



VALIDATION REPORT

*FORCED METHANE EXTRACTION
FROM ORGANIC WASTEWATER AT
MANDYA DISTRICT, KARNATAKA
BY M/S. SRI CHAMUNDESWARI
SUGARS LIMITED (SCSL), INDIA*

REPORT No. 2006-9005

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DET NORSKE VERITAS



VALIDATION REPORT

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Approved by: Einar Ternes Director	Organisational unit: DNV Certification, International Climate Change Services
Client: Sri Chamundeswari Sugars Ltd	Client ref.: Mr. Srinivaasan Mahalingam - Managing Director

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Summary:

Det Norske Veritas Certification AS (DNV) has performed a validation of the "Forced methane extraction from organic wastewater treatment at Mandya district, Karnataka by M/s.Sri Chamundeswari Sugars Limited" in India on the basis of UNFCCC criteria for the 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, the simplified modalities and procedures for small-scale CDM project activities and the subsequent decisions by the CDM Executive Board. This validation report summarizes the findings of the validation.

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

In summary, it is DNV's opinion that the project, as described in the project design document of 12 January 2007, meets all relevant UNFCCC requirements for the CDM, is eligible as a category III.H small-scale CDM project activity and correctly applies the approved simplified baseline and monitoring methodology AMS-III.H, version 4. Hence, DNV requests the registration of the "Forced methane extraction from organic wastewater treatment at Mandya district, Karnataka by M/s.Sri Chamundeswari Sugars Limited" as a CDM project activity.

Report No.: 2006-9005		Subject Group: Environment			
Report title: Forced methane extraction from organic wastewater treatment at Mandya district, Karnataka by M/s.Sri Chamundeswari Sugars Limited					
Work carried out by: Praveen Nagaraje Urs, Ramesh Ramachandran					
Work verified by: Kumaraswamy Chandrashekara, Hendriik W. Brinks					
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<i>Table of Content</i>	<i>Page</i>
1 INTRODUCTION	1-1
1.1 Validation Objective	1-1
1.2 Scope	1-1
1.3 Description of Proposed CDM Project	1-1
2 METHODOLOGY	2-2
2.1 Review of Documents	2-4
2.2 Follow-up Interviews	2-4
2.3 Resolution of Clarification and Corrective Action Requests	2-4
2.4 Internal Quality Control	2-4
3 VALIDATION FINDINGS	3-4
3.1 Participation Requirements	3-5
3.2 Project Design	3-5
3.3 Project Baseline	3-5
3.4 Additionality	3-6
3.5 Monitoring Plan	3-7
3.6 Calculation of GHG Emissions	3-7
3.7 Environmental Impacts	3-8
3.8 Comments by Local Stakeholders	3-8
4 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS.....	4-8
5 VALIDATION OPINION	5-10
REFERENCES.....	5-11
Appendix A Validation Protocol	
Appendix B Certificates of Competence	

***Abbreviations***

CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEF	Carbon Emission Factor
CER	Certified Emission Reduction
CH ₄	Methane
CL	Clarification request
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
DNV	Det Norske Veritas
DNA	Designated National Authority
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
MP	Monitoring Plan
MVP	Monitoring and Verification Plan
N ₂ O	Nitrous oxide
NGO	Non-governmental Organisation
ODA	Official Development Assistance
PDD	Project Design Document
SCSL	Sri Chamundeswari Sugars Limited
UNFCCC	United Nations Framework Convention on Climate Change
UASB	Upflow Anaerobic Sludge Blanket



1 INTRODUCTION

Sri Chamundeswari Sugars Ltd has commissioned Det Norske Veritas Certification Ltd. (DNV) to validate the “Forced methane extraction from organic wastewater treatment at Mandya district, Karnataka by M/s.Sri Chamundeswari Sugars Limited” project (hereafter called “the project”). This report summarises the findings of the validation of the project, performed on the basis of UNFCCC criteria for small-scale CDM projects, as well as criteria given to provide for consistent project operations, monitoring and reporting.

The validation team consists of the following personnel:

Mr Praveen Nagaraje Urs	DNV Bangalore, India	Team Leader, GHG auditor
Mr Ramesh Ramachandran	DNV Chennai, India	Sector Expert
Mr. Kumaraswamy Chandrashekara	DNV Bangalore, India	Technical reviewer

1.1 Validation Objective

The purpose of a validation is to have an independent third party assess the project design. In particular, the project's baseline, monitoring plan, and the project's compliance with relevant UNFCCC and host Party criteria are validated in order to confirm that the project design, as documented, is sound and reasonable and meets the identified criteria. Validation is a requirement for all CDM projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of certified emission reductions (CERs).

1.2 Scope

The validation scope is defined as an independent and objective review of the project design document (PDD). The PDD is reviewed against the criteria stated in Article 12 of the Kyoto Protocol, the CDM modalities and procedures as agreed in the Marrakech Accords and the relevant decisions by the CDM Executive Board, including the approved baseline and monitoring methodology AMS-III.H, version 4. The validation team has, based on the recommendations in the Validation and Verification Manual /3/ employed a risk-based approach, focusing on the identification of significant risks for project implementation and the generation of CERs.

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

1.3 Description of Proposed CDM Project

The objective of the proposed CDM project activity by SCSL located at Bharathinagara in KM Doddi village in Karnataka state, India, is capture of methane-containing biogas from wastewater treatment and utilisation along with biomass for generation of clean power.

The project activity involves

- The anaerobic treatment of distillery effluent of SCSL (spent wash) and collection of methane-enriched biogas in a closed digester system
- Combustion of the methane-enriched biogas extracted and captured in a boiler for generation of renewable power in SCSL's sugar plant located at the same premises. The boiler is also fed with available supplementary bagasse as fuel from SCSL's sugar factory.



The biomethanation plant is based on an upflow anaerobic sludge blanket (UASB) technology and is supplemented with an aerobic system for secondary treatment. The spent wash is subsequently utilized for bio composting.

By extracting and capturing methane enriched biogas in the anaerobic digester, the project reduces CH₄ emission that would have otherwise emitted from the open lagoon system. SCSL's power requirements (for the sugar factory and the distillery) currently are mainly met by the existing bagasse-based cogeneration plant, with some supplements in off-season from diesel generators and to some degree electricity from the grid. Since a major component of the heat and electricity requirements are met from the bagasse-fired cogeneration plant of SCSL sugar factory, emission reductions due to the displacement of fossil fuel by generation of steam and electricity using biogas has not been taken into account.

Provided that all conditions related to the project occur, the project activity is likely to result in 34 424 tCO₂e annual emission reductions during the ten year fixed crediting period chosen.

2 METHODOLOGY

The validation consists of the following three phases:

- I A desk review of the project design and the baseline and monitoring methodology
- II Follow-up interviews with project stakeholders
- III The resolution of outstanding issues and the issuance of the final validation report and opinion.

In order to ensure transparency, a validation protocol was customised for the project, according to the Validation and Verification Manual /3/. The protocol shows in transparent manner criteria (requirements), means of verification and the results from validating the identified criteria. The validation protocol serves the following purposes:

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

The validation protocol consists of three tables. The different columns in these tables are described in Figure 1.

The completed validation protocol for the "Forced methane extraction from organic wastewater treatment at Mandya district, Karnataka by M/s.Sri Chamundeswari Sugars Limited" is enclosed in Appendix A to this report.

Findings established during the validation can either be seen as a non-fulfilment of validation protocol criteria or where a risk to the fulfilment of project objectives is identified. Corrective action requests (CAR) are issued, where:

- i) Mistakes have been made with a direct influence on project results;
- ii) Validation protocol requirements have not been met; or
- iii) There is a risk that the project would not be accepted as a CDM project or that emission reductions will not be certified.



The term Clarification may be used where additional information is needed to fully clarify an issue.

Validation Protocol Table 1: Mandatory Requirements for CDM Project Activities			
Requirement	Reference	Conclusion	Cross reference
The requirements the project must meet.	Gives reference to the legislation or agreement where the requirement is found.	This is either acceptable based on evidence provided (OK), a Corrective Action Request (CAR) of risk or non-compliance with stated requirements or a request for Clarification (CL) where further clarifications are needed.	Used to refer to the relevant checklist questions in Table 2 to show how the specific requirement is validated. This is to ensure a transparent Validation process.

Validation Protocol Table 2: Requirement Checklist				
Checklist Question	Reference	Means of verification (MoV)	Comment	Draft and/or Final Conclusion
The various requirements in Table 1 are linked to checklist questions the project should meet. The checklist is organised in seven different sections. Each section is then further sub-divided. The lowest level constitutes a checklist question.	Gives reference to documents where the answer to the checklist question or item is found.	Explains how conformance with the checklist question is investigated. Examples of means of verification are document review (DR) or interview (I). N/A means not applicable.	The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached.	This is either acceptable based on evidence provided (OK), or a Corrective Action Request (CAR) due to non-compliance with the checklist question (See below). A request for Clarification (CL) is used when the validation team has identified a need for further clarification.

Validation Protocol Table 3: Resolution of Corrective Action Requests and Requests for Clarification			
Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
If the conclusions from the draft Validation are either a Corrective Action Request or a Clarification Request , these should be listed in this section.	Reference to the checklist question number in Table 2 where the Corrective Action Request or Clarification Request is explained.	The responses given by the project participants during the communications with the validation team should be summarised in this section.	This section should summarise the validation team's responses and final conclusions. The conclusions should also be included in Table 2, under "Final Conclusion".

Figure 1: Validation protocol tables



2.1 Review of Documents

The PDD /1/ dated 12 January 2007 (and its earlier versions) submitted by SCSL and additional background documents related to the project design and baseline calculation data, local stakeholder's comments and the monitoring plan were reviewed as a part of the validation.

2.2 Follow-up Interviews

On 17 January 2006, DNV performed interviews with project stakeholders to confirm selected information and to resolve issues identified in the document review. Representatives of SCSL were interviewed. The main topics of the interviews are summarised in Table 1.

Table 1 Interview topics

Interviewed organisation	Interview topics
SCSL	• Further clarifications that the project activity itself is not a likely baseline scenario due to the existence of one or more of the following barriers: investment barriers, barriers due to prevailing practice or other barriers. • Clarifications on establishment of baseline, monitoring plan and emission reduction calculations • Resources, training needs and procedures for operation and maintenance • Monitoring methodology

2.3 Resolution of Clarification and Corrective Action Requests

The objective of this phase of the validation was to resolve any outstanding issues which needed to be clarified for DNV's positive conclusion on the project design. The corrective action requests and requests for clarification raised by DNV, presented to the project participants in DNV's draft validation report of 2006-9005 (rev.0) were resolved during communications between SCSL and DNV. To guarantee the transparency of the validation process, the concerns raised and responses given are documented in the validation protocol in Appendix A.

2.4 Internal Quality Control

The draft validation report including the initial validation findings underwent a technical review before being submitted to the project participants. The final validation report underwent another technical review before requesting registration of the project activity. The technical review was performed by a technical reviewer qualified in accordance with DNV's qualification scheme for CDM validation and verification.

3 VALIDATION FINDINGS

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



The final validation findings relate to the project design as documented and described in the revised and resubmitted project design documentation.

3.1 Participation Requirements

The project activity is being proposed as a unilateral project by Sri Chamundeswari Sugars Limited located in K M Doddi of Karnataka state, India, which is the only project participant. The host country India meets all the requirements for participating in a CDM project. The DNA of India approved the project on 3 March 2006. The DNA of India has provided confirmation that the project assists in achieving sustainable development

3.2 Project Design

The project activity involves treatment of the spent wash of the distillery unit of SCSL located in Bharathinagara in KM Doddi village, Karnataka state, India. The project consists of two biogas digesters for anaerobic treatment of spent wash and the UASB technology has been adopted for the same. The technology uses an anaerobic method for treating wastewater, resulting in methane generation. The system is designed to capture the methane generated and use it as fuel for heat and power generation. The project activity extracts and captures biogas through the use of anaerobic digesters that would have otherwise been emitted into the atmosphere from the existing open lagoon system. It has been confirmed that the open lagoon system (depth more than 2 meters) was in compliance with the existing environmental regulations. The project activity hence avoids methane emissions from the untreated and semi-treated waste water. The technology is deemed as good current practice.

The project also involves the combustion of the methane-enriched biogas extracted and captured in a boiler for generation of renewable power in SCSL's sugar plant located in the same premises. SCSL's power requirements (for the sugar factory and the distillery) are mainly met by the existing bagasse-based cogeneration plant, with supplements in off-season from diesel generators and to some degree electricity from the grid. Since a major component of the heat and electricity requirements are met from bagasse-fired cogeneration plant of SCSL sugar factory, emission reductions due to the displacement of fossil fuel by generation of steam and electricity using biogas has not been taken into account.

The real action of the project started in June 2005 and the lifetime of the project is expected to be 25 years from the commissioning of the project. A fixed crediting period of 10 years starting from the date of registration of the project activity has been selected.

The validation did not reveal any information that indicates that the project can be seen as a diversion of ODA.

3.3 Project Baseline

The project applies the approved small-scale methodology AMS-III.H, version 4 for methane recovery in wastewater treatment. The project is within the eligibility requirements of the baseline methodology since the estimated annual emission reductions from the project activity is 34 424 tCO₂e, which is less than the stipulated 60 000 tCO₂e limit of the methodology. The baseline for the project activity is selected as per option (vi) of para 6 of AMS III H/Version 04 which is, "the existing anaerobic wastewater treatment system without methane recovery for the



case of introduction of a sequential anaerobic wastewater treatment system with methane recovery”.

The chosen baseline methodology is applicable as the project activity involves methane recovery from the bio-digesters and use of the recovered methane along with biomass for power generation. By extracting and capturing methane enriched biogas in the anaerobic digester the project reduces CH₄ emission that would have otherwise emitted from the open lagoon system.

Open lagoon systems represent the prevalent mode of wastewater treatment in India and would have been the continued option for SCSL in the absence of the project activity. Moreover, the project activity is not mandated by any law, and it has been confirmed that the open lagoon system was in compliance with the existing environmental regulations prior to implementation of the activity. Thus, in the baseline scenario, the spent wash treatment would have been lagoon based wastewater treatment, which would have resulted in methane escaping to the atmosphere. Hence, for the proposed CDM project activity, baseline emissions are CH₄ emissions from wastewater treatment systems.

3.4 Additionality

The project proponent has used the barrier analysis for demonstrating the additionality of the project. Investment barrier and technological barrier have been discussed to demonstrate that the project activity is not a likely baseline scenario.

Investment Barrier:

SCSL has had to invest approximately INR 37 million for the project activity of biomethanation. Calculations have been presented and verified by DNV which show that the internal rate of return (IRR) for the project activity is 8%, which was not attractive enough to proceed with the project on a business-as-usual basis. The returns from the project, which result from the revenue generated from the utilization of biogas based on bagasse saved per year, are not sufficient for the project to be viable by itself. The IRR determined at 8% is below the acceptable IRR in India (at 16%) and SCSL's expectations. In DNV's opinion, the assessment of the IRR by the project proponent is justified and is based on the following facts:

- DNV was able to confirm the investment analysis and the IRR's determined there-in through the detailed spreadsheet calculations forwarded by the project proponent.
- The analysis presented also considers all the applicable benefits for the project activity.

Technology barrier:

Availability of UASB biodigester technology was scarce in India at the time of the project activity conception. Moreover, SCSL was lacking in sufficient skilled manpower and had no expertise in identifying and/or implementing biogas measures within its own operation. SCSL staff had to be trained by the technology provider in operation, maintenance, trouble shooting and monitoring of the UASB-based anaerobic digestion plant. Thus as opposed to the easier approach of opting for continued operation of open lagoon based waste water treatment, SCSL has opted for the additional efforts and risks associated with the implementation of the project activity.

It has also been established that there are 9 distilleries attached to sugar mills in the state of Karnataka, of which only Ugar Sugars and Bannari Amman Sugars Limited have the UASB



process for treatment of spent wash. This demonstrates that the treatment of spent wash through UASB process is not a common practice in Karnataka.

The following evidences were provided to prove that CDM was considered prior to the start of the project activity:

- Participation of company personnel in CDM seminars organized by Winrock International
- Communications from the Indian Sugar Mills Association on the prospects of GHG projects in the sugar industry
- Interactions with CDM consultants in 2004.

The investment barrier, technological barrier and prevailing practice barrier is deemed adequate to prevent the implementation of the project activities without the benefits from CDM.

3.5 Monitoring Plan

The project correctly applies the monitoring methodology AMS-III.H. Emission reductions will be measured by monitoring the following parameters:

- Amount of wastewater entering the wastewater treatment plant (anaerobic lagoons in the baseline scenario and into the digesters in the project scenario)
- Chemical oxygen demand (COD) of the untreated and treated wastewater
- Flow rate of biogas measured continuously
- CH₄% in biogas, measured continuously on daily basis
- Power consumptions in the wastewater treatment facility

The above monitoring indicators will give opportunity for real measurements of achieved emission reductions. Details of the data to be collected, the frequency of data recording, format and storage type are described. Algorithms and formulae used are clearly presented and the calculations are without errors.

Annual regulatory requirements will be monitored. The DNA of India does not require monitoring of sustainable development indicators.

Detailed project management and monitoring procedures, including procedures for QA/QC of monitoring reports are described and found to be adequate.

3.6 Calculation of GHG Emissions

The emissions due to the project result from methane emissions through inefficiency of the wastewater treatment and presence of degradable organic carbon in treated wastewater; methane emissions from the decay of the final sludge generated by the treatment systems; methane fugitive emissions through inefficiencies in capture and flare systems; methane emissions resulting from dissolved methane in the treated wastewater effluent; and electricity consumption due to the project activity. The electricity required for the running of the equipments will be imported from the grid. All emissions from the project activity have been accounted for. There is no leakage involved in this project activity.

Project emission due to the methane emissions from the decay of the final sludge generated by the treatment systems has been considered to be zero. This is because in the project activity, this sludge would be mixed with pressmud and treated wastewater and subjected to aerobic



composting. Since the sludge is processed through aerobic methods, the sludge would not degrade anaerobically and hence there would be no emissions. This is deemed justified. IPCC default values have also been used appropriately such as for CFEww (capture and flare efficiency of methane recovery and combustion equipment), B0, ww (the methane generation capacity of the treated wastewater) and MCFww, treatment (the methane correction factor for the wastewater treatment system). For estimating the project emissions due to the electricity used for running the equipment, the emission factor (latest data) for the southern regional grid – as reported and published by the Central Electricity Authority of India and based on the combined margin approach shall be used (<http://cea.nic.in/planning/c%20and%20e/Government%20of%20India%20website.htm> - Baseline Carbon Dioxide Emission Database Version 1.1 – LATEST).

The estimation of the baseline emissions have been projected from the influent flow to the waste water treatment facility and COD concentration in the influent and effluent. The emission reductions are measured directly ex-post as a product of the waste water treated, COD, methane producing capacity of the wastewater, methane correction factor and global warming potential of methane. For the methane producing capacity of waste water, IPCC default value of 0.21 ton CH₄ / ton COD has been considered. This is considered acceptable and conservative. Displaced emissions due to decreased use of diesel generators and reduced import of electricity from the grid is not taken into account.

3.7 Environmental Impacts

It has been verified that the project did not require an environmental impact assessment. The project has no negative impact on the environment and there are no transboundary effects due to the project. The project has received all necessary environmental licences from the relevant state pollution control board.

3.8 Comments by Local Stakeholders

The local stakeholders of the project have been consulted through a public meeting held on 17 October 2005 at the company premises. The stakeholder groups identified for this project are the local community, Government officials, NGOs, pollution control board, the technology provider and the equipment suppliers. A summary of the comments received has been provided to DNV. The project did not receive any adverse comments from the local stakeholders

4 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS

The PDD of 3 October 2005 was made publicly available on DNV's climate change website (www.dnv.com/certification/climatechange) and Parties, stakeholders and NGOs were through the CDM website invited to provide comments during a 30 days period from 23 November 2005 to 22 December 2005.

One comment was received on 8 December 2005. The comment received (in unedited form) is given in the below text box.

Following SCSL decision to adopt AMS III.H for the project activity, revised PDD (version 5, dated 12 January 2007) was hosted for a period of 30 days from 24 January 2007 to 22 February 2007. No comments were received this time.



Comment by: Anupam Desai, Consultant

Inserted on: 2005-12-08

Subject: Sri Chamundeswari Sugars Ltd.

Comment: Setting up of a Bioreactor is a statutory requirement for all distilleries in India. It is compulsion on part of the stake holders to setup bio methanation facilities for the distillery.

I therefore wonder if this would meet the criteria and qualify as a CDM project. However many companies violate pollution control norms for lack of funds and under such situations I believe they can qualify for CDM projects. As they would not be setup otherwise. CDM would be an incentive.

SCSL response:

Setting up of bioreactor is not a statutory requirement for all distilleries in Karnataka state. Open anaerobic lagoons followed by composting with organic wastes like pressmud is an accepted method of disposal by environmental statutory authorities.

DNV response:

Open lagoon systems represent the prevalent mode of wastewater treatment in India and would have been the continued option for SCSL in the absence of the project activity. DNV confirms that the project activity is not mandated by any law and that the open lagoon system was in compliance with the existing environmental regulations prior to implementation of the activity. Thus, in the baseline scenario, the spent wash treatment would have been lagoon based wastewater treatment, which would have resulted in methane escaping to the atmosphere.



5 VALIDATION OPINION

Det Norske Veritas Certification Ltd. (DNV) has performed a validation of the “Forced methane extraction from organic wastewater treatment at Mandya district, Karnataka by M/s.Sri Chamundeswari Sugars Limited”. The validation was performed on the basis of UNFCCC criteria for the Clean Development Mechanism and host country criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

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

The host country is India. No Annex I country has yet been identified. India fulfils the CDM participation criteria and has approved the project and authorized the project participants. The DNA from India has confirmed that the project assists in achieving sustainable development.

The project correctly applies the simplified baseline and monitoring methodologies AMS-III.H version 4.

By avoiding methane emissions from open lagoons and utilising the captured bio-gas in boilers as fuel for steam and power generation, the project results in CO₂ emission reductions that are real, measurable and give long-term benefits to the mitigation of climate change. It is demonstrated that the project is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity.

The emission reductions from the project are estimated to be 34 424 tCO₂e emission reductions per year during the ten year fixed crediting period chosen. The emission reduction forecast has been checked and is deemed likely that the stated amount is achieved given that the underlying assumptions do not change.

Adequate training and monitoring procedures have been implemented.

In summary, it is DNV’s opinion that the project, as described in the project design document of 12 January 2007, meets all relevant UNFCCC requirements for the CDM, is eligible as category III.H small-scale CDM project activity and correctly applies this methodology. Hence, DNV requests the registration of the “Forced methane extraction from organic wastewater treatment at Mandya district, Karnataka by M/s.Sri Chamundeswari Sugars Limited” project as a CDM project activity.



REFERENCES

Documents provided by the project proponent that relate directly to the project:

- /1/ SCSL: CDM PDD for Forced methane extraction from organic wastewater treatment at Mandya district, Karnataka by M/s.Sri Chamundeswari Sugars Limited, version 5, dated 12 January 2007 and its previous versions
- /2/ Host country approval letter, dated 3 March 2006

Background documents related to the design and/or methodologies employed in the design or other reference documents:

- /3/ International Emission Trading Association (IETA) & the World Bank's Prototype Carbon Fund (PCF): *Validation and Verification Manual*. <http://www.vvmanual.info>
- /4/ AMS-III.H, version 4, dated 23 December 2006.

Persons interviewed during the validation, or persons who contributed with other information that are not included in the documents listed above:

- /5/ Mr Srinivasan – Managing Director, SCSL
- /6/ Mr Murugesan – Project Manager, SCSL
- /7/ Mr Ilango Bharathi – Consultant, Bunge India

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APPENDIX A

CDM VALIDATION PROTOCOL

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

Requirement	Reference	Conclusion	Cross Reference / Comment
1. The project shall assist Parties included in Annex I in achieving compliance with part of their emission reduction commitment under Art. 3	Kyoto Protocol Art.12.2	OK	Table 2, Section E.4.1
2. The project shall assist non-Annex I Parties in achieving sustainable development and shall have obtained confirmation by the host country thereof	Kyoto Protocol Art. 12.2, CDM Modalities and Procedures §40a	OK	Table 2, Section A.3
3. The project shall assist non-Annex I Parties in contributing to the ultimate objective of the UNFCCC	Kyoto Protocol Art.12.2.	OK	Table 2, Section E.4.1
4. The project shall have the written approval of voluntary participation from the designated national authority of each party involved	Kyoto Protocol Art. 12.5a, CDM Modalities and Procedures §40a	OK OK	DNA approvals from India shall be evidenced. Approval dated 3 March 2006 has been evidenced
5. The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change	Kyoto Protocol Art. 12.5b	OK	Table 2, Section E
6. Reduction in GHG emissions shall be additional to any that would occur in absence of the project activity, i.e. a CDM project activity is additional if anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the registered CDM project activity	Kyoto Protocol Art. 12.5c, CDM Modalities and Procedures §43	OK	Table 2, Section B.2
7. In case public funding from Parties included in Annex I is used for the project activity, these Parties shall provide an affirmation that such funding does not result in a diversion of official development assistance and is separate from and is not counted towards the financial obligations of these Parties.	Decision 17/CP.7, CDM Modalities and Procedures Appendix B, § 2	OK	No public funding involved in the project
8. Parties participating in the CDM shall designate a national authority for the CDM	CDM Modalities and Procedures §29	OK	DNA of India: National Clean Development Mechanism Authority,

Requirement	Reference	Conclusion	Cross Reference / Comment
			Ministry of Environment and Forests
9. The host Party and the participating Annex I Party shall be a Party to the Kyoto Protocol	CDM Modalities §30/31a	OK	India ratified Kyoto Protocol on 26 August 2002
10. The participating Annex I Party's assigned amount shall have been calculated and recorded	CDM Modalities and Procedures §31b	Annex I Party has not yet been identified	The project is being proposed as a unilateral project
11. The participating Annex I Party shall have in place a national system for estimating GHG emissions and a national registry in accordance with Kyoto Protocol Article 5 and 7	CDM Modalities and Procedures §31b	Annex I Party has not yet been identified	The project is being proposed as a unilateral project
12. Comments by local stakeholders shall be invited, a summary of these provided and how due account was taken of any comments received	CDM Modalities and Procedures §37b	OK	Table 2, Section G
13. Documentation on the analysis of the environmental impacts of the project activity, including transboundary impacts, shall be submitted, and, if those impacts are considered significant by the project participants or the Host Party, an environmental impact assessment in accordance with procedures as required by the Host Party shall be carried out.	CDM Modalities and Procedures §37c	OK	Table 2, Section F
14. Baseline and monitoring methodology shall be previously approved by the CDM Executive Board	CDM Modalities and Procedures §37e	OK	Table 2, Section B.1.1 and D.1.1
15. Provisions for monitoring, verification and reporting shall be in accordance with the modalities described in the Marrakech Accords and relevant decisions of the COP/MOP	CDM Modalities and Procedures §37f	OK	Table 2, Section D
16. Parties, stakeholders and UNFCCC accredited NGOs shall have been invited to comment on the validation requirements for minimum 30 days, and the project design document and comments have been made publicly available	CDM Modalities and Procedures §40	OK	The PDD has been published on DNV's Climate Change website. Parties, stakeholders and NGOs were through the UNFCCC CDM website invited to provide comments on the

Requirement	Reference	Conclusion	Cross Reference / Comment
			validation requirement during a period of 30 days from 23 November 2005 to 22 December 2005. One comment was received. Following the PP's decision to adopt AMS-III.H for the project activity, revised PDD (version 5) was hosted for a period of 30 days from 24 January 2007 to 22 February 2007. No comments were received.
17. A baseline shall be established on a project-specific basis, in a transparent manner and taking into account relevant national and/or sectoral policies and circumstances	CDM Modalities and Procedures §45c,d	OK	Table 2, Section B.2
18. The baseline methodology shall exclude to earn CERs for decreases in activity levels outside the project activity or due to force majeure	CDM Modalities and Procedures §47	OK	Table 2, Section B.2
19. The project design document shall be in conformance with the UNFCCC CDM-PDD format	CDM Modalities and Procedures Appendix B, EB Decision	OK	

Table 2 Requirements Checklist

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
A. General Description of Project Activity <i>The project design is assessed.</i>					
A.1. Project Boundaries <i>Project Boundaries are the limits and borders defining the GHG emission reduction project.</i>					
A.1.1. Are the project's spatial (geographical) boundaries clearly defined?	/1/	DR/I	The project activity is located in the existing premises of Sri Chamundeswari Sugars Ltd., Bharathinagara, in KM Doddi village, Maddur Taluk in Mandya district in the state of Karnataka, India.		OK
A.1.2. Are the project's system (components and facilities used to mitigate GHGs) boundaries clearly defined?	/1/	DR/I	The project boundary covers the pre-treatment facility, UASB reactor, GLSS, gasholders, boilers and turbines and all related accessory equipments for power generation. The project boundary also includes the grid from where the power is withdrawn. However, the PDD does not address details with respect to the pre-treatment facility and power generation facilities.	GL-1	OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
A.2. Technology to be employed <i>Validation of project technology focuses on the project engineering, choice of technology and competence/ maintenance needs. The validator should ensure that environmentally safe and sound technology and know-how is used.</i>					
A.2.1. Does the project design engineering reflect current good practices?	/1/	DR	Yes, the project design engineering reflects good practices through the use of UASB and GLSS technology for the anaerobic decomposition activity.		OK
A.2.2. Does the project use state of the art technology or would the technology result in a significantly better performance than any commonly used technologies in the host country?	/1/	DR/I	The project has employed UASB technology for anaerobic treatment of the spent wash. However, the PDD does not address the following: • The technology supplier of the UASB technology and whether the same would be imported? • Details with respect to the steam and power generation because of the utilisation of biogas from the project activity.	GL-2	OK
A.2.3. Is the project technology likely to be substituted by other or more efficient technologies within the project period?	/1/	DR	The project technology is unlikely to be substituted by other more efficient technologies, at least not during the crediting period of the project activity		OK
A.2.4. Does the project require extensive initial training and maintenance efforts in order to work as presumed during the project period?	/1/	DR/I	As the project activity is a new initiative for SCSL, training and maintenance needs have not been addressed in the PDD	GL-3	OK
A.2.5. Does the project make provisions for meeting	/1/	DR	Same as A.2.4	GL-3	OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
training and maintenance needs?					
A.3. Contribution to Sustainable Development <i>The project's contribution to sustainable development is assessed.</i>					
A.3.1. Is the project in line with relevant legislation and plans in the host country?	/1/	DR	The proposed project is a voluntary initiative by SCSL. There are no regulatory requirements related to installation of anaerobic reactors for the sugar industry. The project otherwise complies with all the relevant rules & regulations of India.		OK
A.3.2. Is the project in line with host-country specific CDM requirements?	/1/	DR	Approval from the DNA of India shall be provided to demonstrate that the project is in line with the with host-country specific CDM requirements.	CAR-1	OK
A.3.3. Is the project in line with sustainable development policies of the host country?	/1/	DR	Same as A.3.2	CAR-1	OK
A.3.4. Will the project create other environmental or social benefits than GHG emission reductions?	/1/	DR	Yes, the proposed project activity provides benefits such as additional employment generation, ensuring environmental well-being and contributing to resource and energy conservation.		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
B. Project Baseline <i>The validation of the project baseline establishes whether the selected baseline methodology is appropriate and whether the selected baseline represents a likely baseline scenario.</i>					
B.1. Baseline Methodology <i>It is assessed whether the project applies an appropriate baseline methodology.</i>					
B.1.1. Is the baseline methodology previously approved by the CDM Executive Board?	/1/	DR	Yes, the project applies the methodology AMS-III.H, version 4 - <i>Methane recovery in waste water treatment</i>		OK
B.1.2. Is the baseline methodology the one deemed most applicable for this project and is the appropriateness justified?	/1/	DR	The project is a methane recovery project activity involving anaerobic treatment of spent wash from the sugar mill. The project activity fulfills the following applicability criteria as stipulated in AMS-III.H - The project activity involves the introduction of a sequential stage of wastewater treatment with methane recovery and combustion, with or without sludge treatment, to an existing wastewater treatment system without methane recovery as per option (vi). - The estimated annual emission reductions of the project activity are 34.424 ktCO₂e which is less than 60 kt CO₂e..		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
B.2. Baseline Determination <i>The choice of baseline will be validated with focus on whether the baseline is a likely scenario, whether the project itself is not a likely baseline scenario, and whether the baseline is complete and transparent.</i>					
B.2.1. Is the application of the methodology and the discussion and determination of the chosen baseline transparent?	/1/	DR/I	Baseline scenario has been defined as the continuation of methane emissions that would have been released without the implementation of the project activity. However, it is apparent that bagasse was used for power generation in the pre-project scenario and the company was self sufficient in power (no grid power was being used). If this is the case, it is not clear how grid power use can be considered as the baseline for the project activity, as addressed in the PDD. Detailed power consumption pattern (DG power & grid power) for the last three years shall be provided.	CAR-2	OK
B.2.2. Has the baseline been determined using conservative assumptions where possible?	/1/	DR	As in B.2.1 The basis of determining the baseline plant COD values of 145 kg/m ³ and flow of 148 500 m ³ /year have not been systematically included in the PDD so as to conclude on its conservativeness	CAR-2, GL-4	OK
B.2.3. Has the baseline been established on a project-specific basis?	/1/	DR	Yes, the project activity consisting of installation of dedicated anaerobic digesters facility and baselines established		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			are relevant to this project activity.		
B.2.4. Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies, macro-economic trends and political aspirations?	/1/	DR	In India there are no regulations pertaining to mandatory installation of closed anaerobic digesters technology.		OK
B.2.5. Is the baseline determination compatible with the available data?	/1/	DR	As in B.2.1 and B.2.2	CAR-2, CL-4	OK
B.2.6. Does the selected baseline represent the most likely scenario among other possible and/or discussed scenarios?	/1/	DR	The only baseline scenario discussed is the continuation of the existing methane emissions without any closed extraction facility.		OK
B.2.7. Is it demonstrated/justified that the project activity itself is not a likely baseline scenario?	/1/	DR	The project developer has demonstrated the additionality of the project activity through the investment and technology barriers: Investment Barriers: It has been argued that IRR of the project is 8% without the CER revenues and the same improves to 22% with the revenue from the sale of the CER's Technology barrier: It has been argued that UASB treatment facilities involve high maintenance cost because of choking of anaerobic reactors due to the presence of suspended solids in the waste water to be treated. However the following shall be addressed / provided to conclude on the additionality of the project: - Detailed IRR calculations accounting for all the variables addressed (with and without CDM benefits). - Current practices for organic	CL-5	OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			wastewater treatment in India / state of Karnataka should be discussed, and it should be established that similar anaerobic digestion as proposed for the project activity does not constitute a common practice. Where this technology is already in use, a difference in circumstances must be shown to exist and documented. This shall be done by addressing: ○ How many sugar mills / distilleries in Karnataka have UASB reactors? ○ Is SCSL the first mill to adopt UASB reactors? It needs to be proved that this facility is not common practice at least in Karnataka, if not in India		
B.2.8. Have the major risks to the baseline been identified?	/1/	DR	No major risks to the baseline are foreseen.		OK
B.2.9. Is all literature and sources clearly referenced?	/1/	DR	All literature and sources are clearly referenced.		OK
C. Duration of the Project/ Crediting Period <i>It is assessed whether the temporary boundaries of the project are clearly defined.</i>					
C.1.1. Are the project's starting date and operational lifetime clearly defined and reasonable?	/1/	DR	The starting date of the project is 1 June 2005 and the expected operational lifetime of the project is 25 years.		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
C.1.2. Is the assumed crediting time clearly defined (renewable crediting period of seven years with two possible renewals or fixed crediting period of 10 years with no renewal)?	/1/	DR	The project applies for a fixed crediting period of ten years with the starting date to be from the date of registration of the project activity. This needs to be revised to a date post registration of the project activity.	CL-6	OK
D. Monitoring Plan <i>The monitoring plan review aims to establish whether all relevant project aspects deemed necessary to monitor and report reliable emission reductions are properly addressed ((Blue text contains requirements to be assessed for optional review of monitoring methodology prior to submission and approval by CDM EB).</i>					
D.1. Monitoring Methodology <i>It is assessed whether the project applies an appropriate baseline methodology.</i>					
D.1.1. Is the monitoring methodology previously approved by the CDM Executive Board?	/1/	DR	Yes, the project applies the approved monitoring methodology AMS-III.H, version 4 - <i>Methane recovery in waste water treatment</i>		OK
D.1.2. Is the monitoring methodology applicable for this project and is the appropriateness justified?	/1/	DR	The project activity fulfills all the applicability criteria as stipulated in AMS-III.H, as the project involves forced methane extraction from the wastewater of the sugar mill.		OK
D.1.3. Does the monitoring methodology reflect good monitoring and reporting practices?	/1/	DR	Monitoring parameters proposed in the PDD are fully consistent with AMS-III.H		OK
D.1.4. Is the discussion and selection of the monitoring	/1/	DR	Yes		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
methodology transparent?					
D.2. Monitoring of Project Emissions <i>It is established whether the monitoring plan provides for reliable and complete project emission data over time.</i>					
D.2.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for estimation or measuring the greenhouse gas emissions within the project boundary during the crediting period?	/1/	DR	All relevant data necessary for the estimation or measuring the GHG emissions within the project boundary have been included in the monitoring plan.		OK
D.2.2. Are the choices of project GHG indicators reasonable?	/1/	DR	Yes		OK
D.2.3. Will it be possible to monitor / measure the specified project GHG indicators?	/1/	DR	Yes		OK
D.2.4. Will the indicators give opportunity for real measurements of project emissions?	/1/	DR	Yes		OK
D.2.5. Will the indicators enable comparison of project data and performance over time?	/1/	DR	Yes		OK
D.3. Monitoring of Leakage <i>It is assessed whether the monitoring plan provides for reliable and complete leakage data over time.</i>					
D.3.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining leakage?	/1/	DR	There are no specific leakages to be considered for this project activity as per the AMS-III.H		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
D.4. Monitoring of Baseline Emissions <i>It is established whether the monitoring plan provides for reliable and complete project emission data over time.</i>					
D.4.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining baseline emissions during the crediting period?	/1/	DR	Yes monitoring plan has been provided for in line with the requirements of AMS-III.H		OK
D.4.2. Is the choice of baseline indicators, in particular for baseline emissions, reasonable?	/1/	DR	Yes		OK
D.4.3. Will it be possible to monitor / measure the specified baseline indicators?	/1/	DR	Yes		OK
D.4.4. Will the indicators give opportunity for real measurements of baseline emissions?	/1/		Yes		OK
D.5. Monitoring of Sustainable Development Indicators/ Environmental Impacts <i>It is checked that choices of indicators are reasonable and complete to monitor sustainable performance over time.</i>					
D.5.1. Does the monitoring plan provide the collection and archiving of relevant data concerning environmental, social and economic impacts?	/1/	DR	The DNA of India does not require the monitoring of sustainable development indicators.		OK
D.6. Project Management Planning <i>It is checked that project implementation is properly prepared for and that critical arrangements are addressed.</i>					
D.6.1. Is the authority and responsibility of project	/1/	DR	Authority and responsibility for project	CAR-3	OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
management clearly described?			management has not been clearly addressed in the PDD.		
D.6.2. Is the authority and responsibility for registration, monitoring, measurement and reporting clearly described?	/1/	DR	Authority and responsibility for registration, monitoring, measurement and reporting has not been clearly addressed in the PDD.	CAR-3	OK
D.6.3. Are procedures identified for training of monitoring personnel?	/1/	DR	No procedures have been identified	CAR-3	OK
D.6.4. Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	/1/	DR	No procedures have been identified	CAR-3	OK
D.6.5. Are procedures identified for calibration of monitoring equipment?	/1/	DR	No procedures have been identified	CAR-3	OK
D.6.6. Are procedures identified for maintenance of monitoring equipment and installations?	/1/	DR	No procedures have been identified	CAR-3	OK
D.6.7. Are procedures identified for monitoring, measurements and reporting?	/1/	DR	No procedures have been identified	CAR-3	OK
D.6.8. Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)	/1/	DR	No procedures have been identified	CAR-3	OK
D.6.9. Are procedures identified for dealing with possible monitoring data adjustments and uncertainties?	/1/	DR	No procedures have been identified	CAR-3	OK
D.6.10. Are procedures identified for review of reported results/data?	/1/	DR	No procedures have been identified	CAR-3	OK
D.6.11. Are procedures identified for internal audits of GHG project compliance with operational requirements where applicable?	/1/	DR	No procedures have been identified	CAR-3	OK
D.6.12. Are procedures identified for project performance reviews before data is submitted	/1/	DR	No procedures have been identified	CAR-3	OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
for verification, internally or externally?					
D.6.13. Are procedures identified for corrective actions in order to provide for more accurate future monitoring and reporting?	/1/	DR	No procedures have been identified	CAR-3	OK
E. Calculation of GHG Emissions by Source <i>It is assessed whether all material GHG emission sources are addressed and how sensitivities and data uncertainties have been addressed to arrive at conservative estimates of projected emission reductions.</i>					
E.1.Project GHG Emissions <i>The validation of ex-ante estimated project GHG emissions focuses on transparency and completeness of calculations.</i>					
E.1.1. Are all aspects related to direct and indirect GHG emissions captured in the project design?	/1/	DR	Methane emissions from lagoons and emissions due to the use of power for running the digester auxiliary equipment have been appropriately considered.		OK
E.1.2. Are the GHG calculations documented in a complete and transparent manner?	/1/	DR	Yes.		OK
E.1.3. Have conservative assumptions been used to calculate project GHG emissions?	/1/	DR	Yes		OK
E.1.4. Are uncertainties in the GHG emissions estimates properly addressed in the documentation?	/1/	DR	No uncertainties are foreseen		OK
E.1.5. Have all relevant greenhouse gases and source categories listed in Kyoto Protocol Annex A been evaluated?	/1/	DR	Yes, primarily CO ₂ and CH ₄		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
E.2.Leakage <i>It is assessed whether there leakage effects, i.e. change of emissions which occurs outside the project boundary and which are measurable and attributable to the project, have been properly assessed and estimated ex-ante.</i>					
E.2.1. Are potential leakage effects beyond the chosen project boundaries properly identified?	/1/	DR	Not applicable as per the approved baseline and monitoring methodology AMS-III.H.		OK
E.3.Baseline Emissions <i>The validation of ex-ante estimated baseline GHG emissions focuses on transparency and completeness of calculations.</i>					
E.3.1. Have the most relevant and likely operational characteristics and baseline indicators been chosen as reference for baseline emissions?	/1/	DR	Emission reductions due to methane captured in the project which is utilized as fuel to generate electricity have been accounted		OK
E.3.2. Are the baseline boundaries clearly defined and do they sufficiently cover sources and sinks for baseline emissions?	/1/	DR	Yes		OK
E.3.3. Are the GHG calculations documented in a complete and transparent manner?	/1/	DR	As in B.2.1	CAR-2	OK
E.3.4. Have conservative assumptions been used when calculating baseline emissions?	/1/	DR	As in E.3.3	CAR-2	OK
E.3.5. Are uncertainties in the GHG emission estimates properly addressed in the documentation?	/1/	DR	As in E.3.3	CAR-2	OK
E.3.6. Have the project baseline(s) and the project emissions been determined using the same	/1/	DR	As in E.3.3	CAR-2	OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
appropriate methodology and conservative assumptions?					
E.4.Emission Reductions <i>Validation of ex-ante estimated emission reductions.</i>					
E.4.1. Will the project result in fewer GHG emissions than the baseline scenario?	/1/	DR	The lowest figure between ER_CH4 ex-ante and ER_CH4 ex-post is to be adopted for emissions reduction determination. This is not apparent in the PDD.	CL-7	OK
F. Environmental Impacts <i>Documentation on the analysis of the environmental impacts will be assessed, and if deemed significant, an EIA should be provided to the validator.</i>					
F.1.1. Has an analysis of the environmental impacts of the project activity been sufficiently described?	/1/		An assessment of the impacts for the proposed project has been undertaken, though a formal EIA is not required under Indian law for such projects.		OK
F.1.2. Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved?	/1/	DR	As the project is below INR 500 million and as per the EIA notification, a formal EIA with approval from the Ministry of Environment & Forests is not required.		OK
F.1.3. Will the project create any adverse environmental effects?	/1/	DR	No adverse environmental impacts are expected from this project. The waste water from the digesters is mixed with press mud, waste slurry from sugar mill and aerobically composted to produce organic compost. This is also practised by the unit as evident during the field visit.		OK
F.1.4. Are transboundary environmental impacts considered in the analysis?	/1/	DR	No transboundary environmental impacts are applicable.		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
F.1.5. Have identified environmental impacts been addressed in the project design?	/1/	DR	As in F.1.1		OK
F.1.6. Does the project comply with environmental legislation in the host country?	/1/	DR	Evidences of valid Air and Water Consents, issued by the KSPCB shall be provided.	CL-8	OK
G. Stakeholder Comments <i>The validator should ensure that a stakeholder comments have been invited and that due account has been taken of any comments received.</i>					
G.1.1. Have relevant stakeholders been consulted?	/1/	DR	The stakeholders identified for the project activity are the local community, KSPCB, Bharathinagara Gram Panchayat, SCSL employees and the technology provider.		OK
5.1.1 Have appropriate media been used to invite comments by local stakeholders?	/1/		The PDD does not address as to: 1. What were the communications processes adopted for intimation/consultation of the stakeholders. 2. When/where was the meeting held? 3. Summary of the comments received and action taken	CL-9	OK
G.1.2. If a stakeholder consultation process is required by regulations/laws in the host country, has the stakeholder consultation process been carried out in accordance with such regulations/laws?	/1/	DR	Indian regulation does not require stakeholder consultation for projects such as the project activity.		OK
5.1.2 Is a summary of the stakeholder comments received provided?	/1/	DR	As in G.1.2	CL-9	OK
G.1.3. Has due account been taken of any stakeholder comments received?	/1/	DR	As in G.1.2	CL-9	OK

Table 3 Resolutions of Corrective Action and Clarification Requests

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
CAR 1: Approval from DNA of India shall be provided.	A.3.2, 3.3	DNA Approval is attached.	Letter of approval by the DNA of India, dated 3 March 2006 has been verified. CAR is closed
CAR 2: Baseline scenario has been defined as the continuation of methane emissions that would have been released without the implementation of the project activity. However, it is apparent that bagasse was used for power generation in the pre-project scenario and the company was self sufficient in power (no grid power was being used). If this be the case, it is not clear how grid power use can be considered as the baseline for the project activity, as addressed in the PDD. Detailed power consumption pattern (DG power & grid power) for the last three years shall be provided	B.2.1, E.3.3	SCSL uses power from following sources: i. captive bagasse based generation, ii. diesel generator (DG) power and iii. grid power The details of captive bagasse based power generation plant are given in revised PDD in section A.2. A diesel generator set of 1000 KVA (750 kW) is provided to supply electricity during off season when bagasse is not available. Consumption of DG power and grid power for two years, since installation of DG set) is attached as Annexure I. Although grid connection is available, grid power is not preferred for operation due to fluctuations in power quality. However, some grid power is consumed. The average grid power for the last two years is 892.5 MWh. Since the quantum of grid electricity consumed is very less, the displacement of grid electricity is not considered for	Revised PDD now addresses the baseline to be diesel generation power and not the grid power. Though, grid power has been consumed, it has been verified to be in only in cases of emergency. Hence, the project activity no longer addresses grid power as the baseline. It is also confirmed from the revised PDD that since the major component of the heat and electricity requirements are met from bagasse, a biomass, emission reductions by generation of steam and electricity using biogas due to displacement of fossil fuel is not taken into account for conservatism. CAR is closed.

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
		estimation of emission reductions as a conservative estimate. Therefore emission reductions due to displacement of grid electricity are not claimed. Since now only replacement of DG power is considered, the emission factor calculations for the grid is not applicable now. The quantity of diesel consumed for diesel generator (DG), electricity generated from DG and electricity consumed from the grid are attached as Annexure I.	
CAR 3: The operation and management structure does not detail the following: • authority and responsibility for registration, monitoring, measurement and reporting • procedures identified for training of monitoring personnel • procedures identified for calibration of monitoring equipment • procedures identified for maintenance of monitoring equipment and installations • identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation) • procedures identified for dealing with possible monitoring data adjustments and	D.6.1-6.13	Same has been addressed in detail in Section D.4 in the revised PDD version 02.	Complimentary information provided has been verified and accepted. CAR is closed.

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
uncertainties - procedures identified for review of reported results/data - Procedures for internal audit of GHG, performance reviews and corrective actions. - Procedures for potential emergency preparedness for cases where emergencies can cause unintended operations/environmental impacts?			
CL 1: The PDD does not address boundary details with respect to the pre-treatment facility and power generation facilities	A.1.2	The pre-treatment facilities and power generation facilities are addressed in detail in section A.2 and in B.3 in revised PDD version 02.	Revised PDD has been verified and incorporates details with respect to the pre-treatment and power generation facilities. Clarification request is closed.
CL 2: The PDD does not address the following: The technology supplier of the UASB technology and whether the same would be imported? Details with respect to the steam and power generation because of the utilisation of biogas from the project activity	A.2.2	Technology supplier: United Envirotech Pvt. Ltd, Pune, India. Technology is indigenous and not imported. Same has been mentioned in Section A.4.3 of revised PDD version 02 The details with respect to steam and power generation because of the utilisation of biogas are given in section A.2	Complimentary information provided has been accepted. Clarification request is closed.
CL 3: As the project activity is a new initiative for SCSL, training and maintenance needs have	A.2.4, 2.5	Training and maintenance are now addressed in revised PDD in section D.4.	Training and maintenance have been addressed in the revised PDD and considered appropriate.

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
not been addressed in the PDD			Clarification Request is closed.
CL 4: The basis of determining the baseline plant COD values of 145 kg/m ³ and flow of 148 500 m ³ /year have not been systematically included in the PDD. This is necessary in order to conclude on its conservativeness.	B.2.2	<u>COD value</u> Maximum value : 150 kg /m ³ Minimum value : 140 kg/m ³ Average value: 145 kg /m ³ has been considered for design and estimation purposes. COD shall be monitored as per monitoring methodology and actual values shall be used for calculation of emission reductions during monitoring. <u>Flow</u> Designed capacity of the plant: 600 m ³ /day Maximum flow at present : 500 m ³ /day Minimum flow : 400 m ³ /day. An average value of 450 m ³ /day has been considered for estimation of baseline emissions. For a conservative working days of 330 days in a year, the total flow /year is 148 500 m ³ /year. However, flow will be measured as per monitoring methodology for estimation of emission reductions of the project activity.	The basis of determining the baseline plant COD values and flow has now been addressed and is considered acceptable. Clarification request is closed.
CL 5: The following shall be addressed / provided to conclude on the additionality of the project: Detailed IRR calculations accounting for all the variables addressed (with	B.2.7	Detailed IRR calculations with and without CDM benefits are attached There are 9 distilleries attached to sugar mills in Karnataka state of which only	Detailed IRR calculations have been provided and verified. It has also been verified that only two other distilleries attached to sugar mills have adopted the UASB process, thus establishing

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
and without CDM benefits) - Current practices for organic wastewater treatment in India / state of Karnataka should be discussed and it should be established that similar anaerobic digestion as proposed for the project activity does not constitute a common practice. Where this technology is already in use, a difference in circumstances must be shown to exist and documented. This shall be done by addressing: - How many sugar mills / distilleries in Karnataka have UASB reactors? - Is SCSL the first mill to adopt UASB reactors? It needs to be proved that this facility is not common practice at least in Karnataka, if not in India		Ugar Sugars and Bannari Amman Sugars Ltd have UASB process for treatment of spentwash. This shows that treatment of spentwash through UASB process is not a common practice in Karnataka.	that treatment of spent wash is not a common practice. Clarification request is closed.
CL 6: The project applies for a fixed crediting period with the starting date to be January 1, 2006. This needs to be revised to a date post registration of the project activity.	C.1.2	The starting date of the crediting period will be the date of registration of the project activity.	Starting date of the crediting period has now revised and will be from the date of registration of the project activity. Clarification request is closed.
CL 7: The lowest figure between ER_CH4 ex-ante and ER_CH4 ex-post is to be adopted for emissions reduction determination. This is not apparent in the PDD	E.4.1	The lowest figure between ER_CH4exante and ER_CH4expost is to be adopted for emissions reduction determination. Same has been mentioned in section E.5 in revised PDD version 02.	Revised PDD provided has been verified. Clarification request is closed.

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
CL 8: Evidences of valid Air and Water Consents, issued by the KSPCB shall be provided	F.1.6	Copies of valid air and water consents issued by KSPCB are attached.	Valid consents have been verified and accepted. Clarification request is closed.
CL 9: The PDD does not address: - What were the communications processes adopted for intimation/consultation of the stakeholders - When/where was the meeting held? - Summary of the comments received and action taken	G.1.2	Invitations were sent to the local stakeholders to attend a meeting at SCSL premises. Meeting was held on 17 October, 2005 at Administrative office premises of SCSL. The Minutes of the Meeting held on 17 October 2005 are attached as Appendix 5 in the revised PDD_Version 02.	Minutes of the meeting held on 17 October 2005 has been verified and accepted. Clarification request is closed.

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APPENDIX B

CERTIFICATES OF COMPETENCE



CERTIFICATE OF COMPETENCE

Ramesh Ramachandran

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJi-i1)

GHG Auditor:	Yes		
CDM Validator:	Yes	JI Validator:	--
CDM Verifier:	Yes	JI Verifier:	--
Industry Sector Expert for Sectoral Scope(s):	Sectoral scope 4,5 and 13		
Technical Reviewer for (group of) methodologies:			
ACM0001, AM0002, AM0003, AM0010, AM0011, AM0012, AMS-III.G	--	AM0021	--
ACM002, AMS-I.A-D, AM0019, AM0026, AM0029	Yes	AM0023	--
ACM003, ACM0005, AM0033, AM0040	--	AM0024	--
ACM0004	--	AM0027	--
ACM0006, AM0007, AM0015, AM0036, AM0042	--	AM0028, AM0034	--
ACM0007	--	AM0030	--
ACM0008	--	AM0031	--
ACM0009, AM0008, AMS-III.B	--	AM0032	--
AM0006, AM0016, AMS-III.D	--	AM0035	--
AM0009, AM0037	--	AM0038	--
AM0013, AM0022, AM0025, AM00379, AMS-III.H, AMS-III.I	--	AM0041	--
AM0014	--	AM0034	--
AM0017	--	AMS-II.A-F	--
AM0018	--	AMS-III.A	--
AM0020	--	AMS-III.E, AMS-III.F	--

Høvik, 6 November 2006

Einar Telnes
Director, International Climate Change Services

Michael Lehmann
Technical Director



CERTIFICATE OF COMPETENCE

Kumaraswamy Chandrashekara

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJi-i1)

GHG Auditor:	Yes		
CDM Validator:	Yes	JI Validator:	--
CDM Verifier:	Yes	JI Verifier:	--
Industry Sector Expert for Sectoral Scope(s):	Sectoral scope 4 & 5		
Technical Reviewer for (group of) methodologies:			
ACM0001, AM0002, AM0003, AM0010, AM0011, AM0012, AMS-III.G	Yes	AM0021	Yes
ACM002, AMS-IA-D, AM0019, AM0026, AM0029	Yes	AM0023	Yes
ACM003, ACM0005, AM0033, AM0040	Yes	AM0024	Yes
ACM0004	Yes	AM0027	Yes
ACM0006, AM0007, AM0015, AM0036, AM0042	Yes	AM0028, AM0034	Yes
ACM0007	Yes	AM0030	Yes
ACM0008	Yes	AM0031	Yes
ACM0009, AM0008, AMS-III.B	Yes	AM0032	Yes
AM0006, AM0016, AMS-III.D	Yes	AM0035	Yes
AM0009, AM0037	Yes	AM0038	Yes
AM0013, AM0022, AM0025, AM00379, AMS-III.H, AMS-III.I	Yes	AM0041	Yes
AM0014	Yes	AM0034	Yes
AM0017	Yes	AMS-II.A-F	Yes
AM0018	Yes	AMS-III.A	Yes
AM0020	Yes	AMS-III.E, AMS-III.F	Yes

Høvik, 6 November 2006

Einar Telnes
Director, International Climate Change Services

Michael Lehmann
Technical Director



CERTIFICATE OF COMPETENCE

Praveen Nagaraje Urs

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-
CDMJi-i1

<i>GHG Auditor:</i>	Yes		
<i>CDM Validator:</i>	--	<i>JI Validator:</i>	--
<i>CDM Verifier:</i>	--	<i>JI Verifier:</i>	--
<i>Industry Sector Expert for Sectoral Scope(s):</i>	--		

Høvik, 6 November 2006

Einar Telnes
Director, International Climate Change Services

Michael Lehmann
Technical Director