



Voluntary Carbon Standard 2007
Validation Report
19 November 2007

Validation Report:

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Validation Report for "Siam Cement Biomass Project"	Burcu Mutman 
Client:	Project Title:
SCG Cement Co., Ltd.	Siam Cement Biomass Project
Summary:	
Bureau Veritas Certification has made the validation of "Siam Cement Biomass Project". The validation scope is defined as an independent and objective review of the VCS project description, the project's baseline study, monitoring plan and other relevant documents, and consisted of the following three phases: i) desk review of the project design and the baseline and monitoring plan; ii) follow-up interviews and site visit; iii) resolution of outstanding issues and the issuance of the final validation report and opinion. The overall validation, from Contract Review to Validation Report & Opinion, was conducted using Bureau Veritas Certification internal procedures. The first output of the validation process is a list of Clarification and Corrective Actions Requests (CL and CAR), presented in Annex A (Table 4 of the validation protocol). Taking into account this output, the project proponent revised its VCS project description. In summary, it is Bureau Veritas Certification's opinion that the project correctly applies the baseline and monitoring methodology ACM0003 / version 07.2 and meets the relevant VCS requirements, and local legislation.	
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Table of Contents:

1 Introduction	3
1.1 Objective	3
1.2 Scope and Criteria	3
1.3 VCS project description	3
1.4 Level of assurance	4
2 Methodology	4
2.1 Review of Document	4
2.2 Follow-up Interviews	4
2.3 Resolution of any material discrepancy	5
3 Validation Findings	5
3.1 Project Design	5
3.2 Baseline	6
3.3 Monitoring Plan	8
3.4 Calculation of GHG Emissions	9
3.5 Environmental Impact	9
3.6 Comments by stakeholders	10
4 Validation conclusion	11
5. References	11
Annex A – Validation Protocol	13
Table 1 – Project description	13
Table 2 – Baseline and Monitoring Methodologies	28
Table 3 – Legal Requirements	43
Table 4 – Resolution of Corrective Action and Clarification Requests	44
Annex B - Curricula Vitae of the Validation Team Members	55
Abbreviation List	56

1 Introduction

This report summarizes the findings of the validation of the project, performed on the basis of VCS 2007.1 criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

1.1 Objective

The validation serves as project design verification and is a requirement of all projects. The validation is an independent third party assessment of the project design. In particular, the project's baseline, the monitoring plan (MP), and the project's compliance with relevant VCS criteria which 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 a requirement for all VCS projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of Voluntary Carbon Units (VCUs).

1.2 Scope and Criteria

The validation scope is defined as an independent and objective review of the project description, the project's baseline study and monitoring plan and other relevant documents. The information in these documents is reviewed against UNFCCC Methodological requirements, VCS rules and associated interpretations. The validation is not meant to provide any consulting towards the Client. However, stated requests for clarifications and/or corrective actions may provide input for improvement of the project design.

1.3 VCS project description

The project is a combination of five GHG reduction projects located in five different cement manufacturing units of SCG Cement Co.,Ltd, in Thailand. All project activities in this group involve partial replacement of fossil fuels by alternative fuels or less carbon intensive fuels, including biomass, in kiln processing of cement manufacture. In order to implement the project activities a complete system for receiving, storing, and feeding alternative fuels and less carbon intensive fuels needs to be introduced.

The proposed grouped project has been implemented at The Siam Cement (Ta Luang) Co., Ltd. (Ta Luang Cement Plant and Kao wong Cement Plant), The Siam Cement (Kaeng Khoi) Co., Ltd., The Siam Cement (Thong Song) Co., Ltd., and The Siam Cement (Lampang) Co., Ltd. SCG Cement Co., Ltd. has 100% shareholding in these five companies. According to Voluntary Carbon Standard Program Guidelines, clause 5.2 (Group Projects), the central GHG information system and controls associated with the project and its monitoring will response by SCG Cement Co. Ltd.

As per VCS program guidelines (18 November 2008), the proposed grouped project is expected to reduce anthropogenic emissions by sources within 5,000 – 1,000,000 tonnes of carbon dioxide equivalent annually. It can be categorised in sectoral scope No.4 "Manufacturing Industries" under UNFCCC guideline.

To implement of the project activities is able to reduce the GHG emission from fossil combustion in kiln processing with amount of VCUs expected over 10 year crediting period: 6,102,304 tCO₂e.

1.4 Level of assurance

The Level of assurance of the Validation Report is defined as high.

2 Methodology

The overall validation, from Contract Review to Validation Report & Opinion, was conducted using Bureau Veritas Certification internal procedures.

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

- It organizes, details and clarifies the requirements of a VCS 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.

VCS methodologies describe either:

- The methodology to determine a projects baseline scenario emissions levels and the process to monitor emissions reductions;
- A performance standard methodology to demonstrate that a project is additional (beyond normal business activities).

2.1 Review of Document

The VCS project description (VCS PD) was submitted to validation team of Bureau Veritas Certification, Thailand, at the beginning of contract commissioning period. The VCS project description was verified against VCS Project description Template, VCS version 2007.1 (18 November 2008), Approved methodology, and Country law and regulation. Because there are no VCS specific methodologies approved by the VCS Board, all documents were reviewed under the requirements of the CDM Methodologies.

Clarifications and Corrective actions on the VCS project description were raised for SCG Cement Co., Ltd. who would, then, resubmitted the revised VCS project description to the validation team in order to address all comments accordingly. The validation report is based on the current version of VCS project description, title "Siam Cement Biomass Project" (version 02) dated 24 September 2009.

2.2 Follow-up Interviews

Validation on site has been performed in June 2009 (11, 12, and 15 June 2009) at each location of this grouped project activity. Objective of the site visit was to validate background information, baseline, project activities, leakage, as well as environmental impact assessment against what were claimed in the VCS project description and the approved methodology.

During the validation, main operators who were responsible for purchasing, receiving, handling, processing and storage of biomass and less carbon intensive fuels were interviewed. Their actual operations were observed along with examining relevant records. In addition, the kiln processing

operators, maintenance officers, and biomass section manager and technicians, were interviewed and observed their actual operation during the on site validation. Any additional supporting documents and records were reviewed and compared with relevant requirements.

Public consultation of the grouped project was performed during the study of the EIA report by means of explanation of the project activity to the participants. EIA reports from each site were validated and found comments about dust and particles were made to the proposed project activities. During the validation, validation team examined evidences from the existing complaints responding system at each project sites as a part of implementation the Quality, Occupational Health and Safety, and Environmental management system in the grouped projects. The records of complaints received were checked by validation team along with results from EIA reports. There have not been local stakeholders complaints related to biomass handling and processing at any sites since 2002. The PP has a local stakeholders' satisfaction survey to ensure that they are satisfied with the environmental performance of the cement plants. This survey was done randomly, and recent survey was implemented at Siam Cement Kaeng khoi site using face – to –face interview that covered 18 villages with sampling size 650 people. This report was released on 9 February 2006 and satisfaction level was 90%. Comment on cement dust was raised and reponse from the Siam Cement Kaeng khoi Co., Ltd, was to continue increasing density of trees in the buffer zone and closely communicate with local stakeholders. However, clarification request was raised by validation team to PP in order to declare method and result from public hearing in the VCS project description. Response to this clarification was satisfactory, information was added in the VCS project description version 2, and clarification was closed.

In summary, during validation period, evidences were collected and carefully evaluated. Clarifications (CLs) and Corrective Actions Request (CARs) were raised and documented in the Validation protocol. After the discussions and reviews of additional evidences, the Validation Team closed all CLs and CARs on 27/09/2009 and documented them in the Validation protocol.

2.3 Resolution of any material discrepancy

During the Validation no material discrepancies were identified.

3 Validation Findings

3.1 Project Design

Bureau Veritas Certification recognizes that the Siam Cement Biomass project is able to reduce the GHG emission from fossil combustion in kiln processing and to help reducing the usage of non-renewable energy in its regional locations. The grouped project activities not only conform to the host-country specific requirements and local environmental requirements, but also fulfill its goal of promoting sustainable development in the host country, Thailand.

The proposed project activities involve the installation of storage and handling system for alternative fuels and less carbon intensive fuels, including biomass and other alternative fuels. In order to implement the project activities, the installation of a

complete system for receiving, storing, processing, preparing and feeding of biomass were implemented. However, there were slightly different in each site on biomass processing and preparation depending on type of the main biomass residue used in the site.

The definition of Project Start Date in VCS 2007.1 is “Date on which the project began reducing or removing GHG emissions”. Project starting dates of each site in the grouped project activities are different as stated below;

The Siam Cement (Kaeng Khoi)	04/10/2002
The Siam Cement (Ta Luang)	15/10/2002
The Siam Cement (Khao Wong)	30/09/2004
The Siam Cement (Lampang)	30/04/2004
The Siam Cement (Thung Song)	19/01/2003

Evidences of production data record when each site started feeding biomass into cement production kilns, were checked and CAR 1 was raised as the previous version of VCS project description declared the date of project reached the financial closure. The project proponent responded by revising the project start date in VCS project description version 2. It was confirmed by DOE that the date the project activity began reducing or removing GHG emissions were referred to the date of start feeding biomass into the production kilns at each site. Therefore, response to CAR1 is satisfactory and CAR 1 is closed.

Crediting period of all sites starts at 1 April 2006.

The project comes under sectoral scope 04 - “Manufacturing Industries”. Siam cement Biomass Project will be registered as a Voluntary Carbon standard (VCS) project and facilitate the project implementation with carbon revenue coming from the carbon credits sale. Due to its significant contribution in diminishing carbon emissions and protecting the climate this project is anticipated to fulfill VCS and qualify for carbon finance. The project has not been rejected by another GHG program before. Thailand is the host country and is ratified the United Nations framework Convention on Climate Change on 28 December 1994 and Kyoto Protocol on 28 August 2002. The project has applied Environmental Impact Assessment for all activities within the grouped projects and been approved by the government before starting the construction.

3.2 Baseline

Baseline of the proposed grouped project activities was established and it followed the approved consolidated baseline and monitoring methodology ACM0003 version 07.2 “Emissions reduction through partial substitution of fossil fuels with alternative fuels or less carbon intensive fuels in cement manufacture”.

All applicability conditions of ACM0003 version 07.2 have been examined together with relevant documents during the on site validation to ensure of its deemed applicable to this project. The justification of proposed project activity that meets relevant applicability conditions are, as follows;

- A significant investment is required for new machinery installation, including storage, handling and transporting system to enable the use of alternative fuels and/or the less carbon intensive fossil fuels.
- There were no alternative fuels and biomass have been consumed during the last three years prior before the start of the project activity
- The CO₂ emission reductions are only related to the CO₂ generated by fuel burning requirement and not by decarbonisation of raw material.

- The installed capacity exists by the time of validation of the project activity and that it has not changed in each site during the time of validation
- In case of the project activities using biomass residues,
 - the biomass residues used in the project plants are not chemically processed prior to combustion in the project plant.
 - All biomass residues used in the project plants is stored under aerobic condition and it is stored not more than one year.
- There were no renewable biomass from a dedicated plantation is used in all project activities.

In the absence of the proposed project activity, plausible and credible project activities to the proposed project activity according to the fuel mix for cement manufacturing are as follows:

- Continuation of current practice, i.e., a scenario in which the company continues cement production using the existing technology, materials and fuel mix.
- The continuation of using only fossil fuels and no alternative fuels; however, with a different fuel mix portfolio, taking into account relative prices of fuels available. The scenario(s) may be based on one fuel or a different mixes of fuels.

As the grouped project activities use alternative fuels, the determination of plausible alternatives where wastes originating from fossil sources are used as the alternative fuel are,

- Incineration of the waste in a waste incinerator without utilizing the energy from the incineration
- Disposal of the waste at a managed or unmanaged landfill.

And the plausible alternative when biomass residues are used as the alternative fuel is,

- The biomass residues are burnt in an uncontrolled manner without utilizing them for energy purposes

The additionality of the grouped project activities was demonstrated using the “combined tool to identify the baseline scenario and demonstrate additionality” version 02.2 approved by UNFCCC. This was done using a step by step approach for all above step covering: Regulatory Surplus, Implementation Barriers and Common Practice assessment of additionality. All these steps as detailed in the VCS project description were verified by the validation team and evidences were checked to confirm the accuracy of the data provided.

In this grouped project, the technological barrier, lack of prevailing practice and investment barrier are considered as main barriers for the implementation of all project activities.

Technological barriers as claimed in the VCS project description were described and supported by credible reference from external researches and from the Siam Cement Group annual reports, that clinker productions were effected in efficiency and quality as a resulted of using rice husk.

The homogeneous energy flow, that is crucial for persistently high clinker quality, was affected by using biomass and cause unsmoothed flow in the production. Evidences of fluctuate trend in energy flow and production problems, including clogging of biomass in feeding system, were shown during site visit. Emergency procedure and operational control due to clogging and burning of biomass in the system were established. The Project proponent has provided training and drilling for operators

accordingly and relevant records were reviewed during site visit. In addition, it was found in every site that the new feeding point and design had been researched and installed to prevent such problem. The knowhow and problem solving technique was introduced and transferred from one site to another, and that associated with additional investment cost.

At Thung Song site, different types of alternative fuels (biomass) and the changes in the alternative fuels mix composition used in the clinker production were found. The site has faced restriction in access to availability of rice husk, base on specific geological location of the Southern Thailand. Therefore, this situation reflected in often disturbance in process. To overcome the problem, the project proponent has adopted strictly quality control criteria on the moisture level of incoming materials, with installation of dryer system before feeding biomass into kilns.

For investment barrier, the PP declared that vast amounts of money for developing the technologies, including machines, process control system and staff training. In addition, Cement price, at the time when the investment decision was made, had dropped and was fluctuating and caused financial risk to the group. To assess of financial barrier, Clarification (CL) was raised by validation team for further supporting evidence. Project proposal and report on investment cost of each site were submitted for examine. Response to this CL was accepted..

To assess the first of its kind, the validation team has searched the list of cement manufacturing in Thailand that used biomass as a partial fuel in kiln at the time of project starting date. There were a few numbers of small scaled power plants around Thailand that used biomass in power cogeneration. There were no other project activities in cement manufacturing in Thailand concerned to substitute the fossil fuels with alternative fuels and biomass residue in cement processing on that period. Clarification (CL) was raised by validation team for further supporting evidence of such claim. In response, relevant legislation of biomass and other waste disposal in cement kiln is used as a proof to first of its kind for this grouped project. The dates of approval stated in the registration of “factory permit (type 101)” from local authority to Kaeng Khoi factory site which was the first authorized factory in Thailand to disposal waste (Biomass and other wastes) by their designed technology in 2001. Response was satisfactory and CL was closed. Therefore, DOE validated that the group of cement plant in this grouped project is the first of its kind in Thailand.

All the plausible and credible alternatives to the proposed project activity demonstrated above are in line with all applicable legal and regulatory requirements. The EIA reports have been granted for all sites.

The validation team made a decision to valid the Siam Cement Biomass project as being additionality, based on all evidences being submitted and reviewed according to the above mentioned tool.

3.3 Monitoring Plan

The grouped project uses monitoring methodology according to the approved consolidated baseline and monitoring methodology ACM0003 version 07.2 “Emissions reduction through partial substitution of fossil fuels with alternative fuels or less carbon intensive fuels in cement manufacture”.

As mentioned in the methodology the information to be monitored during the project

activity is the Quantity of alternative fuel or less carbon intensive fossil fuel type k , Net Calorific value of the fuel (GJ/mass or volume units), Fuel Emission Factor (tCO₂/GJ), Project emissions from additional fossil fuel combustion (tCO₂), Production of clinker (tonnes/y), Average round trip distance (from and to) between the alternative fuel supply sites and the site of the project plant (KM), Quantity of alternative fuel type k that has been transported to the project site (tonnes), Average truck load of the trucks used (tonnes), and other parameters. These parameters will be calculated using the primary data. Primary data, such as Quantity of alternative fuels and Production clinker, and other related data, will be recorded in paper and electronic form on a daily basis. Data from each site will be centralised at SCG's Engineering Department and emission calculation and emission monitoring report will be issued by the consultant following the methodology (ACM0003 /version 07.2).

The primary parameters required to be monitored during the crediting period are set in the monitoring plan. Detailed information related to the collection and archiving of all relevant data in the monitoring plan, reflects good monitoring practice appropriate to this type of project activity, and are correctly listed in the VCS project description tables according to ACM0003 version 07.2.

Proper metering equipments have been installed comprising a set of digital weight scales at the incoming point and inside the feeders. All measuring scales were included in an annual preventive maintenance program and calibration plan. Data of previous maintenance and calibration are available.

The site operator and engineer are responsible for collection of the monitoring data and the data will be approved by section manager and plant manager respectively. All data will be maintained for minimum 3 year beyond the duration of the project according to ISO9001. The responsibility of on-site staffs to collect the monitoring data is written in Job Description and Work Instruction under ISO9001 guidance.

3.4 Calculation of GHG Emissions

Baseline emission, Project emission, and fuel penalty are calculated according to the formula given in ACM0003 version 07.2. Leakage is ruled out by complete and transparent illustration of the availability of biomass (rice husk) that was larger than 25% of the demand of rice husk utilised for energy in this region at the starting period.

During the on-site validation, it was found that project activities at each site were slightly different and thus project emissions calculation need to be revised. In addition, some primary data on site were not correctly quoted in the calculation of baseline emission. CAR 3, 4 and 5 were raised. The project proponent has revised and recalculated all the baseline emissions, project emissions, and emission reductions accordingly. Therefore, responses to CAR 3, 4 and 5 were satisfactorily closed.

As in VCS project description Version 02, the transparency of formulas and factors are referred in Section 4 of the VCS project description as well as in the Calculation sheet that are correctly quoted as per primary data. Conservative options and data were selected during the implementation of the methodology.

Expected VCUs per annum by each project site as follows:

The Siam Cement (Ta Lung) Co., Ltd. (Ta Lung): 32,948 tCO₂e

The Siam Cement (Ta Lung) Co., Ltd. (Khao Wong): 175,019 tCO₂e

The Siam Cement (Kaeng Khoi) Co., Ltd.: 239,771 tCO₂e

The Siam Cement (Thong Song) Co., Ltd.: 121,635 tCO₂e

The Siam Cement (Lampang) Co., Ltd.: 40,857 tCO₂e

VCUs expected over 10 year crediting period: 6,102,304 tCO₂e

3.5 Environmental Impact

Environmental Impact Assessment (EIA) Report is required by the government for this type of project; all project activities in the grouped project had a completed report before starting the construction. The project proponents have undertaken an analysis of the environmental impact of the project activity to ensure minimum impacts on the environment and to determine any mitigation measures if such impacts are significant. The EIA Report from each project plant has been approved by the Office of Natural Resources and Environmental Policy and Planning (ONEP). According to ONEP approval, the project complies with environmental registration in Thailand. Also environmental impacts in the projects have been identified in EIA report.

Details of the analysis of the environmental impact in each project site were validated by the DOE team during on-site Validation. The main indentified environmental impacts associated with the project activities are air pollution, water pollution and noise. The details are validated both in the EIA report and on site visit. It was observed from each site that dust and small particles from rice husk have been considered during the operation. The dust collector and belt cover was installed to reduce the dust and small particle around the working area.

SCG Cement Co., Ltd. has implemented ISO 14001 at each site in the grouped project, responsibilities and procedures concerned with monitoring and evaluation of compliance to laws and related environmental requirements were in placed and implemented. Monitoring data on dust, noise, and air pollution from the activities were recorded regularly and declared to DOE during site visit to ensure its conformity.

3.6 Comments by stakeholders

Stakeholder consultation was carried out by the project owner at all sites which was reported in the EIA report. The consultation included an explanation of the project activity to the participants. Stakeholder consultation was held at each site on the date shown below.

The Siam Cement (Kaeng Khoi) 22/11/1999

The Siam Cement (Ta Luang) 01/11/1999

The Siam Cement (Khaowong) 23/12/1999

The Siam Cement (Lampang) 27/09/2001

The Siam Cement (Thong Song) 22/02/2002

Participants were able to examine the location where the proposed project would take place, and informed the purpose of consultation, description of the project, and its environmental impacts. The overall response to the project was encouraging and positive to local environment and social-economic conditions i.e. the stakeholders appreciate the wastewater and biomass treatment in a more efficient way in which irritable odor can be avoided while creating new jobs. In all, no adverse reactions, comments, or clarifications were received during the stakeholder consultation process. The project participants did not recognize any need to make changes to the project design or monitoring plans.

Statements above were confirmed by the annual environmental performance report of each site. DOE has examined related evidences from complaints response system during site visit of each project site and therefore validated the statement above.

4 Validation conclusion

Bureau Veritas Certification has performed a validation of “Siam Cement Biomass Project” by SCG Cement Co., Ltd., Thailand.

The validation was performed on the basis of VCS 2007.1 criteria and host country criteria and also on the criteria given to provide for consistent project operations, monitoring and reporting.

The validation consisted of the following three phases:

- i) A desk review of the project design and the baseline and monitoring plan; (May 2009)
- ii) Follow-up interviews and on site visit; (June - September 2009)
- iii) The resolution of outstanding issues and the issuance of the final validation report and opinion (September 2009).

Project proponents used the combined tool to identify the baseline scenario and demonstrate additionality” version 02.2 approved by UNFCCC. The VCS project description provides technical barriers and prevailing barriers to determine that the project activities are met with additionality conditions, and therefore not the baseline scenario. DOE has carefully examined the various barriers demonstrated that the proposed project activity 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.

Given that the project is implemented and maintained as designed, the project is likely to achieve the estimated amount of emission reductions. The review of the project description and the subsequent follow-up interviews, have provided Bureau Veritas Certification with sufficient evidence to determine the fulfillment of stated criteria. In our opinions, the project correctly applies and meets the relevant VCS requirements and the relevant host country criteria. The validation is based on the information made available to us and the engagement conditions detailed in this report.

5 REFERENCES

Documents provided by SCG Cement Co., Ltd.

1. VCS project description for “Siam Cement Biomass Project”, SCG Cement Co., Ltd., Thailand.
 - Version 01, dated 9 April 2009.
 - Version 02, dated 24 September 2009.
2. Voluntary Emission Reduction Calculation Sheet
 - (Version 1) dated 9 April 2009.
 - (Version 2) dated 24 September 2009.
3. The approved consolidated baseline and monitoring methodology ACM0003 version 07.2 “Emissions reduction through partial substitution of fossil fuels with alternative fuels or less carbon intensive fuels in cement manufacture”.

4. The combined tool to identify the baseline scenario and demonstrate additionalty” version 02.2
5. VCS project description Template – 19 November 2007
6. VCS 2007 validation report Template - 19 November 2007
7. Voluntary Carbon Standard 2007.1

Persons interviewed:

1. Dr. Kriengkrai Suksankraisorn, General Manager, Cementhai Energy Conservation Co., Ltd. (Representative of The SCG Cement Co.,Ltd.)
 2. Mr. Pichai Trisinwattanukul, Senior Engineer, The Siam Cement (Thung Song) Co.,Ltd.
 3. Mr. Charoenmun Chaliewkreangkrai, Senior Engineer, The Siam Cement (Ta Luang) Co.,Ltd.
 4. Mr. Sumret Ruangrit, Production Specialist-Mill, The Siam Cement (Kaeng Khoi) Co.,Ltd.
 5. Mr. Pookpan Ratanapairojkul, Production Engineer, The Siam Cement (Kaeng Khoi) Co.,Ltd.
 6. Mr . Adul Thongprasom, Production Engineer, The Siam Cement (Lampang) Co.,Ltd.
 7. Mr. Sittisak Sugsaisakorn, CDM Project Manager, South Pole Carbon Asset Management Ltd.
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Annex A
Validation Protocol
Siam Cement Biomass Project

TABLE 1: Project description

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
A. Project Design Validation of project design focuses on the choice of technology and the design documentation of the project.					
A.1.1.Does the project description document provide information kind of technology used of the project activity?	VCS	3.1	The VCS PROJECT DESCRIPTION is identified as “Siam Cement Biomass Project” version 1 (09/04/2009). Project description is stated in section 1.4 of the VCS PD that the proposed project activities involve the installation of storage and handling system for alternative fuels and less carbon intensive fuels, including biomass and other alternative fuels, to partially substitute of fossil fuels. According to on-site validation conducted on 11,12 and 15th June,2009, each site has slight differences in equipments installed, type of biomass and additional process to preparation of biomass before feeding into cement kilns. Therefore, clear flowchart and description of technology and activities related to each site installation, storage and handling are needed to be clarified in the VCS PD.	~~CL1~~	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
A.1.2. Is the starting date of the project and the project duration clearly defined?	VCS	3.1	The starting date of the grouped project is defined in table 5 of section 1.6 of the VCS PD as following; The Siam Cement (Kaeng Khoi) start date 21/10/2002 The Siam Cement (Ta Luang) start date 18/12/2002 The Siam Cement (Khao Wong) start date 30/04/2003 The Siam Cement (Lampang) start date 10/12/2005 The Siam Cement (Thung Song) start date 18/07/2006 The project duration is defined in the same section at 20 years. The VCS 2007.1 definition for project start date has been changed from the “date on which the project reached financial closure” to “the date the project activity began reducing or removing GHG emissions”. Evidences collected from sampling sites; Kaeng Khoi, Khao Wong, Thung song, does not conform to the start date referred in the VCS PD as above.	CAR-1	OK
A.1.3. Does the proof of ownership clearly defined ?	VCS	3.1	Evidence of the proof of ownership has not been received during the validation.	GL-2	OK
A.1.4. Will the project result in technology transfer to the host country?	VCS	3.1	Yes. Equipments and technologies had been installed on each site along with training programme. During validation, there are evidences of technology transferred within the grouped project. Since year 2002 at Siam cement Kaeng Khoi to year 2006 at Siam Cement Thung Song, there have been reports and events to support that technology and knowledge sharing as well as developments to utilize the use of biomass at each site.	OK	OK

A.1.5. Does the VCS PD provide information about double counting and whether the project participated in the another emission trading program ?	VCS	3.5	The grouped project has not applied for any other form of environmental credit. (Refer to section 1.13) However, letter of confirmation from project proponents has not been received during on-site validation.	~~CL3~~	OK
A.1.6. Was the project activity rejected under any other GHG programme ?	VCS	3.5	No sub-projects have been applying under other GHG reduction programmes. (Refer to section 1.14)	OK	OK
B. Project Baseline The validation of the project baseline establishes whether the selected baseline methodology is appropriate and whether the selected baseline represents a likely baseline scenario.					
B.1. Baseline Methodology It is assessed whether the project applies an appropriate baseline methodology.	ACM 0003 v.07.2				
B.1.1. Is the selected baseline methodology in line with the baseline methodologies provided for the relevant project category?			Yes. The grouped project activity applies approved consolidated baseline and monitoring methodology ACM0003 version 07.2 “Emissions reduction through partial substitution of fossil fuels with alternative fuels or less carbon intensive fuels in cement manufacture” .	OK	OK
B.1.2. Is the applied methodology version the most recent one or is still applicable?			Yes. Current version of ACM0003 is 07.2.	OK	OK
B.1.3. Is the baseline methodology applicable to the project being considered?			Yes. Reasonable justification is stated in section 2.2 of VCS PD.	OK	OK
B.1.4. Is the justification to the choice of project category <u>transparent</u> ?			No. Justification to choice of project category is not clearly support by objective evidence, as the following;	-	
Refer to ‘Applicability’ in the approved consolidated					

baseline and monitoring methodology ACM0003 version 07.2 The following conditions shall apply: • A significant investment is required to enable the use of the alternative fuel(s) and/or the less carbon intensive fossil fuel(s); • During the last three years prior to the start of the project activity, no alternative fuels have been used in the project plant; • The CO₂ emissions reduction relates to CO₂ emissions generated from fuel combustion only and is unrelated to the CO₂ emissions from decarbonisation of raw materials (i.e. CaCO₃ and MgCO₃ bearing minerals); • The methodology is applicable only for installed capacity (expressed in tons clinker/year) that exists by		Refer to section 2.2 of VCS PD, reasons for validating each applicability condition are; Justification1 : A significant investment is required for new machinery installation, including storage, handling and transporting system to enable the use of alternative fuels and/or the less carbon intensive fossil fuels. (Justification1) Evidences of investment on machine installation and relevant activities are required to support this justification. Justification2: According to the fuel consumption work journal during the last three year prior before the start of the project activities, there are no alternative fuels and biomass have been consumed. However a small amount of alternative fuels was used in testing phase of the projects. (Justification2)Work journals of the last 3 years prior to start dates of the grouped project are required to proof transparency of fuel consumption data and correct calculation of baseline emission, as claimed in the VCS PD. Justification3: The CO₂ emission reductions are only related to the CO₂ generated by fuel burning requirement and not by decarbonisation of raw material. Justification4:	CL4 CL5 OK OK	OK OK OK
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the time of validation of the project activity. In case of project activities using biomass residues or renewable biomass, the following applicability conditions apply: • The biomass is not chemically processed (e.g. esterification to produce biodiesel, production of alcohols from biomass, etc) prior to combustion in the project plant but it may be processed mechanically or be dried at the project site. Moreover, any preparation of the biomass, occurring before use in the project activity, does not cause other significant GHG emissions (such as, for example, methane emissions from anaerobic treatment of waste water or from char coal production); • The biomass used by the project facility is stored under aerobic conditions.		The installed capacity has not changed in each site during the time of validation. (refer to Table 2 of the VCS PD) Justification5: The biomass residues used in the project plants are not chemically processed prior to combustion in the project plant. Justitification6: No biomass residues used in the project plant is stored under aerobic condition and it is stored not more than one year. (Justification6) This statement is wrongly quoted in the VCS PD as it is observed at Siam Cement Thung Song that charcoal residues are used and that it is stored under aerobic condition, although period is not more than 1 year. Additional statement in section 2.2 of the VCS PD is that there are no renewable biomass from a dedicated plantation used in all project activities. This statement is proved to be transparent.	OK OK CAR2 OK OK	OK OK OK OK OK
B.1.5. Is it demonstrated 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, technology barriers, barriers due to prevailing practice or other barriers?		The assessment and demonstration of additionality is described in section 2.5 of VCS PD. The grouped project has shown financial barriers, technology barriers and barriers from prevailing practice. However, investment analysis is not taken as		

		EM39 “Tool for the demonstration and assessment of additionality” (Version 05.2) is referred and that requires either an investment analysis or barrier analysis to be taken. Evidences for financial barriers and technology barriers are required from each site to prove that the grouped project is additional. (See Table 2, question 1.4.1, 1.4.3, 1.4.4)	CL6	OK
B.1.6. Is the application of the baseline methodology and the discussion and determination of the chosen baseline transparent and conservative?		Yes. Justification on alternative scenarios is transparently discussed in section 2.4 of VCS PD.	OK	OK
B.1.7. Is the baseline selection compatible with the available data?		Yes.	OK	OK
B.1.8. Does the selected baseline represent the most likely scenario describing what would have occurred in absence of the project activity?		Yes. Plausible scenarios are proved applicably to the applied methodology, and are additionalities.	OK	OK
B.1.9. Are the variables, parameters and data sources made available in the VCS PD in tabular form?		Yes, under section 3.3 of the VCS PD has provided information variables, parameters and data sources. These parameters are made available in the tabular form.	OK	OK
C. Project Monitoring The monitoring plan review aims to establish whether all relevant project aspects deemed necessary to monitor and report reliable emission reductions are properly addressed.				
C.1. Monitoring Methodology It is assessed whether the project applies an appropriate monitoring methodology.				
C.1.1. Is the selected monitoring methodology in		Yes. The grouped project activity applies approved	OK	OK

line with the monitoring methodologies provided for the relevant project category?			consolidated baseline and monitoring methodology ACM0003 version 07.2 "Emissions reduction through partial substitution of fossil fuels with alternative fuels or less carbon intensive fuels in cement manufacture".		
C.1.2. Is the monitoring methodology applicable to the project being considered?			The reasons for choosing this monitoring methodology are appropriately justified in section 2.4 of VCS PD.	OK	OK
C.1.3. Is the application of the monitoring methodology transparent?			Yes.	OK	OK
C.1.4. Will the monitoring methodology give opportunity for real measurements of achieved emission reductions?			The applied monitoring methodology gives opportunity for real measurements of achieved emission reductions and project emission calculated as per methodology.	OK	OK
C.2. Monitoring of Project Emissions It is established whether the monitoring plan provides for reliable and complete project emission data over time.					
C.2.1. Are the choices of project emission indicators reasonable?			The project activity emissions are including project emission from the use of alternative fuels which original from fossil fuel, additional electricity, and combustion of fossil fuels for transportation of alternative fuels and biomass residue. No renewable biomass from a new dedicated plantation is used in the project plants. Therefore, only CO2 emissions are used as emission indicator in project activity.	OK	OK
C.2.2. Will it be possible to monitor / measure the specified project emission indicators?			Yes. Project emissions calculation is calculated from the energy consumption of the project that is based on the quantity of all fuels used in the project, additional electricity, and the quantity of clinker produced in year. However, evidenced of log sheets of biomass consumption, clinkers production, and evidences of	~~CL7~~	OK

			additional electricity, and fuels used for transportation of biomass (to the project sites and within the sites) during 2006 – 2007 are required to validate the completeness and correctness of emission indicators and its measurement data. (see Table 2, Question 1.5.3)		
C.2.3. Do the measuring technique and frequency comply with good monitoring practices?			Yes. The measuring technique and frequency comply with good monitoring practices as it is included in the existing ISO9001 operating procedures.	OK	OK
C.2.4. Are the provisions made for archiving project emission data sufficient to enable later verification?			No, the provisions made for archiving project emission data are not sufficient. The records of alternative fuels consumption that used in calculation emission reduction during 2006 – 2007, can not be archived and validated. (See table 2, Question 1.5.3)	CAR3	OK
C.3. Monitoring of Leakage It is assessed whether the monitoring plan provides for reliable and complete leakage data over time.					
C.3.1. If applicable, are the choices of leakage indicators reasonable?			The methodology ACM0003 version 7.2 which is used for this project identifies "For this type of project activity, two leakage sources have to be considered: • In case of project activities using biomass residues, the project activity may result in an increase in emissions from fossil fuel combustion or other sources due to diversion of biomass residues from other uses to the project plant as a result of the project activity; • In case of project activities using (a) less carbon		

		intensive fossil fuel(s), leakage may result from fuel extraction, processing, liquefaction, transportation, re-gasification and distribution of fossil fuels outside of the project boundary. This includes mainly fugitive CH ₄ emissions and CO ₂ emissions from associated fuel combustion and flaring."		
		Clear clarification for not including these leakages is required to explain in the VCS PD. (See C.3.1 above)	CL8	OK
C.3.2. If applicable, will it be possible to monitor / measure the specified leakage indicators?		(See C.3.1 above)	(Refer to CL8)	OK
C.3.3. If applicable, do the measuring technique and frequency comply with good monitoring practices?		(See C.3.1 above)	(Refer to CL8)	OK
C.3.4. If applicable, are the provisions made for archiving leakage data sufficient to enable later verification?		(See C.3.1 above)	(Refer to CL8)	OK
C.4. Monitoring of Baseline Emissions				
It is established whether the monitoring plan provides for reliable and complete project emission data over time.				
C.4.1. Is the choice of baseline indicators, in particular for baseline emissions, reasonable?		Baseline emission, CO ₂ , is calculated from displacement of fossil fuel by mix fuel, alternative fuel, and biomass residue, whereas CH ₄ is calculated from default CH ₄ factor referenced in the methodology (ACM0003 version 07.2), page 17.	OK	OK
C.4.2. Will it be possible to monitor / measure the specified baseline emission indicators?		Yes	OK	OK
C.4.3. Are the provisions made for archiving baseline emission data sufficient to enable later verification?		Yes	OK	OK
C.5. Project Management Planning				
It is checked that project implementation is properly				

prepared for and that critical arrangements are addressed.					
C.5.1. Is the authority and responsibility of project management clearly described?			Yes. There is 'Biomass Section' in each project site which is responsible for sourcing and preparing biomass to feed the burner. Responsibilities and authorities are described in Job description.	OK	OK
C.5.2. Is the authority and responsibility for monitoring measurement and reporting clearly described?			Production clinkers operators are responsible for recording data related to biomass consumption in the cement clinkers on daily basis.	OK	OK
C.5.3. Are procedures identified for training of monitoring personnel?			There is existing procedure in the ISO9001 documentation identified for training of monitoring personnel on each site; however it does not cover records of on-the-job training that all sites provided for qualifying of all personnel involved in this project.	CL9	OK
C.5.4. Are procedures identified for calibration of monitoring equipment?			Yes. There is existing procedure in the ISO9001 documentation identified for calibration of monitoring equipment.	OK	OK
C.5.5. Are procedures identified for maintenance of monitoring equipment and installations?			Yes. There is existing procedure in the ISO9001 documentation identified for maintenance of monitoring equipment and installations, and preventive maintenance program.	OK	OK
C.5.6. Are procedures identified for monitoring, measurements and reporting?			The existing procedures in the ISO9001 documentation do not provide clear identification for monitoring, measurement, and reporting of relevant data and emission calculation, as well as dealing with possible data adjustments un uncertainty.	CL10	OK
C.5.7. Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)			There is existing procedure in the ISO9001 documentation identified for control of quality records, <u>however</u> it is found during validation that the maximum retention period of quality records are	CL11	OK

		set at 3 years, therefore, some primary records to calculate baseline emission before year 2006 are removed from the system.		
C.5.8. Are procedures identified for dealing with possible monitoring data adjustments and uncertainties?		(See C.5.6 above)	(Refer to GL10)	OK
D. GHG Emission Reduction 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.				
D.1. Project GHG Emissions The validation of predicted project GHG emissions focuses on transparency and completeness of calculations.				
D.1.1. Are all aspects related to direct and indirect project emissions captured in the project design?		Yes, followed ACM0003 version 07.2 methodology.	OK	OK
D.1.2. Have all relevant greenhouse gases and sources been evaluated?		Yes, see above.	OK	OK
D.1.3. Do the methodologies for calculating project emissions comply with existing good practice?		Yes, methodologies for calculating project emissions calculation stated in the VCS PD comply with ACM0003 version 07.2 .	OK	OK
D.1.4. Are the calculations documented in a complete and transparent manner?		No. Calculation sheet provided with the VCS PD refers to some data that are different from the actual primary records, and does not cover all possible sources of project emission, such as transportation within the site boundary from biomass collection site to preparation area and trucks that used in grinding and feeding biomass into shredding machines, self electricity	CAR4	OK

		consumption of machines and equipment in preparation process i.e. wood chipping, shredding, dryer and conveyors, fossil fuel used in warming and start-up of clinker burners, etc. (See Table 2, Question 1.8)		
D.1.5. Have conservative assumptions been used?		(See D.1.4 above)	~~(Refer to CAR4)~~	OK
D.1.6. Are uncertainties in the project emissions estimates properly addressed?		(See D.1.4 above)	~~(Refer to CAR4)~~	OK
D.2. Leakage 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.				
D.2.1. Are leakage calculations required for the selected project category and if yes, are the relevant leakage effects assessed? ACM0003 version 07.2, Two leakage sources are to be considered; • In case of project activities using biomass residues, the project activity may result in an increase in emissions from fossil fuel combustion or other sources due to diversion of biomass residues from other uses to the project plant as a result of the project activity; • In case of project activities using (a) less carbon intensive fossil fuel(s), leakage may result from fuel extraction, processing, liquefaction, transportation, re-gasification and distribution of fossil fuels outside of the project boundary. This includes mainly fugitive CH₄ emissions and CO₂		The VCS PROJECT DESCRIPTION does not provide justification for not including all the sources of leakage as per methodology. (Refer to question C.3)	~~(Refer to CL8)~~	OK

emissions from associated fuel combustion and flaring.					
D.2.2. Are potential leakage effects properly accounted for in the calculations (if applicable)?			(See above)	(Refer to CL8)	OK
D.2.3. Do the methodologies for calculating leakage comply with existing good practice (if applicable)?			(See above)	(Refer to CL8)	OK
D.2.3. Do the methodologies for calculating leakage comply with existing good practice (if applicable)?			(See above)	(Refer to CL8)	OK
D.2.5. Have conservative assumptions been used (if applicable)?			(See above)	(Refer to CL8)	OK
D.2.6. Are uncertainties in the leakage estimates properly addressed (if applicable)?			(See above)	(Refer to CL8)	OK
D.3. Baseline GHG Emissions The validation of predicted baseline GHG emissions focuses on transparency and completeness of calculations.					
D.3.1. Are the baseline emission boundaries clearly defined and do they sufficiently cover sources for baseline emissions?			The VCS PD does not provide justification for not including all the sources of leakage as per methodology. (Refer to question C.3)	(Refer to CL8)	OK
D.3.2. Are all aspects related to direct and indirect baseline emissions captured in the project design?			(See above)	(Refer to CL8)	OK
D.3.3. Have all relevant greenhouse gases and sources been evaluated?			(See above)	(Refer to CL8)	OK
D.3.4. Do the methodologies for calculating baseline emissions comply with existing good practice?			(See above)	(Refer to CL8)	OK
D.3.5. Are the calculations documented in a complete and transparent manner?			(See above)	(Refer to CL8)	OK

D.3.6. Have conservative assumptions been used?		(See above)	(Refer to CL8)	OK
D.4. Emission Reductions Validation of baseline GHG emissions will focus on methodology transparency and completeness in emission estimations.				
D.4.1. Will the project result in fewer GHG emissions than the baseline case?		It is stated in the VCS PD that expected VCUs per annum each project site are as follows: The Siam Cement (Ta Lung) Co., Ltd (Ta Lung): 42,539 tCO₂e The Siam Cement (Ta Lung) Co., Ltd (Khao Wong): 174,840 tCO₂e The Siam Cement (Kaeng Khoi) Co., Ltd: 129,755 tCO₂e The Siam Cement (Thung Song) Co., Ltd: 156,793 tCO₂e The Siam Cement (Lampang) Co., Ltd: 40,200 tCO₂e VCUs expected over 10 year crediting period: 5,441,258 tCO₂e It is found during the validation that reference parameters related to emission reduction calculation are incorrect. Therefore, the expected VCUs per annum require recalculation. (See Table 2, Question 1.8)	GAR5	OK
D.4.2. Is the table showing the aggregate emission reductions included in the VCS PD as per the format in guidance document?		Table showing summary of emission reductions is given in the tabular form is as per format in guidance document.	OK	OK
E. Environmental Impacts It is assessed whether environmental impacts of the project are sufficiently addressed.				

E.1.1. Does host country legislation require an analysis of the environmental impacts of the project activity?		Yes, Environmental Impact Assessment (EIA) report is required for this type of project prior to construction to ensure minimum impacts on the environment and to determine any mitigation measures for any significant impacts. EIA report approval from each site is required to ensure that the significant impacts related to project activities are identified, assessed and fully addressed.	CL12	OK
E.1.2. Does the project comply with environmental legislation in the host country?		(See E.1.1 above)	(Refer to CL12)	OK
E.1.3. Will the project create any adverse environmental effects?		(See E.1.1 above)	(Refer to CL12)	OK
E.1.4. Have environmental impacts been identified and addressed in the VCS PD?		No identification of any environmental impacts in the VCS PD. (See E.1.1 above)	(Refer to CL12)	OK
F. Comments by Local Stakeholder Validation of the local stakeholder consultation process.				
F.1.1. Have relevant stakeholders been consulted?		Stake holders are not clearly identified in the VCS PD, although there is stakeholder consultation dates provided.	CL13	OK
F.1.2. Have appropriate media been used to invite comments by local stakeholders?		Evidences are shown in the EIA of sampling sites (Ta Lung, Kaeng Khoi, Tung Song) that stakeholders were given questionnaires during EIA study for their comments. After implementing the project, there have been events to communicate with stakeholders through complaints received and response system, as well as open factory for community and schools visit.	OK	OK
F.1.3. If a stakeholder consultation process is required by regulations/laws in the host country, has the stakeholder consultation		Stakeholder consultation process is required by regulation in the host country. Evidence whether the process has been carried out	OK	OK

process been carried out in accordance with such regulations/laws?			according to such regulations is shown in the EIA of each site.		
F.1.4. Is a summary of the comments received provided?			Summary of the comments prior to the start of project were provided in EIA of each site, and comments that received later implementing the project activity are received via complaints system and that need to identify in the VCS PD along with corrective actions taken.	GL14	OK
F.1.5. Has due account been taken of any comments received?			(See above)	(Refer to GL14)	OK

TABLE 2: BASELINE AND MONITORING METHODOLOGIES: ACM0003 / Version 07.2

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
1. Baseline Methodology (specific question)					
1.1. Applicability					
1.1.1 Check if the project conforms to applicability of ACM0003 version 07.2 “The methodology is applicable to project activities in the cement industry where fossil fuel(s) used in an existing clinker production facility are partially replaced by one or more carbon intensive fossil fuel(s) and/or alternative fuels”	ACM0003 v. 07.2		The project is a combination of five GHG reduction projects located in five different cement manufacturing units which are listed in paragraph 1.4. All project activities in this group involve partial replacement of fossil fuels by alternative fuels or less carbon intensive fuels in cement manufacture. As per UNFCCC guideline for the CDM project, the proposed projects can be categorised as large-scale project on sectoral scope No.4 “Manufacturing Industries”	OK	OK
1.1.2 Does the project apply to the following conditions: a) A significant investment is required to enable the use of the alternative fuel(s) and/or the less carbon intensive fossil fuel(s);			Justification of the choice of the methodology is presented in the VCS PD section 2.2. (Justification1) A significant investment is required for new machinery installation, including storage,		

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			handling and transporting system to enable the use of alternative fuels and/or the less carbon intensive fossil fuels. Evidences of investment on machine installation and relevant activities are required to support this justification. (Refer to question B.1.4)	(Refer to CL4)	OK
b) During the last three years prior to the start of the project activity, no alternative fuels have been used in the project plant;			(Justification2) According to the fuel consumption work journal during the last three year prior before the start of the project activities, there are no alternative fuels and biomass have been consumed. However a small amount of alternative fuels was used in testing phase of the projects. Work journals of the last 3 years prior to start dates of the grouped project are required to proof transparency of fuel consumption data as claimed in the VCS PD. (Refer to question B.1.4)	(Refer to CL5)	OK
c) The CO2 emissions reduction relates to CO2 emissions generated from fuel combustion only and is unrelated to the CO2 emissions from decarbonisation of raw materials (i.e. CaCO3 and MgCO3 bearing minerals);			Yes. (Justification3) The CO2 emission reductions are only related to the CO2 generated by fuel burning requirement and not by decarbonisation of raw material.	OK	OK
d) The methodology is applicable only for installed capacity (expressed in tons clinker/year) that exists by the time of validation of the project activity.			Yes. (Justification 4) The installed capacity has not changed in each site during the time of validation.	OK	OK
1.1.3 Is the project activity using biomass residues, or			The project activities are using biomass and biomass residues that are not chemically processed prior to	OK	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
renewable biomass?			combustion in the project plant. No renewable biomass is used in any sites.		
1.1.4 Is the project using renewable biomass from a dedicated plantation?			No. No renewable biomass is used in any sites.	OK	OK
1.1.5 In case of using biomass residues: a) Check if the biomass is not chemically processed prior to combustion in the project plant. b) Check if there is any preparation of the biomass, occurring before use in the project activity, that cause other significant GHG emissions (such as, for example, methane emissions from anaerobic treatment of waste water or from char coal production); c) The biomass used by the project facility is stored under aerobic conditions.			a) It is observed at Siam Cement Thung Song that charcoal residues are used and that they are stored under aerobic condition and the period is not more than 1 year. No chemically processes of biomass prior to combustion, however it is processed mechanically by physically mixed into other types of biomass at the project site. b) No other preparation of biomass residue occurring before the project activity that can cause other GHG emissions. c) Yes.	OK OK OK	OK OK OK
1.1.6 Are the applicability conditions outlined in the latest available version of the following tools fulfilled by the project VCS PD? • The “Combined tool to identify the baseline scenario and demonstrate additionality”; • The “Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site”, if B2 is identified as the most	EB28 v.02.2 EB41 v.04		The VCS PD does not clearly identified tools with latest available version.	CL15	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
plausible baseline scenario for the use of biomass residues; • The “Tool to calculate project or leakage CO2 emissions from fossil fuel combustion”; • The “Tool to calculate baseline, project and/or leakage emissions from electricity consumption”. • The baseline and monitoring methodology AM0042 (Only for sectoral scope 1,14)	EB41 v.02				
1.1.7 Check if the project activities implement efficiency measures in production of clinker, such as changing the configuration/number of pre-heaters? <i>If the answer is ‘YES’, then this methodology ACM0003 version 07.2 is NOT applicable.</i>			No.	-	OK
1.1.8 Check if both conditions apply; a) If F2 (the continuation of the current fuel mix) or F3 (a different fossil fuel mix portfolio) results to be the most plausible baseline scenario for the use of fuels in the cement plant, and, b) If one or several of the following scenarios, as explained in the “procedure for the selection of the most plausible baseline scenario and demonstration of additionality”, result to be the most plausible baseline scenario for the use of alternative fuels: • For the fate of any wastes originating from fossil sources: scenarios W1 and/or W3; • For the fate of any biomass residues: scenarios B1, B2 and/or B3;			Yes. Justifications for selection of plausible baseline scenarios are clearly stated in the VCS PD. F2 and F3 scenarios are the most plausible baseline. (Refer to Section 2.4 in the VCS PD) Yes. According to the VCS PD section 2.2, alternative scenarios; W1, W3, and B3, are the most plausible baseline. (Refer to Section 2.4 in the VCS PD)	OK	OK
				OK	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
• For the fate of any renewable biomass: scenario R1.					
1. 2. Project boundary					
1.2.1 Does the physical project boundary cover all production processes related to clinker production, including pre-heaters, pre-calciner, the kiln tube, on-site storage and on-site transportation and drying of alternative fuels (if alternative fuels are used in the project activity), The vehicles used for transportation of alternative fuels to the project site,			Yes. The proposed project activities involve the installation of storage and handling system for alternative fuels and less carbon intensive fuels, including biomass and other alternative fuels. In order to implement the project activities a complete system for receiving, storing, and feeding alternative fuels and less carbon intensive fuels needs to be introduced. (Refer to Section 1.4 of the VCS PD)	OK	OK
1.2.1 a) Where biomass residues are used, the project boundary includes the sites where the biomass residues would be dumped, left to decay or burnt in the absence of the project activity, or not?			1.2.1 a) Biomass residues are used in the project (some project site i.e. Siam Cement Tung Song), Clear clarification for not including these leakages is required to explain in the VCS PD. (Refer to question C.3.1)	(Refer to CL8)	OK
1.2.1 b) Where renewable biomass is used in the project plant, the project boundary also includes the sites where the renewable biomass is cultivated, or not?			1.2.1 b) No renewable biomass is used.	OK	OK
1.2.2 Are any emission sources and gases, included in or excluded from the project boundary, correctly described accordingly to table 1 of ACM0003 version 07.2?			Yes.	OK	OK
1.3. Identification of alternative baseline scenarios					
Refer to 'Procedure for the selection of the most plausible baseline scenario and demonstration of additionality' of ACM0003 version 07.2			-	-	

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
1.3.1 Are the various options for alternatives explained in VCS PD? Are there justifications for selection of the identified plausible baseline scenario explained? Check whether applicability conditions of the methodology are still conformed. (Refer to Q 1.1.8)			Yes. Justifications for selection of plausible baseline scenarios are clearly stated in the VCS PD, section 2.4. The applicability of ACM0003 version 07.2 is conformed.	OK OK	OK OK
1.3.2. Is the explanation of these options transparent and Complete a) Type and quantities of fuels have been used in the cement plant in the most recent three years prior to the start of the project activity; b) Type and quantities of fuels that are supposed to be used under the project activity in the project plant; and which of them are identified less carbon intensive fuels? c) Type, source, and available quantities for each waste type, biomass residue type, and renewable biomass type that is to be used in the project plant under the project activity.			No clear explanation of the followings is included in the VCS PD. a) type and quantities of fuels that were in the most recent 3 years prior to the start of the project activity; b) type and quantities of fuels that have been used under the project activity; c) types, source and available quantities of biomass that have been used under the project activity.	~~CL16~~	OK
1.3.3 Are the calculations for baseline is as per latest version of ACM 0003 as required by this methodology?			Yes, the calculations for baseline methodology are per latest version of ACM0003 version 07.2 as required by this methodology.	OK	OK
1.3.4. Whether the project participant has used the steps as per ACM0003 for defining the baseline scenario?			Yes, the project participant has used the steps as per ACM0003 version 07.2 for defining the baseline scenario.	OK	OK
1.3.9 Did the project participant provide evidence and supporting documents to exclude baseline options that do not comply with legal and regulatory requirements; or depend on key resources such as fuels, materials or technology that are not available at the project site?			None of the plausible options stated in the VCS PD that did not comply with legal and regulatory requirements.	OK	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
1.4. Additionality					
1.4.1. Was the additionality of the project activity demonstrated and assessed using the latest version of “Tool for demonstration and assessment of additionality”? (EB39 version 05.2)	VCS/ EB39 v. 05.2	5.8	According to EB39 version 05.2, additionality tool checklist is; i. Identification of alternatives to the project activity; The PP identifies alternatives to project in section 2.5 of the VCS PD that are F2 “Continuation of current practice, i.e., a scenario in which the company continues cement production using the existing technology, materials and fuel mix” and F3 “The continuation of using only fossil fuels and no alternative fuels, however, with a different fuel mix portfolio, taking into account relative prices of fuels available. The scenarios may be based on one fuel or a different mixes of fuels”. <i>These 2 alternatives are validated on-site and accepted as plausible baseline scenarios for the use of fuels in the cement plant.</i> i. Investment analysis to determine that the proposed project activity is either: 1) not the most economically or financially attractive, or 2) not economically or financially feasible; Investment analysis is not chosen by the PP as stated in the VCS PD that the additionality tool requires either an investment analysis or a barrier analysis. Therefore, a barrier analysis has been conducted for this proposed grouped		

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			project. However in Step 2 b) financial analysis, under Step 2 'barrier analysis' of the proposed VCS PD, claims that the companies have to spend vast money for developing the technologies, including machines, process control system and staff training. Moreover the companies have to take a risk on new modifications and processing conditions which are not operated before. Evidence of major investment on relevant machine and equipments are required to proof this claim. (Refer to question B.1.5) ii. Barriers analysis; In this grouped project, the technological barrier and lack of prevailing practice are considered as two main barriers for the implementation of all project activities. The main technological barriers indentified in the project activity scenario are: a. Due to using rice husks the input of silica into the burner, and consequently into the kiln, is increased. As a consequence of this the chemistry, the process is affected and quality of the clinker could as well be affected.	(Refer to CL6)	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			b. The homogeneous energy flow is crucial for persistently high clinker quality. The homogeneous energy flow is controlled in the process but the energy flow of alternative fuel is not as smooth as fossil fuel. Also biomass fuel has more affinity to moisture which increases the risk of clogging. Therefore the processing control requires much serious and keener observation on behalf of operation and quality personnel. c. To substitute partially of fossil fuels with alternative fuels and biomass residue, there are changes in the raw material component to meet the relevant quality standard. Then the quality and quantity of raw material have been strictly consideration. d. Due to the different type of alternative fuels and the changes in the alternative fuels mix composition used in the clinker production, the disturbance in process is most likely to happen. e. The type of refractory might need to be changed in order to ensure a long life. <i>Technological barriers indentified above are validated during site visit and evidences of disturbance of energy flow have been constantly presented and resulted in adjustment of fuel mix</i>		

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			<i>ratio at each clinker on daily basis, along with occasional occurrence of biomass clogging in fuel feeding system and its regular practice on emergency response protocol as well as preventive maintenance.</i> In addition as stated in the VCS PD, other technological barriers are related to the installation of machines and control system, training for operators and engineers to avoid the fluctuations or instabilities from using alternative fuels and biomass residue for clinker production, and the increasing maintenance cost as well as downtime production associated with the new control system. <i>These additional statements are validated and found evidences of previous training provisions and technological transferred among key persons and main operators within the grouped project.</i> <i>In addition, self innovation on machines and related technologies since year 2004 to present year illustrates how each site has overcome their risk of equipment malfunction that could lead to greater risk on production control.</i> iii. Common practice analysis. It is stated in the VCS PD that the technologies and system used in the project activities is the first implementation in cement manufacture. No		

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			other project activities in cement manufacturing in Thailand concerned to substitute the fossil fuels with alternative fuels and biomass residue in cement processing on that period. Therefore, there is no similar option occurring before this group project in cement manufactures in Thailand and this grouped project is the first of its kind in Thailand. Transparent and documented evidences of year 2002 when start using biomass substitution of fossil fuel at Keang Khoi site, to support barrier of prevail practice and also the first of its kind, are required. (Refer to question B.1.5) <u>Note:</u> The type of evidence to be provided should include at least one of the following: (a) Relevant legislation, regulatory information or industry norms; (b) Relevant (sectoral) studies or surveys (e.g. market surveys, technology studies, etc) undertaken by universities, research institutions, industry associations, companies, bilateral/multilateral institutions, etc; (c) Relevant statistical data from national or international statistics; (d) Documentation of relevant market data (e.g. market prices, tariffs, rules); (e) Written documentation of independent expert judgments from industry, educational institutions (e.g. universities, technical schools, training centres), industry associations and others.	(Refer to CL6)	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
1.4.2 In addition to approved methodology, does the project proponent demonstrate additionality using one of the following test; a) Test 1 – the project test b) Test 2 – performance test c) Test 3 – technology test	VCS 2007.1 clause 5.8 Additionality		The project proponent uses “Combined tool to identify the baseline scenario and demonstrate additionality”. (Section 2.5 of the VCS PROJECT DESCRIPTION) (EB28 v.02.2)	OK	OK
1.4.3. Was investment barrier taken into consideration? If ‘YES’, was the bench mark investment analysis done covering steps in 2b, 2c and 2d of the additionality tool? Or, Does the project demonstrate capital or investment return constraints that can be overcome by traditional revenues associated with the generation of VCUs?	EB39 version 05.2 VCS 2007.1 clause 5.8		No. The investment barrier is not chosen in the VCS PD, however there is a small section of financial analysis presented in Step 2 ‘Barrier analysis’ in section 2.5 of the VCS PD. Evidences for financial barriers and technology barriers are required from each site to prove that the grouped project is additional. (Refer to question B.1.5)	~~(Refer to CL6)~~	OK
1.4.4 Is it demonstrated that the project activity is not common practice in the relevant country and sector by applying Step 4 (common practice Analysis) of “ Tool for demonstration and assessment of additionality ” (EB39 version 05.2)?	EB39 version 05.2		It is stated in Step 4 ‘Common practice analysis’ in section 2.5 of the VCS PROJECT DESCRIPTION that there were no other activities similar to the project activity in Thailand before 2002. However, no demonstration is provided in the VCS PD. Transparent and documented evidences of year 2002 when starting of using biomass substitution of fossil fuel at Keang Khoi site to support barrier of prevail practice and also the first of its kind, are required. (Refer to question B.1.5)	OK ~~(Refer to CL6)~~	OK OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
1.5 Project Emissions (specific to methodology)					
1.5.1 Are project emissions clearly identified in the VCS PD?	ACM 0003 v.07.2		Yes. The project emissions described in section 4.1 of the VCS PD are considered as CO2 from the use of alternative fuels, additional electricity, fossil fuel consumption as a result of the project activity, combustion of fossil fuels for transportation of alternative fuels.	OK	OK
1.5.2 Are project emissions taken from emission sources and gases that included in the project boundary, correctly described accordingly to table 1 of ACM0003 version 07.2?	ACM 0003 v.07.2		Yes.	OK	OK
1.5.3 Is project emissions calculation correct, and quantified in tCO2e?	ACM 0003 v.07.2		<i>No, the calculation is incorrect as data do not cover all project activities found during on-site validation, and data of alternative fuel consumption during the crediting period (2006-2007) can not be validated to ensure correctness.</i>	~~(Refer to CL7 and CAP3)~~	OK
1.6. Baseline Emissions (specific to methodology)					
Are baseline emissions taken from emission sources and gases that included in the project boundary, correctly described accordingly to table 1 of ACM0003 version 07.2?	ACM 0003 v.07.2		Yes. Baseline emissions are CO2 from alternative fuels and CH4 emissions from preventing disposal or uncontrolled burning of biomass residues, as described in section 4.1 of the VCS PD.	OK	OK
Is baseline emissions calculation correct, and quantified in tCO2e?	ACM 0003 v.07.2		Work journals of the last 3 years prior to start dates of the grouped project are required to proof transparency of fuel consumption data and correct calculation of baseline emission, as claimed in the VCS PD.	~~(Refer to CL5)~~	OK
1.7. Leakage (specific to methodology)					
Are leakage emissions presented from possible	ACM		The VCS PD does not provide justification for not	~~(Refer to~~	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
sources, and included in calculation? Sources are, a) From biomass residues: The diversion of biomass residues from other uses to the project plant, may result in increase in emissions from fossil fuel combustion in the project activity. b) From less carbon intensive fossil fuel(s): Leakage may result from fuel extraction, processing, liquefaction, transportation, re-gasification, and distribution of fossil fuels outside of the project boundary.	0003 v.07.2		including all the sources of leakage as per methodology. (Refer to question C.3)	~~CL8)~~	
Are steps for leakage emissions calculation conformed to ACM0003 version 07.2 methodology?	ACM 0003 v.07.2		See above		
1.8. Emission Reduction (specific to methodology)					
Are emission reductions calculated correctly according to ACM0003 version 07.2 and quantified in 1CO ₂ e/year?	ACM 0003 v.07.2 / eq 24		No. Calculation sheet provided with the VCS PD refers to some data that are different from the actual primary records, and does not cover all possible sources of project emission, such as transportation within the site boundary from biomass collection site to preparation area and trucks that used in grinding and feeding biomass into shredding machines, self electricity consumption of machines and equipment in preparation process i.e. wood chipping, shredding, dryer and conveyors, fossil fuel used in warming and start-up of clinker burners, etc.	~~(Refer to GAR4)~~	OK
			It is found during the validation that reference parameters related to emission reduction calculation	~~(Refer to GAR5)~~	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			are incorrect. Therefore, the expected VCUs per annum require recalculation.		
Has baseline scenario changed at the renewal of the crediting period?	VCS	6.3	<i>Not applicable.</i>	-	OK
2. Monitoring Methodology (specific to methodology)					
2.1. Applicability (specific to methodology)					
Are all the monitoring provisions contained in the tools referred to in this methodology followed?	ACM 0003 v.07.2		Only where applicable to the baseline and project activity, the monitoring provisions are clearly stated in the VCS PD section 3.3.	OK	OK
If applicable, does the project follow the provisions regarding data and parameters <u>not monitored</u> ?	ACM 0003 v.07.2		Yes.	OK	OK
2.2. Monitoring Methodology (specific to methodology)					
Does the monitoring plan cover the primary parameters given under to be monitored during the crediting period?	ACM 0003 v.07.2		Yes.	OK	OK
Are all data collected as part of monitoring archived electronically and kept at least for 2 years after the end of the last crediting period?	ACM 0003 v.07.2		(See C.5.6 above)	(Refer to GL10)	
Are all monitoring procedures described in the VCS PD?	ACM 0003 v.07.2		it is described in the VCS PD all monitoring parameters, however it does not include 'type of measurement instrument used', 'the responsibilities	GL17	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
Does it include 'type of measurement instrument used', 'the responsibilities for monitoring', and QA/QC procedure that will be applied?			for monitoring', and QA/QC procedure that will be applied.		
2.3. Quality Control (QC) and Quality Assurance (QA) Procedures (specific to methodology)					
Did all measuring equipments are calibrated and regular checked for their functioning?	ACM 0003 v.07.2		Evidences of measuring equipment calibration and plan from each site are required, as they were not completely provided during on-site validation.	CL18	OK
Are the data double-checked for correctness, and against commercial data (if applicable)?	VCS	6.5. 4	<i>Not applicable.</i>		

TABLE 3: LEGAL REQUIREMENTS

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
1. Legal Requirements					
1.1 Is the project activity environmentally licensed by the competent authority?			Evidences of EIA report approvals of each site from the office of natural resources and environmental policy and planning, Thailand, are required.	(refer to CL9)	OK
1.2 Check if all the conditions of the environmental license are being met.			(See above)		

TABLE 4: RESOLUTION OF CORRECTIVE ACTION AND CLARIFICATION REQUESTS

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1 and 2	Summary of project owner response	Validation team conclusion
The VCS 2007.1 definition for project start date has been changed from the “date on which the project reached financial closure” to “the date the project activity began reducing or removing GHG emissions”. Evidences collected from sampling sites; Kaeng Khoi, Khao Wong, Thung song, does not conform to the start date referred in the VCS PD as above.	CAR 1 / Question A.1.2	The start date for all project sites have been corrected in section 1.6 in revised VCS PD which coherent with the evidences proposed by project owner and the evidences will be attached to DOE.	OK. CAR 1 is closed. The definition of Project Start Date in VCS 2007.1 is “Date on which the project began reducing or removing GHG emissions”. The evidence of project start date were operation daily reports in each site and corrected as written in VCS PD as Project starting dates of each site in the grouped project activities are different as stated below; The Siam Cement (Kaeng Khoi) 04/10/2002 The Siam Cement (Ta Luang) 15/10/2002 The Siam Cement (Khao Wong) 30/09/2004 The Siam Cement (Lampang) 30/04/2004 The Siam Cement (Thong Song) 19/01/2003

(Justification6) This statement is wrongly quoted in the VCS PD as it is observed at Siam Cement Thung Song that charcoal residues are used and that it is stored under aerobic condition, although period is not more than 1 year.	CAR 2 / Question B.1.4	The statement has been corrected in revised VCS PD.	OK. The CAR 2 is closed. The statement has been corrected in revised VCS PD as in 2.2 , “All biomass residues used in the project plants are stored under aerobic condition and it is stored for not more than one year.”
The provisions made for archiving project emission data are not sufficient. The records of alternative fuels consumption that used in calculation emission reduction during 2006 – 2007, cannot be archived and validated.	CAR 3 / Question C.2.4 / Table 2 Question 1.5.3	The primary source of biomass residue consumption during 2006-2007 that used for calculation of emission reduction is provided to DOE.	OK. The primary sources of biomass residue consumption during 2006-2007 were related with Work Journals Documents which provided data for their calculation sheet. Hence CAR 3 is closed.
Calculation sheet provided with the VCS PD refers to some data that are different from the actual primary records, and does not cover all possible sources of project emission, such as transportation within the site boundary from biomass collection site to preparation area and trucks that used in grinding and feeding biomass into shredding machines, self electricity consumption of machines and equipment in preparation process i.e. wood chipping, shredding, dryer and conveyors, fossil fuel used in warming and start-up of clinker burners, etc.	CAR 4 / Question D.1.4 / Table 2 Question 1.8	Revised calculation sheet is provided.	OK. Please reference to the calculation sheet for each site. Hence CAR 4 is closed.

It is found during the validation that reference parameters related to emission reduction calculation are incorrect. Therefore, the expected VCUs per annum require recalculation.	CAR 5 / Question D.4.1 / Table 2 Question 1.8	The expected VCUs is provided in the revised VCS PD.	OK. As in VCS PD Version 02, Expected VCUs per annum by each project site as follows: The Siam Cement (Ta Lung) Co., Ltd. (Ta Lung): 32,948 tCO ₂ e The Siam Cement (Ta Lung) Co., Ltd. (Khao Wong): 175,019 tCO ₂ e The Siam Cement (Kaeng Khoi) Co., Ltd.: 239,771 tCO ₂ e The Siam Cement (Thong Song) Co., Ltd.: 121,635 tCO ₂ e The Siam Cement (Lampang) Co., Ltd.: 40,857 tCO ₂ e VCUs expected over 10 year crediting period: 6,102,304 tCO ₂ e Hence CAR 5 is closed.
According to on-site validation conducted on 11,12 and 15 th June,2009, each site has slight differences in equipments installed, type of biomass and additional process to preparation of biomass before feeding into cement kilns. Therefore, clear flowchart and description of technology and activities related to each site installation, storage and handling are needed to be clarified in the VCS PD.	CL 1 / Question A.1.1	The flowchart, technology, system modification and activities in each site have been described in revised VCS PD.	OK. As show in section 1.8 Project technologies, products, services and the expected level of activity: Hence CL 1 is closed.
Evidence of the proof of ownership has not been received during the validation.	CL 2 / Question A.1.3	The company affidavit is used as the evidence to proof the ownership of the project activity. It will be provided to the DOE.	OK. The company affidavit is used as the evidence to proof the ownership of the project activity. Hence CL 2 is closed.

Letter of confirmation from project proponents has not been received during on-site validation.	CL 3 / Question A.1.5	The letter of confirmation from project owner is used as evidence that will be provided to the DOE.	OK. The letter of confirmation from project owner is used as evidence. Hence CL 3 is closed.
(Justification1) Evidences of investment on machine installation and relevant activities are required to support this justification.	CL 4 / Question B.1.4 / Table 2 Question 1.1.2 a)	Evidences of investment on machine installation and relevant activities are provided to the DOE.	OK. Table 11: Approximate investment to implement the use of biomass residue in each site The Siam Cement (Kaeng Khoi) 89.44 Mbaht The Siam Cement (Ta Luang) 26.01 Mbaht The Siam Cement (Khaowong) 31.69 Mbaht The Siam Cement (Lampang) 8.20 Mbaht The Siam Cement (Thong Song) 149.56 Mbaht Hence CL 4 is closed.
(Justification2) Work journals of the last 3 years prior to start dates of the grouped project are required to proof transparency of fuel consumption data and correct calculation of baseline emission, as claimed in the VCS PD.	CL 5 / Question B.1.4 / Table 2 Question 1.1.2 b), 1.6	Work journals of the last 3 years prior to start dates of the grouped project are provided to the DOE.	OK. Work journals of the last 3 years prior to start dates of each site were provided and reported fuel consumption data as claimed in the VCS PD. Hence CL 5 is closed.

Evidences for financial barriers and technology barriers are required from each site to prove that the grouped project is additional. Transparent and documented evidences of year 2002 when start using biomass substitution of fossil fuel at Kaeng Khoi site, to support barrier of prevail practice and also the first of its kind, are required.	CL 6 / Question B.1.5 / Table 2 Question 1.4.1, 1.4.3, 1.4.4	The evidences for technology barriers, the first of its kind and financial barriers are provided to DOE. Evidences provided are; 1. A critical analysis report of production since start year of the project to current year, at each site. 2. Factory permits (type 101) from local authority to Kaeng Khoi factory, Khaowong factory, TaLuang factory, Lampang and Thung song factory. 3. Environmental performance report of SCG year 2001. 4. Sustainable development report year 2003. 5. Project proposal and report on investment cost of each site.	OK. CL 6 is closed. There was a critical analysis report of production since start year of the project to current year, at each site. It was reported on technical problems occurred as a result of biomass feeding. Trial and errors practices in modifying machine, adjusting operating condition, and other problems were recorded. It is a proof that skilled and/or properly trained labour to operate and maintain the technology was not available at the starting year which leads to an unacceptably high risk of equipment disrepair and malfunctioning or other underperformance. This report also shows the development details of technology in order to overcome each technical problem. Relevant legislation of biomass and other waste disposal in cement kiln is used as a proof to first of its kind for this grouped project. The dates of approval stated in the registration of "factory permit (type 101)" from local authority to Kaeng Khoi factory site which was the first authorized factory in Thailand to disposal waste (Biomass and other wastes) by their designed technology in 2001. The registered permit was authentic and can be rechecked at the department of industrial work, Ministry of Industry, Thailand. There was a supporting statement announced in a public available document "Environmental performance report of SCG year 2001", and a "sustainable development report year 2003". The evidence of Financial Barriers was validated using project proposal and report on investment cost of each site. This evidence is a proof that large investment was a risky option from a business point of view.
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Evidenced of log sheets of biomass consumption, clinkers production, and evidences of additional electricity, and fuels used for transportation of biomass (to the project sites and within the sites) during 2006 – 2007 are required to validate the completeness and correctness of emission indicators and its measurement data.	CL 7 / Question C.2.2 / Table 2 Question 1.5.3	The evidences will be provided to DOE.	OK. The documents were provided as log sheets of biomass consumption, clinkers production, and evidences of additional electricity, and fuels used for transportation of biomass (to the project sites and within the sites) during 2006 – 2007 are correctness as in calculation sheet and monitor data. Hence CL 7 is closed.
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Clear clarification for not including these leakages is required to explain in the VCS PD.	CL 8 / Question C.3.1, D.2 / Table 2 Question 1.2.1 a), 1.7	Leakage clarification is including in the revised VCS PD. L₂ have been demonstrated as the leakage option for these project activities. Then a leakage penalty is not applicable for this group of project. The evidence of ultimate supplier and related evidences will be provided to DOE. Evidences provided are; 1. The report of evaluation of biomass potential from DEDE, 2005. (Department of Alternative Energy Development and Efficiency, Ministry of Energy) data of biomass availability which is available in website (in local language). http://www.dede.go.th 2. Report on the research of “Energy Potential from Residual Biomasses in Thailand”, Environmental Ecological and Energy Department, Thailand Institute of Scientific and Technological Research, 2007. (note: this research stated percentage of rice husk used in Thailand was 70-80% of the amount availability in 2007) http://www.energy-based.nrct.go.th/Article/Ts-3%20energy%20potential%20from%20residual%20biomass%20in%20thailand.pdf	OK. CL8 is closed. The report of evaluation of biomass potential from DEDE, 2005 (Department of Alternative Energy Development and Efficiency, ministry of Energy) was provided to support the description in VCS PD as Leakage penalty is not applicable for this group of project as “Demonstrate that there is an abundant surplus of the biomass residue in the region of the project activity which is not utilized. For this purpose, demonstrate that the quantity of available biomass residue of type k in the region is at least 25% larger than the quantity of biomass residue of type k that is utilized (e.g for energy generation or as feedstock), including the project plant. The availability of biomass, especially rice husk, in each period of verification will be validated through report from Department of Alternative Energy Development and Efficiency, ministry of Energy, and related researches. http://www.dede.go.th
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There is existing procedure in the ISO9001 documentation identified for training of monitoring personnel on each site; however it does not cover records of on-the-job training that all sites provided for qualifying of all personnel involved in this project.	CL 9 / Question C.5.3 / Table 3 Question 1.1	The revised ISO9001 training procedure will be provided to DOE later in verification period.	OK. The training records of concerned staff for applicable procedures of project and technology were clearly recorded. Hence CL9 is closed.
The existing procedures in the ISO9001 documentation do not provide clear identification for monitoring, measurement, and reporting of relevant data and emission calculation, as well as dealing with possible data adjustments un uncertainty.	CL 10 / Question C.5.6, C.5.8	In the revised VCS PD, the on-site staffs are responsible for data collection and it is centralized at the SCG's engineering department. The emission calculation and emission monitoring report will be issued by the consultant – South Pole Carbon Asset Management Ltd. It will be included in ISO 90001 later on.	OK. The procedures and all documents were revised and written cover monitoring, measurement, and reporting of relevant data and emission calculation, as well as dealing with possible data adjustments uncertainty. The code of revised procedure in each site were controlled and effective on 1/12/09 as SKK : WIEO 038 STL(TL) : G-WI-TK 030 STL(KW) : G-WI-P010 STS : W-P-OO-007 SLP : W-P-OO-002(05) Hence CL10 is closed.
There is existing procedure in the ISO9001 documentation identified for control of quality records, <u>however</u> it is found during validation that the maximum retention period of quality records are set at 3 years, therefore, some primary records to calculate baseline emission before year 2006 are removed from the system.	CL 11 / Question C.5.7	The work Journal in each site is provided to DOE as primary records to calculate baseline emission before year 2006.	OK. The retention time of record was revised and data will be kept in electronic system. Hence CL11 is closed.

EIA report approval from each site is required to ensure that the significant impacts related to project activities are identified, assessed and fully addressed.	CL 12 / Question E.1.1	The significant impact related to project activities is indentified in EIA report which is approved by ONEP. The approval EIA each site is provided to DOE as evidence.	OK. EIA report of all sites shows that they comply with local laws and no significant environmental impacts. Hence CL12 is closed.
Stake holders are not clearly identified in the VCS PD, although there is stakeholder consultation dates provided.	CL 13 / Question F.1.1	The section 6 –Stakeholders Consultation—is uVCS project descriptionated in the revised VCS PD.	OK. Referred to section 6 of the VCS PD version 02 – Stakeholders Consultation were conducted as the following dates; The Siam Cement (Kaeng Khoi) 22/11/1999 The Siam Cement (Ta Luang) 01/11/1999 The Siam Cement (Khaowong) 23/12/1999 The Siam Cement (Lampang) 27/09/2001 The Siam Cement (Thong Song) 22/02/2002 Hence CL13 is closed.

Summary of the comments prior to the start of project were provided in EIA of each site, and comments that received later implementing the project activity are received via complaints system and that need to identify in the VCS PD along with corrective actions taken.	CL 14 / Question F.1.4, F.1.5	The comment survey of environmental impact later implementing the project activity was conduct in Kaeng Khoi site as a trail program. Moreover in SCG's sustainability report in 2006-2007 shows that there are no any complain about impact from the project activity. Also during the operation the environmental assessment is used to identify the environmental impact at source in all project activity sites. The evidence is provided to DOE later.	OK. The evidence was SCG's sustainability report in 2006-2007 shows that there were no any complain about impact from the project activity. Hence CL14 is closed.
The VCS PD does not clearly identified tools with latest available version.	CL 15 / Table 2 / Question 1.1.6	According to the Methodology ACM0003, the "Combined tool to identify the baseline scenario and demonstrated additionality, version 02.2 is used. It is in section 2.5 in VCS PD.	OK. According to the Methodology ACM0003, the "Combined tool to identify the baseline scenario and demonstrated additionality, version 02.2 is used. It is in section 2.5 in VCS PD. Hence CL15 is closed.
No clear explanation of the followings is included in the VCS PD. a) type and quantities of fuels that were in the most recent 3 years prior to the start of the project activity; b) type and quantities of fuels that have been used under the project activity; c) types, source and available quantities of biomass that have been used under the project activity.	CL 16 / Table 2 / Question 1.3.2	a) Type and quantities of fuels that were used in the most recent 3 years prior to the start of the project activity is provided in section 1.7 in VCS PD version 2. b) Type and quantities of fuels that have been used under the project activity each site is indentified in revision of VCS PD. c) Source and available quantities of biomass residue is identified in revised VCS PD.	OK. CL16 is closed as responses have been done in the VCS PD Version 02.

it is described in the VCS PD all monitoring parameters, however it does not include 'type of measurement instrument used', 'the responsibilities for monitoring', and QA/QC procedure that will be applied.	CL 17 / Table 2 / Question 2.2	It is described in revised VCS PD.	OK. VCS PD Version 02 have written about 'type of measurement instrument used', 'the responsibilities for monitoring', and QA/QC procedure that will be applied. Hence CL17 is closed.
Evidences of measuring equipment calibration and plan from each site are required, as they were not completely provided during on-site validation.	CL 18 / Table 2 / Question 2.3	The weight measurement calibration each site will be provided to DOE.	OK. The weight measurement calibration reports in each site were suitable as their plan and calibration method. Hence CL18 is closed.
Forward Action Request for Verification Period			
FAR01: The expected VCU per annum in each site should be verified with their operation log sheet to monitor all their data and parameters as stated in VCS PD for project emission. Current observation was made to biomass consumption data that were taken from Work Journal.	Refer to response to CAR 5	-	To be followed up in verification period
FAR02: The actual implementation of the written procedure for data control and other related documents should be verified.	Refer to response to CL 10	-	To be followed up in verification period

Annex B – Curricula Vitae of the Validation Team Members

Team leader and lead verifier : Ashok Mammen - PhD (Oils & Lubricants)

Bureau Veritas Certification - Internal Technical Reviewer

Over 20 years of experience in chemical and petrochemical field. Dr. Mammen is a lead auditor for environment, safety and quality management systems. He is also a lead verifier and tutor for GHG projects and has been involved in the validation and verification processes of more than 60 CDM/JI/VCS and other GHG projects.

Internal Technical Reviewer: Ms. Burcu Mutman – Environmental Engineer

Bureau Veritas Certification – Senior Technical Specialist

Burcu Mutman is an auditor for environment, safety and quality management systems.

She is also lead verifier for GHG projects. Bureau Veritas Certification Holding SAS – Internal Technical Reviewer

Team member and verifier : Ms. Wiriya Rattanasuwan – Chemical Engineer

Bureau Veritas Certification – Validator (Thailand based) / Lead auditor

Wiriya Rattanasuwan is an auditor for environment, safety and quality management systems.

She is also validator and verifier for GHG projects. She has been involved in the validation process of 8 CDM projects.

Team member and verifier : Ms. Busarawan Jongjai – Chemical and Environmental Scientist

Bureau Veritas Certification – Validator (Thailand based) / Lead auditor

Busarawan Jongjai is a senior auditor for environment, safety and quality management systems.

She is also validator for GHG projects. She has been involved in the validation process of 4 CDM projects.

Abbreviation List

CAR	-	Corrective Actions Request
CL	-	Clarification
DEDE	-	Department of Alternative Energy Development and Efficiency, Ministry of Energy, Thailand
DOE	-	Designated Of Entity (Bureau Veritas Certification Holding SAS)
EIA	-	Environmental Impact Assessment
FAR	-	Forward Action Request
ONEP	-	Office of Natural Resources and Environmental Policy and Planning
PP	-	Project Proponent (SCG Cement Co.,Ltd)
SCG	-	Siam Cement Group (SCG Cement Co.,Ltd)
VCS PD	-	VCS project description

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