents like EIA, PDD and Gold Standard passport were all made available at the village office and are still available. Hence it can be considered that all the relevant project related information was available to all the stakeholders.	Ok, explanation accepted and also in line with what interviewees told the DOE during the site visit. CL68 is closed out
CL 69: clarify if the predominant male attending public can be considered representative.	12.2	As described in the PDD apart from personal invitation the notice was also posted in Local newspaper and village office regarding the project activity .Hence it can be considered that all the stakeholders (male or female) were given a chance to attend the meeting or send comments.	Ok, accepted explanation. CL69 is closed out.
CL 70: Provide information on how each of the comments received in the stakeholder meeting were taken into account by PPs.	12.3	The details regarding how the comments were received are provided in the revised PDD v.2	Ok, accepted. CL70 is closed out.

Forward Action Requests	Reference to checklist question	Summary of project participants' response	Final conclusion
FAR 1: provide evidences to the DOE, during the verification of the first monitoring period, that measures to properly address concerns regarding CH4 leakage, reported by stakeholders, were taken.	12.4		

Minor Issues	
No minor issues raised	