CLEAN DEVELOPMENT MECHANISM
PROJECT DESIGN DOCUMENT FORM (CDM-SSC-PDD)
Version 03 - in effect as of: 22 December 2006

CONTENTS

Annexes

Revision history of this document

Version Number	Date	Description and reason of revision
01	21 January 2003	Initial adoption
02	8 July 2005	• The Board agreed to revise the CDM SSC PDD to reflect guidance and clarifications provided by the Board since version 01 of this document. • As a consequence, the guidelines for completing CDM SSC PDD have been revised accordingly to version 2. The latest version can be found at <http://cdm.unfccc.int/Reference/Documents>.
03	22 December 2006	• The Board agreed to revise the CDM project design document for small-scale activities (CDM-SSC-PDD), taking into account CDM-PDD and CDM-NM.

SECTION A. General description of small-scale project activity

A.1 Title of the small-scale project activity:

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Body Coal and Clamp Kiln Fuel Switch at Allbrick, South Africa
Version Number: 9
Date: 21 October 2011

A.2. Description of the small-scale project activity:

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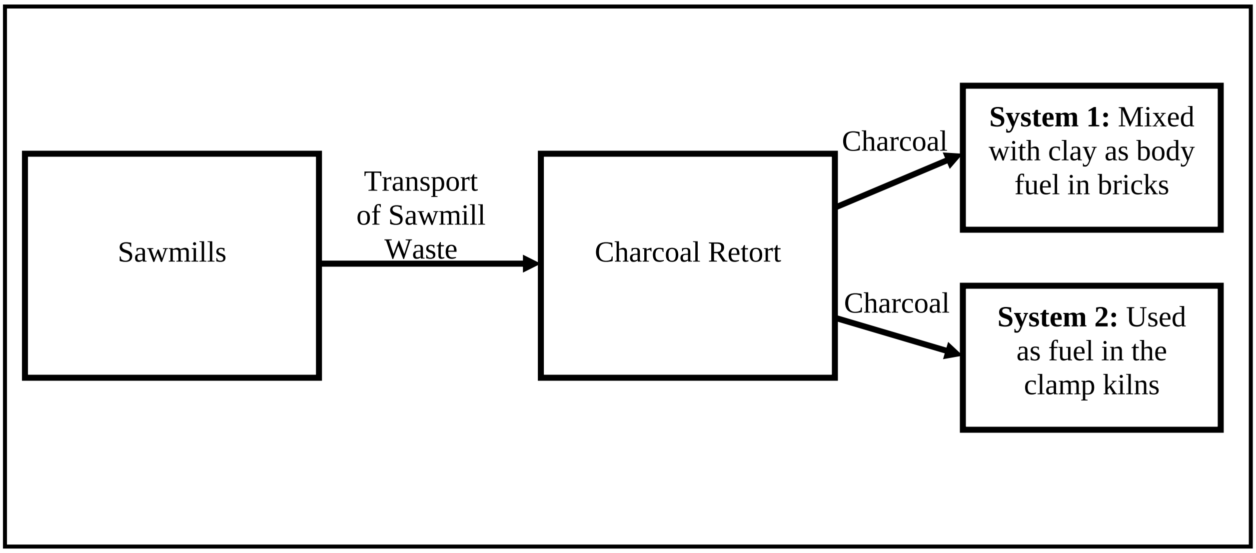
Allbrick Manufacturing and Marketing (Pty) Ltd (trading as Allbrick and further referred to as Allbrick in this document) in George, South Africa produces clay bricks using clamp kiln technology. Historically, the clamp kilns have been fired with coal transported from the Limpopo Province (over 1,200 km away).

The project involves a fuel switch from coal to charcoal both in the clamp kilns and as the body fuel in the bricks. The charcoal is produced using wood waste from local sawmills. This wood waste is classified as renewable biomass in accordance with Annex 18, EB 23:

'The biomass is a biomass residue and the use of that biomass residue in the project activity does not involve a decrease of carbon pools, in particular dead wood, litter or soil organic carbon, on the land areas where the biomass residues are originating from.'

Basic diagrams of the fuel switch project and the Allbrick factory operations before project implementation are presented below:

Allbrick Site



This project will result in Allbrick being the only clay brick producer in South Africa to manufacture bricks entirely from renewable fuels[1]. The bricks produced using the charcoal meet and exceed the SANS 227[2] Specification.

The fuel switch reduces greenhouse gas (GHG) emissions because a fossil fuel (coal) is replaced with a renewable fuel (charcoal). In addition to reducing GHG emissions, the project makes positive contributions to sustainable development. The South African Designated National Authority (DNA) evaluates sustainability in three categories: Economic, environmental and social. The contribution of the project towards sustainable development in South Africa is discussed in terms of these three categories:

Economic:

- The project will contribute to foreign reserve earnings for South Africa via the carbon credit sales revenue.
- The project will result in the first clay bricks produced with renewable fuels in South Africa. A new standard in renewable building practices could be set with the use of bricks from Allbrick.

Environmental:

- The project reduces the amount of wood waste that is stockpiled thereby reducing the risk of fires.
- The use of the stockpiled wood waste avoids methane emissions generated during the anaerobic decomposition of the biomass.
- The project will reduce greenhouse gas (GHG) emissions from coal combustion and the associated environmental consequences. These consequences include: the impact of coal mining, SO_2 emissions from the combustion of coal and the impacts associated with the disposal of coal ash.

Social:

- A move to green jobs by training employees on the benefits of switching from a coal-fired
- process to a charcoal-fired process.
- Job creation for employees that operate the charcoal producing retorts.

A.3. Project participants:

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Name of Party involved (*) ((host) indicates a host Party)	Private and/or public entity(ies) project participants (*) (as applicable)	Kindly indicate if the Party involved wishes to be considered as project participant (Yes/No)
South Africa (host)	Allbrick Manufacturing and Marketing (Pty) Ltd	No
South Africa (host)	Nedbank Ltd	No
(*) In accordance with the CDM modalities and procedures, at the time of making the CDM-PDD public at the stage of validation, a Party involved may or may not have provided its approval. At the time of requesting registration, the approval by the Party(ies) involved is required.		
Note: *When the PDD is filled in support of a proposed new methodology (forms CDM-NBM and CDM-NMM),* at least the host Party(ies) and any known project participant (e.g. those proposing a new		

[1] Letter from the Clay Brick Association of South Africa confirming this statement is in Annex 5.

[2] South African National Standard 227 *Burnt Clay Masonry Units*

methodology) shall be identified.

A.4. Technical description of the small-scale project activity:

A.4.1. Location of the small-scale project activity:

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A.4.1.1. Host Party(ies):

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South Africa

A.4.1.2. Region/State/Province etc.:

>>
Western Cape

A.4.1.3. City/Town/Community etc:

>>
George

A.4.1.4. Details of physical location, including information allowing the unique identification of this small-scale project activity :

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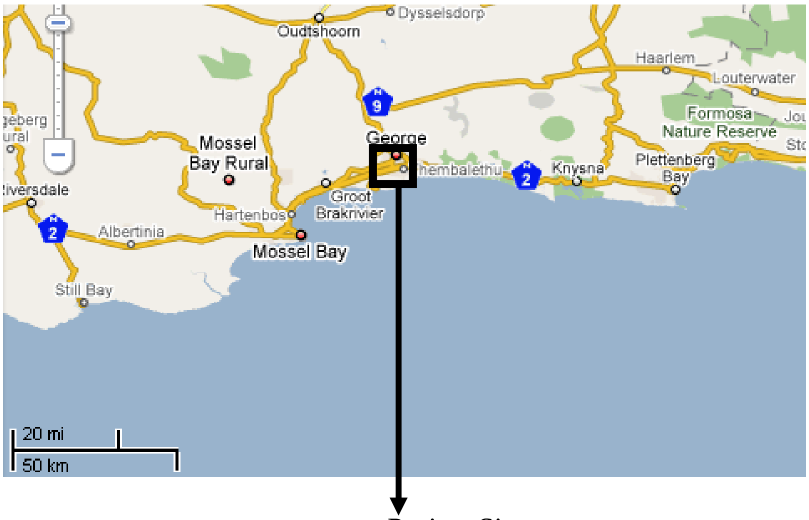
Allbrick is located at:
44 13th Street
Thembalethu
George

The GPS co-ordinates for the site are:
34° 00' 25 S
22° 28' 46 E

The location of the project site is shown below:

Project Site
Figure 1: The Allbrick Factory is situated in George, South Africa



Project Site
Figure 2: The Location of the Allbrick Factory (http://maps.google.com)

A.4.2. Type and category(ies) and technology/measure of the small-scale project activity:

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This project is a fuel switch from coal to charcoal at a clay brick manufacturer. This project is applying for registration under AMS III.Z.: *'Fuel switch, process improvement and energy efficiency in brick manufacture'* (Sectoral scope 4, Version 3). The charcoal and brick production processes are described below:

Charcoal Production

Allbrick entered the charcoal market in October 2008 supplying mainly the agricultural biochar and home cooking markets.

Wood waste from the local sawmills is used as the raw material in charcoal production. The wood waste is delivered to the Allbrick factory where a small stockpile is kept on site. Once on site, the larger pieces of wood are cut into sizes that the charcoal retorts can process.

The wood is placed in drums that are fed into the charcoal retorts. Charcoal is made by burning a carbon-rich material in an oxygen-constrained environment. Combustion is started using a small amount of LPG and once the wood is lit, is self sustaining. The manufacturing process involves heating the wood slowly to burn off the gases and volatiles. The wood is carbonized by heating to approximately 500°C in the absence of air. The wood is sprayed with water to stop the exothermic reaction and to cool the charcoal. The charcoal is allowed to cool further in a stockpile.

There are currently six charcoal retorts at Allbrick. The first two retorts were purchased in October 2008 for the production of biochar. In addition, some charcoal was produced to test entry into the charcoal market. This is further demonstrated by the negotiations and eventual supply contract with Cadac for charcoal. Once these preliminary tests proved successful, Allbrick invested in the steel to construct a third retort prior to the completion of the test period. The third retort was designed and constructed by Allbrick. This technology is more efficient and requires less cleaning than the first two retorts. Three further Allbrick retorts were built from November 2009 to December 2009 to expand charcoal production for use in the firing of the bricks, the brick body fuel and to be sold into the South African charcoal market.

Brick Production

Allbrick manufactures clay bricks using the following process:

Clay is mined on site at Allbrick. The clay is mixed with water, lignosulphonate and charcoal. Charcoal is added as body fuel in the bricks to assist in the brick baking process. Roughly 3.5 - 4 mass% charcoal is added to the mixture. Despite the switch from coal to charcoal the carbon content in the bricks has remained the same. Therefore the nature of the bricks does not change from the baseline to the project case. Bricks are extruded from the clay mixture. All bricks are cut to the same size and the off-cuts of the brick mixture are recycled and mixed into new bricks before the mixture dries. The extruded bricks are then dried. The brick drying system is not being modified or retrofitted by the project activity. The drying process takes approximately a week.

When the bricks are suitably dry they are packed in clamp kilns. Clamp kilns are temporary kilns that are erected using the bricks that are being fired. The kiln remains erected until the bricks have been fired and have cooled. Once this has occurred, the bricks are removed and the clamp kiln is disassembled. The next set of bricks will be fired in a new clamp kiln.

Charcoal is used as the fuel to fire the bricks and is placed in the lattice of the clamp kilns. The lattice is the grid-like arrangement at the bottom of the kiln. The clamp kilns are sealed and the charcoal is lit. The bricks bake for 2.5 weeks and then cool for 1 to 1.5 weeks.

The number of the bricks in the kilns vary from 350 000 to 450 000. However, the average is generally to use 400 000 bricks per clamp kiln. The yield of saleable bricks from the clamp kilns varies between 75 and 80%. The bricks are packed in pallets and transported to buyers.

The maximum brick production occurred in July 2007[3] when over 4 million bricks were extruded that month at Allbrick. This is the maximum monthly production capacity and the fuel switch project does not influence this capacity.

As the result of the fuel switch, some technology changes were implemented on the clamp kilns at Allbrick. For example, the design of the clamp kilns had to be modified to limit the air flow into the clamp kilns; extending the time the charcoal burns since it burns hotter and for a shorter period of time than coal.

Training and Job Creation

Allbrick employed people from the surrounding area (Tembalethu) to work in the charcoal production process. The employees have been through a training program describing the charcoal production process and equipment used in the process. A training register is kept as a record of all employees that have completed the training[4]. Training is repeated once yearly in writing and verbally every three months.

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[3] Coal used and monthly brick production was provided at Validation.

[4] Copies from the training register and training program were provided at validation.

Modifying the clamp kilns to allow firing the bricks with charcoal required on the job training. As there are no precedents to brick production with charcoal, it was a process of trial and error. The success or failure of the process was established in arrears with laboratory tests. During this period large amounts of off specification product was produced. The employees, supervisors and management at Allbrick experienced on the job training and the results of the successful fuel switch have been recorded and reproduced in subsequent brick production with charcoal in clamp kilns at all brick.

A.4.3 Estimated amount of emission reductions over the chosen crediting period:

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Years	**Annual estimation of emission reductions in tonnes of CO_2e**
1	5,604
2	5,604
3	5,604
4	5,604
5	5,604
6	5,604
7	5,604
8	5,604
9	5,604
10	5,604
Total estimated reductions (tonnes of CO_2e)	56,043.99
Total number of crediting years	**10**
Annual average over the crediting period of estimated reductions (tonnes of CO_2e)	**5,604**

A.4.4. Public funding of the small-scale project activity:

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No public funding has been used or will be used in the development or the implementation of this project.

A.4.5. Confirmation that the small-scale project activity is not a debundled component of a large scale project activity:

This project is not a debundled component of a large project activity. This is the first brick factory fuel switch to charcoal in South Africa. This is the first CDM project by Allbrick. Evaluation of this project against the debundling criteria is contained in the table below:

A proposed small-scale project activity shall be deemed to be a debundled component of a large project activity if there is a registered small-scale CDM project activity or an application to register another small-scale CDM project activity:	**The Allbrick Fuel Switch**
(a) With the same project participants	This is the first CDM project in which Allbrick is the project participant.
(b) In the same project category and technology/measure; and	This is the first Allbrick project that switches from coal to charcoal.
(c) Registered within the previous 2 years, and	No small-scale CDM project activity with the same technology has been registered within the previous two years of the expected start date of this project.
(d) Whose project boundary is within 1 km of the project boundary of the proposed small-scale activity at the closest point?	The project at Allbrick will be the first CDM project in the area. There are no other CDM projects within 1km of this project.

The text in italics is from the *Compendium of guidance on the debundling for SSC project activities* (Annex 27, EB 36).

SECTION B. Application of a baseline and monitoring methodology

B.1. Title and reference of the approved baseline and monitoring methodology applied to the small-scale project activity:

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The Allbrick fuel switch project will use the following approved small scale CDM methodology (AMS):

AMS III. Z. – *'Fuel Switch, process improvement and energy efficiency in brick manufacture'*
Version 3

The methodology references the following documents:

1. *'General guidance on leakage in biomass project activities'* (Version 3)

   This guidance was used to determine if leakage in the project was potentially significant. The biomass used in the project is waste sourced from the local sawmills. It is not diverted from any competing uses and therefore there are no leakage emissions from competing uses for the biomass.

2. *'Tool to calculate baseline, project and/or leakage emissions from electricity consumption'* (Version 1)

The project emissions from the electricity consumption of the motors on the fans of the charcoal retorts were calculated in accordance with this tool. The *'Tool to calculate the emission factor for an electricity system'* was used to calculate the emission factor for the national electricity grid.

3. *'Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion'* (Version 2)

   The amount of coal still used in the project activity will be monitored. The 'Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion' will be used to determine the GHG emissions associated with this coal.

The *'Tool for the demonstration and assessment of additionality*' (Version 05.2) was used to prove the additionality of the project.

The emission factor for the electricity generation (grid electricity) was calculated in accordance with the latest approved version of the '*Tool to calculate the emission factor for an electricity system'* (Version 02.2).

B.2 Justification of the choice of the project category:

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The project meets the applicability criteria of the methodology as evaluated below:

The methodology AMS III Z is applicable under the following conditions:	**Fuel Switch to Charcoal at Allbrick, South Africa**
The methodology comprises shift to an alternative brick production process or partial substitution of fossil fuels with renewable biomass (including solid biomass residues such as sawdust and food industry organic liquid residues) in existing brick production facilities. Fuel substitution and associated activities may also result in improved energy efficiency of existing facility; however project activities primarily aimed at emission reductions from energy efficiency measures shall apply AMS-II.D. Thus the methodology is applicable for the production of: (a) *Bricks that are the same in the project and baseline cases; or* (b) *Bricks that are different in the project case versus the baseline case due to a change(s) in raw materials, …*	This project involves a thermal fuel substitution from coal to charcoal at an existing brick factory, Allbrick. The charcoal is produced from renewable biomass from sawmill wood off-cuts sourced from the surrounding area. The project is aimed primarily at fuel switching. The bricks are the same in the project activity and baseline cases, as in option (a). The bricks are produced using the same raw materials and process. It is only the fuel that has changed.
The measures may replace, modify or retrofit systems in existing facilities or be installed in a new facility.	The project takes place at an existing brick manufacturer. The fuel switch entails the following process modifications: • The technique used in the packing of the

The methodology AMS III Z is applicable under the following conditions:	**Fuel Switch to Charcoal at Allbrick, South Africa**
	clamp kilns is altered based on the research and development work done at Allbrick. • Retorts are erected on site for the purpose of producing charcoal.
New facilities (Greenfield projects) and project activities involving capacity additions compared to the baseline scenario are only eligible if they comply with the related and relevant requirements in the General Guidance for SSC methodologies.	Allbrick has been producing bricks on this site since before 1992. It is therefore not a new facility and the project activity does not involve capacity additions. The capacity of the plant during peak building demand times is over 4 million bricks a month. This amount of bricks was produced in July 2007[5]. However, the production is very much market-related.
The requirements concerning demonstration of the remaining lifetime of the replaced equipment shall be met as described in the General Guidance for SSC methodologies. If the remaining lifetime of the affected systems increases due to the project activity, the crediting period shall be limited to the estimated remaining lifetime, i.e., the time when the affected systems would have been replaced in the absence of the project activity.	As per the General Guidance for SSC methodologies, the methodological tool “Tool to determine the remaining lifetime of equipment” was used. The following option was chesen in the tool: *Option (a): Use manufacturer’s information for the technical lifetime of equipment and compare to the date of first commissioning*. No equipment is replaced in the project activity. The remaining lifetime of the existing equipment will be unchanged by the implementation of the project. This is owing to the temporary nature of the clamp kilns. Clamp kilns are frequently rebuilt and therefore have no assigned lifetime that can be determined by the tool. The lifetime is infinite due to the nature of the technology.
In the case of existing facilities, this category is only applicable if it can be demonstrated, with historical data, that for at least three year prior to the project implementation, only fossil fuel (no renewable biomass) was used in the brick production systems, which are being modified or retrofitted.	Coal consumption records at the Allbrick facility are available for three years prior to project implementation. The records show that only coal and no biomass was used in the two systems modified by the project activity, ie. body fuel and clamp kiln firing systems.

[5] Coal used and monthly brick production was provided at validation.

The methodology AMS III Z is applicable under the following conditions:	Fuel Switch to Charcoal at Allbrick, South Africa
	Research and Development work done at Allbrick between February 2009 and August 2009.
In the case of project activities involving changes in raw materials (including additives), it shall be demonstrated that additive materials are abundant in the country/region according to the following procedures: *Step 1: Using relevant literature and/or interviews with experts, a list of raw materials to be utilized is prepared based on the historic and/or present consumption of such raw materials.* *Step 2: The current supply situation for each type of raw material to be utilized is assessed and their availability abundance is demonstrated using one of the approaches below:* • *Approach 1: Demonstrate that the raw materials to be utilized, in the region of the project activity, are not fully utilized. For this purpose, demonstrate that the quantity of material is at least 25% greater than the demand for such materials or the availability of alternative materials for at least one year prior to the project implementation.* • *Approach 2: Demonstrate that suppliers of raw materials to be utilized, in the region of the project activity, are not able to sell all of the subject raw materials. For this purpose, project participants shall demonstrate that a representative sample of suppliers of the raw materials to be utilized, in the region, had a surplus of material (e.g., at the end of the period during which the raw material is sold), which they could not sell and which is not utilized.*	It is demonstrated that the raw materials are abundant in the region with a stepwise approach. **Step 1** Interview with experts were conducted. The experts chosen were the sawmill operators in the surrounding area. **Step 2** Approach 2 was chosen. It has been established that the suppliers of the raw materials in the area are not able to sell all of the subject materials. This is borne out by the fact that the material is given to Allbrick at no/low cost.
This methodology is applicable under the following conditions: (a) *The service level of project brick shall*	(a) The baseline and the project bricks both comply with SANS 227 Specification Standard.

The methodology AMS III Z is applicable under the following conditions:	**Fuel Switch to Charcoal at Allbrick, South Africa**
be comparable to or better than the baseline brick, i.e., the bricks produced in the brick production facility during the crediting period shall meet or exceed the performance level of the baseline bricks (e.g., dry compressive strength, wet compressive strength, density). An appropriate national standard shall be used to identify the strength class of the bricks, bricks that have compressive strengths lower than the lowest class bricks in the standard are not eligible under this methodology. Project bricks are tested in nationally approved laboratories at 6 months interval (at a minimum) and test certificates on compressive strength are made available for verification; (b) *The existing facilities involving modification and/or replacement shall not influence the production capacity beyond ±10% of the baseline capacity unless it is demonstrated that the baseline for the added capacity is the same as that for the existing capacity in accordance with paragraph 3;* (c) *Measures are limited to those that result in emission reductions of less than or equal to 60 kt CO_2 equivalent annually.*	Project bricks will be tested in an external laboratory every 6 months. (b) The project does not influence the production capacity of the facility. Clamp kilns are temporary structures erected with the bricks that are being fired. The production capacity of the plant during peak building demand times is over 4 million bricks a month. This amount of bricks was produced in July 2007[6]. However, the production is very much market-related. (c) The emission reductions claimed for this project will not exceed 60 kt CO_2 equivalent annually.
This methodology is not applicable if local regulations require the use of proposed technologies or raw materials for the manufacturing of bricks unless widespread non compliance (less than 50% of brick production activities comply in the country) of the local regulation evidenced.	There are no local regulations that require the use of specific technologies or raw materials for brick manufacture.

The project meets all the conditions set forth in the approved small-scale methodology AMS III Z. Hence, the selected methodology is appropriate for the project activity.

B.3. Description of the project boundary:

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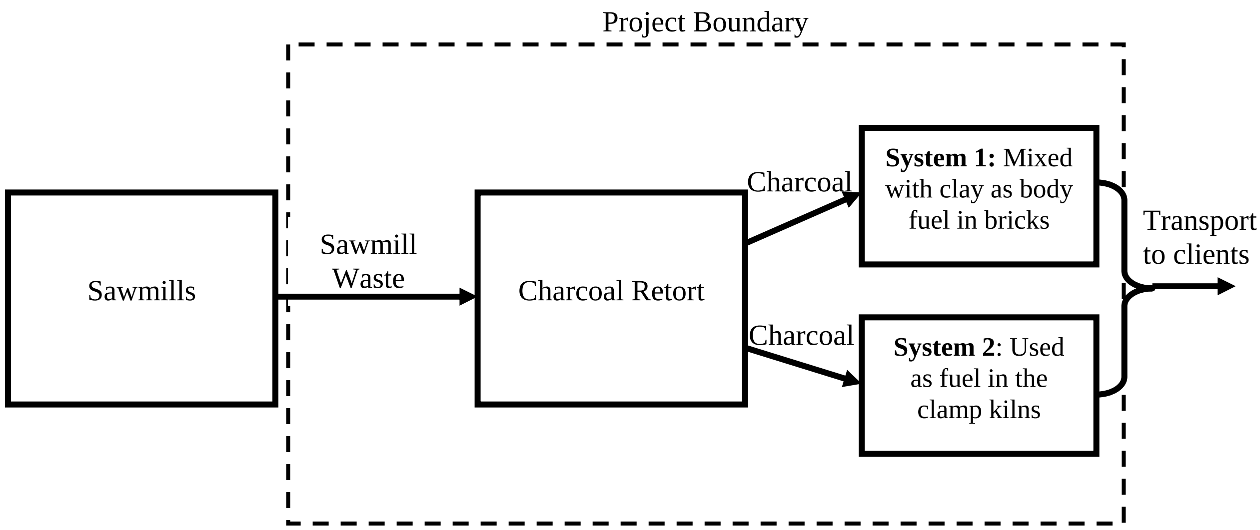
[6] Coal used and monthly brick production was provided at validation.

The project boundary encompasses the following:

- The brick manufacturing site (Allbrick Factory), including all clamp kilns and charcoal retorts; and
- The electricity grid for the purpose of calculating the grid emission factor.



B.4. Description of baseline and its development:

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The development of the baseline scenario has been done by the identification of plausible alternative scenarios to the project activity and barrier analysis on these alternatives.

Step 1: Identification of alternative scenarios

Sub-step 1a: Define alternative scenarios to the proposed CDM project activity

Alternative scenarios to the fuel switch project

1. Continuation of the use of coal as the thermal fuel in brick making at Allbrick.
2. Allbrick fuel switch project undertaken without registration as a CDM project.
3. A combination of coal and charcoal use in brick making at Allbrick.
4. The use of wood as thermal fuel in brick making at Allbrick

Sub-step 1b: Consistency with mandatory applicable laws and regulations

Scenario 1is consistent with mandatory applicable laws and regulations:

- In terms of sections 24 and 24D of the National Environmental Management Act no. 107 of 1998 a basic assessment is required for all activities listed in regulation 386 of 21 April 2006 and a full environmental impact assessment for all activities listed in regulation 387 of 21 April 2006. Clay brick manufacturing is not listed in either of these regulations.

- An Air Pollution Permit (Certificate number 1166/1) was issued to Allbrick in terms of the Air Pollution Prevention Act of 1965 on 17th August 1992. The Air Pollution Prevention Act was replaced in 2004 by the National Environmental Management: Air Quality Act (Act no. 39 of 2004, NEMAQA). NEMAQA does not make any provision for the licensing for either brick production or the manufacture of charcoal.

The same is applicable for scenarios 2 -4.

Step 2: Barrier analysis

<u>Sub-step 2a: Indentify barriers that would prevent the implementation of alternative scenarios</u>

1. *Continuation of the use of coal as the thermal fuel in brick making at Allbrick*

There are no barriers to this scenario. This is normal operation or business-as-usual at Allbrick.

2. *Allbrick fuel switch project undertaken without registration as a CDM project*

There are three significant barriers to the implementation of this project:

- There is no technological reference case for the production of high quality clay bricks using renewable biomass in South Africa. In order to overcome this barrier the following had to be done.
    - Initial tests in February 2009 indicated that the state of the art methods of packing a clamp kiln cannot yield bricks of sufficient quality if the coal is replaced with biomass.
    - A significant research and development program had to be constructed to modify the existing production methods in order to produce high quality bricks using biomass.
    - The nature of clay brick making technology in clamp kilns does not allow for small scale tests. Industrial large scale tests had to be performed in order to prove the performance of the clamp kilns with biomass. This represents a high cost in the areas of raw material supply, labour, equipment time, factory production capacity and off specification product.
- There is a significant market resistance to bricks fired with renewable fuels.
    - The initial response from the market was not favourable.
    - When it became known that Allbrick was considering a fuel switch the opportunity was seized by the competitors in the market to inflict reputational damage.
    - The only way to overcome this barrier would be to convince the market that the greenhouse gas emission reduction offers significant justification for the change in manufacturing procedure.
- A fuel switch of this nature carries a significant risk of technical failure that can have negative effects on the financial performance of Allbrick.

- Technical failure of a single clamp kiln will result in around 40% loss of revenue in that month.
- The total loss of technical failure of a single clamp kiln will consist of the loss of clients to alternative suppliers in a competitive market that will result in longer term loss of revenue.

3. *A combination of coal and charcoal use in brick making at Allbrick*

There are four significant barriers to the implementation of this project:

- There is no technological reference case for the production of high quality clay bricks using renewable biomass in South Africa. In order to overcome this barrier the following had to be done.
    - Initial tests in February 2009 indicated that the state of the art methods of packing a clamp kiln cannot yield bricks of sufficient quality if the coal is replaced with biomass.
    - A significant research and development program (although smaller than that required for a full fuel switch) had to be constructed to modify the existing production methods in order to produce high quality bricks using biomass.
    - The nature of clay brick making technology in clamp kilns does not allow for small scale tests. Industrial large scale tests had to be performed in order to prove the performance of the clamp kilns with biomass. This represents a high cost in the areas of raw material supply, labour, equipment time, factory production capacity and off specification product.
- There is a significant market resistance to bricks fired with renewable fuels[7].
    - The initial response from the market was not favourable.
    - When it became known that Allbrick was considering a fuel switch the opportunity was seized by the competitors in the market to inflict reputational damage.
    - The only way to overcome this barrier would be to convince the market that the greenhouse gas emission reduction offers significant justification for the change in manufacturing procedure.
- A fuel switch of this nature carries a significant risk of technical failure that can have negative effects on the financial performance of Allbrick.
    - Technical failure of a single clamp kiln will result in around 40% loss of revenue in that month.
    - The total loss of technical failure of a single clamp kiln will consist of the loss of clients to alternative suppliers in a competitive market that will result in longer term loss of revenue.
- Two systems for the coal and charcoal will have to be run simultaneously. This is in opposition to a scenario where just a coal or a charcoal system is followed. The disadvantages of two

[7] Reference documentation was made available at validation. The documentation unfortunately cannot be made publically available as it is commercially sensitive

parallel systems include separate storage areas, increased deliveries, increased administration and other tasks that would need to be done twice.

4. *The use of wood as thermal fuel in brick making at Allbrick*

This option was judged to be technically infeasible for a number of technical reasons relating to the quality of the fuel (consistency, moisture content, fixed carbon content and combustion rates), and its interaction with the complex system of clay firing. It is the expert opinion of Allbrick's technologists that the challenges in using wood as thermal fuel will be insurmountable.

Therefore, continuation of coal use as the thermal fuel in brick making at Allbrick is the only scenario that is not prevented by identified barriers. Hence, this is the baseline for the project activity.

B.5. Description of how the anthropogenic emissions of GHG by sources are reduced below those that would have occurred in the absence of the registered small-scale CDM project activity:

Prior Consideration

Prior consideration was lodged with the UNFCCC on the 14 August 2009. The start date of the project activity is the purchase of the material to manufacture the retort to supply charcoal for brick manufacturing; which was in March 2009. This is within 6 months in accordance with EB 49 Annex 22. The timeline and documentation of the Allbrick fuel switch project is described in more detail in the table below:

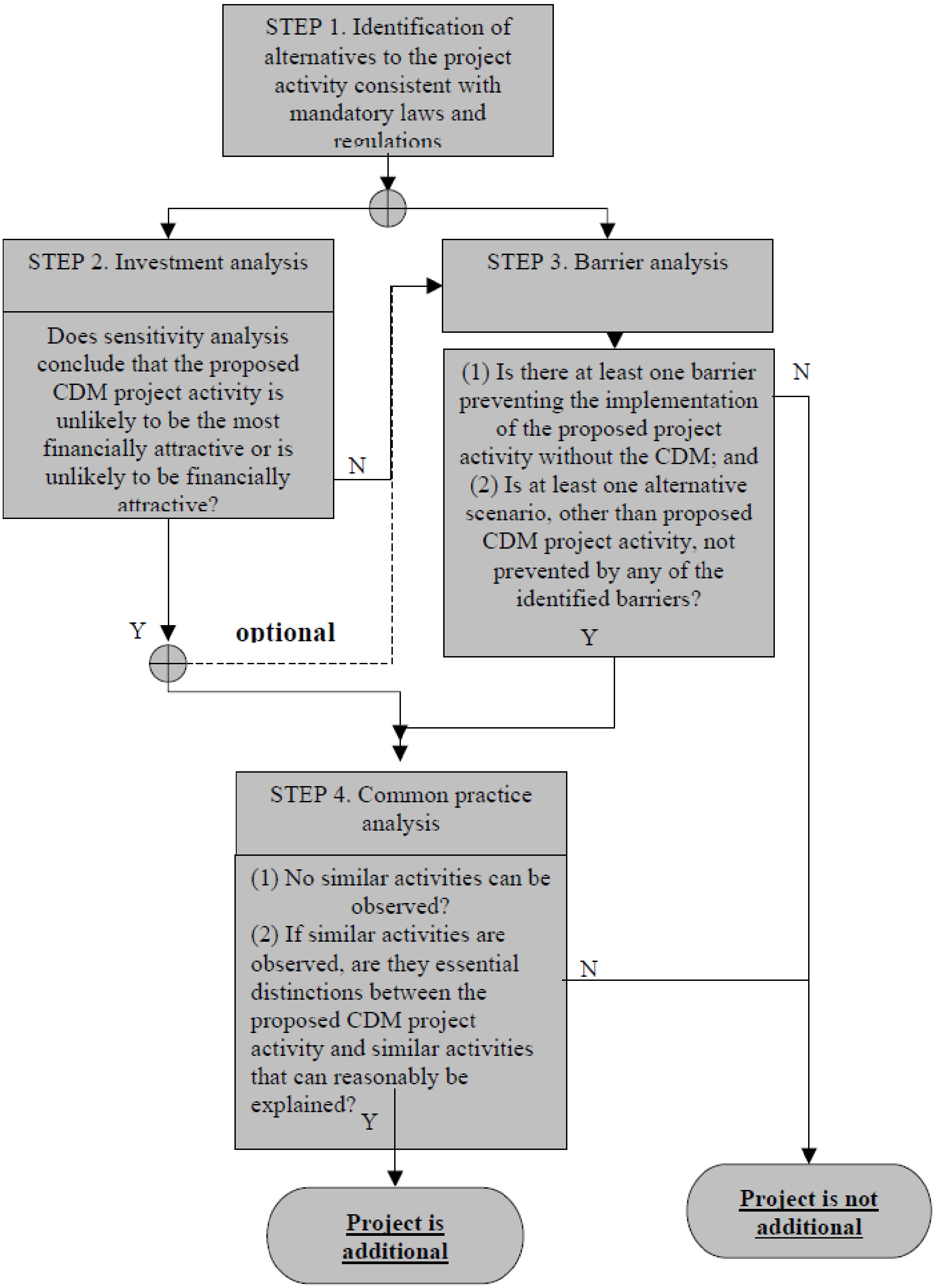
Date	Milestone
October 2008	Allbrick phoned the South African DNA to discuss possible carbon projects at the factory. They were referred by the DNA to the Central Energy Fund (CEF).
October 2008	CEF expressed interest in the charcoal production, factory fuel switch, biochar and possible generation of electricity with offgas from charcoal production. There has been no subsequent CEF activity or involvement in this project from this point onwards.
February 2009	Test work on producing bricks with charcoal started[8]. Charcoal used in the tests was produced in the existing retorts servicing the charcoal market. The first bricks produced in this test did not meet the SANS 227 specification; leading to the research and development program.
March 2009	Once these initial tests were successful, an order for the material to build a charcoal retort to service the brick manufacturing plant was placed. This is the first significant capital outlay for this fuel switch project and therefore signifies the project start date. The decision was taken by Andre Taljaard and Gavin Jooste joint CEOs of Allbrick Manufacturing and Marketing (Pty) Ltd. The project start date is marked by the placing of the order for the charcoal retort on "Steel and Pipes for Africa" on 11 March 2009.
April to May 2009	Built charcoal retort to supply charcoal for eco-friendly brick production.
June 2009	The first time the full fuel switch at Allbrick was successful indicating the successful completion of the research and development program initiated in February 2009.

[8] Coal was not used in April and May at Allbrick. This can be seen from the coal use record at Allbrick, provided at validation.

July 2009	Charcoal supply contract with Cadac
August 2009	Notification of CDM prior intent lodged with the UNFCCC.
November 2009	Local public participation process
February 2010	Validation onsite visit and GSP process start

Additionality

The approach used to demonstrate the additionality of the project is in the diagram below:



Step 1: Identification of alternatives to the project activity consistent with current laws and regulations

Sub-step 1a: Define alternatives project activity

Alternative scenarios to the fuel switch project

1. Continuation of the use of coal as the thermal fuel in brick making at Allbrick.
2. A combination of coal and charcoal use in brick making at Allbrick.
3. Allbrick fuel switch project undertaken without registration as a CDM project.
4. The use of wood as thermal fuel in brick making at Allbrick

Sub-step 1b: Consistency with mandatory laws and regulations

All of the above alternative scenarios are consistent with applicable laws and regulations.

In terms of sections 24 and 24D of the National Environmental Management Act no. 107 of 1998 a basic assessment is required for all activities listed in regulation 386 of 21 April 2006 and a full environmental impact assessment for all activities listed in regulation 387 of 21 April 2006. Clay brick manufacturing is not listed in either of these regulations.

An Air Pollution Permit (Certificate number 1166/1) was issued to Allbrick in terms of the Air Pollution Prevention Act of 1965 on 17th August 1992. The Air Pollution Prevention Act was replaced in 2004 by the National Environmental Management: Air Quality Act (Act no. 39 of 2004, NEMAQA). NEMAQA does not make any provision for the licensing for either brick production or the manufacture of charcoal.

Step 2: Investment analysis

The additionality of this project is determined based on a barrier analysis conducted below.

Step 3: Barrier analysis

Sub-step 3a: Indentify barriers that would prevent the implementation of the proposed CDM project activity

Technological barriers

- There is no technological reference case for the production of high quality clay bricks using renewable biomass or combinations thereof with fossil fuels in South Africa. In order to overcome this barrier the following had to be done.
    - A significant research and development program had to be constructed to modify the existing production methods in order to produce high quality bricks using biomass.
    - The nature of clay brick making technology in clamp kilns does not allow for small scale tests. Industrial large scale tests had to be performed in order to prove the performance of the clamp kilns with biomass. This represents a high cost in the areas of raw material supply, labour, equipment time, factory production capacity and off specification product.
- Allbrick had to redesign the current market retort for use in their facility. The construction of the Allbrick retort is more costly than purchasing a retort from a supplier and the use of this new technology introduces technological risks to the project. The technology is not proven technology. Financiers are reluctant to invest in a project where the technology has not been

proven. The carbon credit revenue makes this project more attractive to financiers; helping to overcome the risks associated with using a new technology.

- The Allbrick factory workers needed to be trained on the operation of charcoal retorts. Previously the workers had only participated in the brick production with coal. The factory workers had to learn to build the modified clamp kilns and operate the charcoal retorts.

Prevailing practice barriers
This project is the first of its kind in South Africa. This is confirmed by the letter from the Clay Brick Association of South Africa in Annex 5.

Market Barriers
One of the most significant barriers to the project is the perception in the brick market about the quality of bricks produced using charcoal. The charcoal-fired bricks are perceived to be of lesser quality than the fossil fuel alternatives.

Allegations were made about the quality of the Allbrick 'green' bricks very soon after the introduction of the bricks into the market on a trial basis (April 2009). The following allegation about the bricks was made in the market by a competitor:

> *'These poor quality product issues stem from what we understand to be from them no longer firing their product with fossil fuel, alternatively they have opted for a cheaper "pine charcoal" fuel base.'* (see Annex 5 for reference document, "Email and Lawyer's response in connection with brick quality")

These allegations are false as the Allbrick bricks exceed the South African National Standard 227. However, the allegations led to the need for Allbrick to consult an attorney. An excerpt from Allbrick's attorney in response to some of the allegations is presented below:

> *'The allegations pertaining to our client's poor quality of bricks made from a different fuel base are malicious, as the bricks manufactured from our fuel base fully comply with and exceed the SANS 227 Standard.'* (see Annex 5 for reference document, "Email and Lawyer's response in connection with brick quality")

The perception in the market about these charcoal-fired bricks, however untrue it is, poses a significant barrier to the success of the project. Allbrick had to make a significant investment in marketing effort in order to overcome this considerable barrier.

Sub-step 3b: Show that the identified barriers would not prevent the implementation of at least one of the alternatives (except the proposed project activity):
The identified barriers are sufficient to prevent the implementation of scenarios 2 to 4. No barriers to prevent the continuation of the current practice at Allbrick, which is the baseline scenario, have been identified.

Step 4: Common practice analysis

The project is the first of its kind in the whole of South Africa. This is confirmed by the letter from the Clay Brick Association of South Africa[9].

Registering the fuel switch project as a CDM project, is feasible for the following reasons

- The positive image of the project as a greenhouse gas mitigation project is required to redress the market perception of charcoal fired bricks
- The revenue from carbon credits will balance the risk of technological failure and the potential impact thereof on the finances of Allbrick.

Therefore the Allbrick fuel switch project is additional.

B.6. Emission reductions:

B.6.1. Explanation of methodological choices:

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The emission reductions of the project were calculated using:

- AMS III. Z. – *'Fuel Switch, process improvement and energy efficiency in brick manufacture.'*
- *'Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion.'*
- *'Tool to calculate baseline, project and/or leakage emissions from electricity consumption.'*
- *'Tool to calculate the emission factor for an electricity system.'*

<u>Baseline emissions:</u>

The baseline emissions in the Allbrick Fuel Switch are a result of the production *of bricks using coal. The baseline emissions were calculated using three years historical coal consumption and brick production valu*es. Equations (1), (2) and (3) are from AMS III. Z.

$$BE_y = EF_{BL} * P_{PJ,y} \quad (1)$$

Where:

BE_y The annual baseline emissions from fossil fuels displaced by the project activity in t CO_2e in year y (of the crediting period)

EF_{BL} The annual production specific emission factor for year y, in t CO_2/kg or m^3

$P_{PJ,y}$ The annual net production of the facility in year y, in kg or m^3

$$EF_{BL} = \sum_{j,i}(FC_{BL,i,j} * NCV_j * EF_{CO_2,j})/P_{Hy} \quad (2)$$

Where:

$FC_{BL,i,j}$ Average annual baseline fossil fuel consumption value for fuel type *j* combusted in the process *i*, using volume or weight units

NCV_j Average net calorific value of fuel type *j* combusted, TJ per unit volume or mass unit

$EF_{CO2,j}$ CO_2 emission factor of fuel type *j* combusted in the process *i* in t CO_2/TJ

P_{Hy} Average annual historical baseline brick production rate in units of weight or volume, kg or m^3

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[9] A copy of the letter can be found in Annex 5.

Project emissions:

The project emissions are a result of electricity consumption on the motors of the water pumps on the charcoal retorts and LPG and coal consumption. It is unlikely that coal will be used again at Allbrick. However an equation is included to allow the emissions from any possible coal use at Allbrick in the future to be accounted for. Zero tons coal was used in the ex ante calculations in section B.6.3.

$$PE_y = PE_{FC,j,y} + PE_{EC,y} \quad (3)$$

Where:

PE_y	Project emissions in year y (tCO_2/yr)
$PE_{FC,j,y}$	Are the CO_2 emissions from fossil fuel combustion in process *j* during the year *y* (tCO_2/yr)
$PE_{EC,y}$	Project emissions from electricity consumption in year y (tCO_2/yr)

Equations (4) and (5) are from the *Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion.*

$$PE_{FC,j,y} = \sum_i FC_{i,j,y} * COEF_{i,y} \quad (4)$$

Where:

$PE_{FC,j,y}$	Are the CO_2 emissions from fossil fuel combustion in process *j* during the year *y* (tCO_2/yr)
$FC_{i,j,y}$	Is the quantity of fuel type *i* combusted in the process *j* during the year *y* (mass or volume units/year)
$COEF_{i,y}$	Is the CO_2 emission coefficient for fuel type *i* in year *y* (tCO_2/mass or volume unit)
i	Are the fuel types combusted in process *j* during the year *y*

$$COEF_{i,y} = NCV_{i,y} * EF_{CO2,i,y} \quad (5)$$

Where:

$COEF_{i,y}$	Is the CO_2 emission coefficient for fuel type *i* in year *y* (tCO_2/mass or volume unit)
$NCV_{i,y}$	Is the weighted average net calorific value of the fuel type *i* in year *y* (GJ/mass or volume unit)
$EF_{CO2,i,y}$	Is the weighted average CO_2 emission factor of fuel type *i* in year *y* (tCO_2/GJ)
i	Are the fuel types combusted in process *j* during the year *y*

Equation (6) is from the *Tool to calculate baseline, project and/or leakage emissions from electricity consumption.*

$$PE_{EC,y} = \sum_j EC_{PJ,j,y} * EF_{EL,j,y} * (1 + TDL_{j,y}) \quad (6)$$

Where:

$PE_{EC,y}$	Project emissions from electricity consumption in year y (tCO_2/yr)
j	Sources of electricity consumption in the project
$EC_{PJ,j,y}$	Quantity of electricity consumed by the project electricity consumption source *j* in year y (MWh/yr)
$EF_{EL,j,y}$	Emission factor for electricity generation for source *j* in year y (tCO_2/MWh)

$TDL_{j,y}$ Average technical transmission and distribution losses for providing electricity to source *j* in year y

The project activity will displace grid electricity.

The emission factor for the grid electricity was calculated in accordance with the latest approved version of the "Tool for calculation of emission factor for electricity systems," Version 02.2. The steps applied to determine the emission factor for the grid were as follows:

Step 1: Identify the relevant electric power system
The project electricity system includes the power plants that are physically connected through transmission and distribution lines to the project activity and that can be displaced without significant transmission constraints. South Africa is the host country for the project activity and the national boundary of the country is also the grid boundary. The project activity sources electricity from the South African national electricity grid. Imports have been considered as per definition of the tool.

Step 2: Chose whether to include off-grid power plants in the project electricity system (optional)
The grid emission factor is calculated from only grid power plants (Option I). Off-grid power plants are not included in the calculations.

Step 3: Select an operating margin method
The OM is calculated using the simple OM method (Option (a)). The simple OM method can be used provided that the low-cost/must-run resources constitute less than 50% of the total grid generation in average of the five most recent years.

If adding the Eskom and non-Eskom low-cost/must-run resources, the total percentage amount to 6.16% of the total grid generation in average of the five most recent years. Therefore, Option (a) is applicable to the situation in South Africa.

In terms of data vintages, the *ex ante* option were chosen to calculate the simple OM. In this option a 3 year generation-weighted average are used for the grid power plants. Using this option also means that the emission factor is determined only once at the validation stage, thus no monitoring and recalculation is required during the crediting period.

The data used in OM calculations are for the 3 year period of 1 April 2005 – 31 March 2008 (Eskom financial year is from 1 April – 31 March).

Step 4: Calculation of the operating margin emission factor
Option B is used for calculating the simple OM. The calculations in this option are based on the total net electricity generation of all power plants serving the system and the fuel types and fuel consumption of the project electricity system. Option B is used seeing that:

a) The necessary data for Option A (electricity generation and emission factor for each power unit) is not available; and
b) Only nuclear and renewable power generation are considered as low-cost/must-run power sources and the quantity of electricity supplied to the grid by these sources is know; and

Off-grid power plants are not included in the calculation.

Equation 7 (in the methodological tool) is used to calculate the simple OM:

$$EF_{grid,OMsimple,y} = \frac{\sum_i \left(FC_{i,y} \times NCV_{i,y} \times EF_{CO2,i,y}\right)}{EG_y}$$ **(GEF Tool[10] Eq. 7)**

Where:

$EF_{grid, OMsimple,y}$	=	CO_2 emission factor of power unit *m* in year *y* (tCO_2/MWh)
$FC_{i,y}$	=	Amount of fossil fuel type i consumed by power plant/unit m in year y (mass or volume unit)
$NCV_{i,y}$	=	Net calorific value (energy content) fossil fuel type i in year y (GJ/mass or volume)
$EF_{CO2,i,y}$	=	CO_2 emission factor of fossil fuel type i in year y (tCO_2/GJ)
EG_y	=	Net electricity generated and delivered to the grid by all power sources serving the system, not including low-cost/must-run power plants/units, in year y (MWh)
i	=	All fossil fuel types combusted in power sources in the project electricity system in year y
y	=	The relevant year as per data vintage chosen in Step 3.

Step 5: Identify the cohort of power units to be included in the build margin
The sample of power units *m* used to calculate the build margin consists of either:

(a) The set of five power units that have been built most recently, or
(b) The set of power capacity additions in the electricity system that comprise 20% of the system generation (in MWh) and have been built most recently.

The set of power plants that comprise the larger annual generation should be used.

Option (b) is not viable seeing that non-Eskom data is not available for any vintage after 2006. All the commissioning dates of the power plants are available; therefore Option (a) is used.

In order to determine the vintage of data, one of the following options must be selected:

Option 1: For the first crediting period, calculate the build margin emission factor *ex ante* based on the most recent information available at the time of CDM-PDD submission to the DOE for validation.
Option 2: For the first crediting period, the build margin emission factor shall be updated annually, *ex post*, including those units built up to the year of registration of the project activity.

[10] UNFCCC methodological tool for the grid emission factor (GEF), "Tool for calculation of emission factor for electricity systems," Version 02.

Option 1 is used for this project due to the lack consistent data from the same vintage for the Eskom and non-Eskom power plants.

Step 6: Calculate the build margin emission factor

The build margin emissions factor is the generation-weighted average emission factor (tCO_2/MWh) of all power units *m* during the most recent year *y* for which power generation data is available, calculated as follows:

$$EF_{grid,BM,y} = \frac{\sum_m EG_{m,y} \cdot EF_{EL,m,y}}{\sum_m EG_{m,y}}$$ **(GEF Tool Eq. 13)**

Where:

$EF_{grid,BM,y}$	Build margin CO_2 emission factor in year y (tCO_2/MWh)
$EG_{m,y}$	Net quantity of electricity generated and delivered to the grid by power unit *m* in year *y* (MWh)
$EF_{EL,m,y}$	CO_2 emission factor of power unit *m* in year *y* (tCO_2/GJ)
M	Power units included in the build margin
y	The relevant year as per data vintage chosen in Step 3.

The CO_2 emission factor of each power unit m ($EL_{EL,m,y}$) should be determined as per the guidance in step 3(a) for the simple OM, using option A1 using for y the most recent historical year for which power generation data is available, and using for m the power units included in the build margin.

If for a power unit *m* data on fuel consumption and electricity generation is available the emission factor ($FE_{EL,m,y}$) should be determined as follows:

$$EF_{EL,m,y} = \frac{\sum_i FC_{i,m,y} \cdot NCV_{i,y} \cdot EF_{CO2,i,y}}{\sum_m EG_{m,y}}$$ **(GEF Tool Eq. 2)**

Where:

$EF_{EL,m,y}$	CO_2 emission factor of power unit *m* in year *y* (tCO_2/MWh)
$FC_{i,m,y}$	Amount of fossil fuel type *i* consumed by power unit *m* in year *y* (mass or volume unit)
$NCV_{i,y}$	Net calorific value (energy content) fossil fuel type *i* in year y (GJ/mass or volume)
$EF_{CO2,i,y}$	CO_2 emission factor of fossil fuel type *i* in year y (tCO_2/GJ)
$EG_{m,y}$	Net electricity generated and delivered to the grid by power unit *m* in year *y* (MWh)
m	All power plants/units serving the grid in year y except low-cost/must-run power plants/units
i	All fossil fuel types combusted in power plant/unit m in year y

y The relevant year as per data vintage chosen in Step 3.

Step 7: Calculate the combined margin emission factor
The combined margin factor is calculated as follows:

$$EF_{grid,CM,y} = EF_{grid,OM,y} \times w_{OM} + EF_{grid,BM,y} \times w_{BM}$$ **(GEF Tool Eq. 14)**

Where:

$EF_{grid,BM,y}$ Build Margin CO_2 emission factor in year y (tCO_2/MWh)

$EF_{grid,OM,y}$ Operating margin CO_2 emission factor in year y (tCO_2/MWh)

w_{OM} Weighting of operating margin emissions factor (%)

w_{BM} Weighting of build margin emissions factor (%)

Please see the document entitled '*Calculation of the Emission Factor for the South African Grid*' for a detailed calculation of the grid emission factor.

<u>Leakage emissions:</u>

Leakage occurs under this methodology from diversion of biomass from competing uses and the emissions associated with the production/consumption and transport of the raw/additive materials consumed as compared to the baseline. The biomass used in the project is renewable waste biomass, as per Annex 18, EB 23, from plantations in the surrounding area. There are no competing uses as there is a surplus of biomass in the region, as established at validation.

The transport of the sawmill waste and any possible coal used is included in equation 7 below.

$$LE_{y,transp} = \sum_{i=1}^{n} \left(\frac{Q_{i,y}}{CT_{i,y}} \right) \times DAF_{i,w} \times EF_{CO2} \quad (7)$$

Where:

$LE_{y,,transp}$ Emissions through incremental transportation in the year *y* (tCO_2e)
i Project waste or feed materials source
$Q_{i,y,}$ Quantity of material *i* combusted, gasified or mechanically/thermally treated in the year *y* (tonnes)
$CT_{i,y}$ Average truck capacity for material *i* transportation (tonnes/truck)
$DAF_{i,w}$ Average incremental distance for material *i* transportation (km/truck)
EF_{CO2} CO_2 emission factor from fuel use due to transportation (tCO_2/km, IPCC default values or local values)

The transport of the sawmill waste and any possible coal used is however excluded as per the *General guidance on leakage in biomass project activities* which defines potentially significant leakage emissions as those greater than 10% of project emission reductions. The project leakage emissions calculated *ex ante* were less than 1% of the project emission reductions. Therefore leakage emissions have been excluded as they are insignificant in accordance with the guidance. .

Emission reductions:

The overall emission reductions of the project are calculated using equation 7.

$$ER_y = BE_y - PE_y - LE_y \quad (7)$$

Where:

ER_y	Emission reductions in year y (tCO_2e/yr)
BE_y	Baseline emissions in year y (tCO_2e/yr)
PE_y	Project emissions in year y (tCO_2/yr)
LE_y	Leakage emissions in year y (tCO_2/yr)

B.6.2. Data and parameters that are available at validation:

Data / Parameter:	$FC_{BL,prod,coal}$
Data unit:	tons
Description:	Average annual baseline coal consumption in body coal and clamp kilns
Source of data used:	Allbrick records
Value applied:	6,562
Justification of the choice of data or description of measurement methods and procedures actually applied :	Three years data was averaged to get this annual baseline coal consumption. The data range was April 2006 to March 2009.
Any comment:	No further comment

Data / Parameter:	NCV_{coal}
Data unit:	TJ/ton
Description:	Average net calorific value of coal combusted
Source of data used:	2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 2, Chapter 1, pg 18, *Other bituminous coal (default value)*
Value applied:	0.0258
Justification of the choice of data or description of measurement methods and procedures actually applied :	Other bituminous coal was selected as it has similar properties to the coal consumed on site.
Any comment:	No further comment

Data / Parameter:	$EF_{CO2,coal}$
Data unit:	$t\ CO_2/TJ$
Description:	CO_2 emission factor of coal combusted
Source of data used:	2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 2, Chapter 2, pg 16, *Other bituminous coal (default value)*

Value applied:	94.2
Justification of the choice of data or description of measurement methods and procedures actually applied :	Other bituminous coal was selected as it has similar properties to the coal consumed on site.
Any comment:	No further comment

Data / Parameter:	P_{Hy}
Data unit:	kg
Description:	Average annual historical baseline brick production
Source of data used:	Allbrick production records
Value applied:	72,864,316
Justification of the choice of data or description of measurement methods and procedures actually applied :	An annual average over three years (April 2006 to March 2009) baseline data was used. The peak of the data was a monthly brick production value of over 4 million bricks (roughly 12.5 million kg) extruded.
Any comment:	The annual average production in the project case is expected to be less for the first number of years on the crediting period due to the slow recovery of the building industry in South Africa following the global crisis of 2008 and 2009.

Data / Parameter:	$EF_{EL,grid,y}$
Data unit:	tCO_2/MWh
Description:	Emission factor for electricity from the national grid
Source of data to be used:	The emission factor for the South African grid is calculated in accordance with the *'Tool to calculate the emission factor of an electrical system (Version 2.2)'*
Value of data	1.02
Description of measurement methods and procedures to be applied:	As per the tool.
QA/QC procedures to be applied:	N/A
Any comment:	The grid emission factor will be fixed for the duration of the crediting period on an ex ante basis as allowed by the tool.

B.6.3 Ex-ante calculation of emission reductions:

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Baseline emissions:

Equation 1

$$BE_y = EF_{BL} * P_{PJ,y}$$

Year	BE_y	EF_{BL}	$P_{PJ,y}$

Unit	$t\ CO_2/yr$	$t\ CO_2/kg$	kg/yr
1	6 035	0.000220	27 458 331
2	6 035	0.000220	27 458 331
3	6 035	0.000220	27 458 331
4	6 035	0.000220	27 458 331
5	6 035	0.000220	27 458 331
6	6 035	0.000220	27 458 331
7	6 035	0.000220	27 458 331
8	6 035	0.000220	27 458 331
9	6 035	0.000220	27 458 331
10	6 035	0.000220	27 458 331

Equation 2

$$EF_{BL} = \sum_{j,i} \left(FC_{BL,i,j} * NCV_j * EF_{CO_2,j} \right) / P_{Hy}$$

Year	EF_{BL}	FC_{BL}	**NCV**	EF_{CO2}	P_{Hy}
Unit	$t\ CO_2/kg$	t	TJ/t	$t\ CO_2/TJ$	kg
1	0.000220	6 562	0.0258	94.6	72 864 316
2	0.000220	6 562	0.0258	94.6	72 864 316
3	0.000220	6 562	0.0258	94.6	72 864 316
4	0.000220	6 562	0.0258	94.6	72 864 316
5	0.000220	6 562	0.0258	94.6	72 864 316
6	0.000220	6 562	0.0258	94.6	72 864 316
7	0.000220	6 562	0.0258	94.6	72 864 316
8	0.000220	6 562	0.0258	94.6	72 864 316
9	0.000220	6 562	0.0258	94.6	72 864 316
10	0.000220	6 562	0.0258	94.6	72 864 316

Project Emissions:

Equation 3

$$PE_y = PE_{FC,j,y} + PE_{EC,y}$$

Year	PE_y	$PE_{FC,j,y}$	$PE_{EC,y}$
Unit	$t\ CO_2/yr$	$t\ CO_2/yr$	$t\ CO_2/yr$
1	431	2	429
2	431	2	429
3	431	2	429

4	431	2	429
5	431	2	429
6	431	2	429
7	431	2	429
8	431	2	429
9	431	2	429
10	431	2	429

Equation 4

$$PE_{FC,j,y} = \sum_{i} FC_{i,j,y} * COEF_{i,y}$$

Year	**$PE_{FC,j,y}$**	**$FC_{coal,j,y}$**	**$COEF_{coal,y}$**	**$FC_{LPG,j,y}$**	**$COEF_{LPG,y}$**
Unit	t CO_2/yr	t/yr	t CO_2/t	t/yr	t CO_2/t
1	1.70	-	2.44	0.57	2.98
2	1.70	-	2.44	0.57	2.98
3	1.70	-	2.44	0.57	2.98
4	1.70	-	2.44	0.57	2.98
5	1.70	-	2.44	0.57	2.98
6	1.70	-	2.44	0.57	2.98
7	1.70	-	2.44	0.57	2.98
8	1.70	-	2.44	0.57	2.98
9	1.70	-	2.44	0.57	2.98
10	1.70	-	2.44	0.57	2.98

Equation 5

$$COEF_{i,y} = NCV_{i,y} * EF_{CO2,i,y}$$

Year	**$COEF_{LPG,y}$**	**$NCV_{LPG,y}$**	**$EF_{CO2,LPG,y}$**
Unit	t CO_2/t	GJ/t	t CO_2/GJ
1	2.98	47.30	0.0631
2	2.98	47.30	0.0631
3	2.98	47.30	0.0631
4	2.98	47.30	0.0631
5	2.98	47.30	0.0631
6	2.98	47.30	0.0631
7	2.98	47.30	0.0631
8	2.98	47.30	0.0631
9	2.98	47.30	0.0631

10	2.98	47.30	0.0631

Equation 6

$$PE_{EC,y} = \sum_j EC_{PJ,j,y} * EF_{EL,j,y} * (1 + TDL_{j,y})$$

Year	**$PE_{EC,y}$**	**$EC_{PJ,j,y}$**	**$EF_{EL,j,y}$**	**$TDL_{j,y}$**	**$(1+TDL_{j,y})$**
Unit	t CO_2/yr	MWh/yr	t CO_2/MWh	**%**	**%**
1	429	394.20	1.02	0.067	1.067
2	429	394.20	1.02	0.067	1.067
3	429	394.20	1.02	0.067	1.067
4	429	394.20	1.02	0.067	1.067
5	429	394.20	1.02	0.067	1.067
6	429	394.20	1.02	0.067	1.067
7	429	394.20	1.02	0.067	1.067
8	429	394.20	1.02	0.067	1.067
9	429	394.20	1.02	0.067	1.067
10	429	394.20	1.02	0.067	1.067

<u>Leakage Emissions:</u>
Calculations shown for assessment purposes, but leakage emissions are excluded from emission reduction calculations as described in B.6.1.

Equation 7

$$LE_{y,transp} = \frac{Q_{c,y}}{CT_{c,y}} \times DA_{c,w} \times EF_{CO2} + \frac{Q_{w,y}}{CT_{w,y}} \times DAF_{w,w} \times EF_{CO2}$$

Year	**$LE_{y,trans}$**	**$Q_{c,y}$**	**$CT_{c,y}$**	**$DAF_{c,w}$**	**EF_{CO2}**	**$Q_{w,y}$**	**$CT_{w,y}$**	**$DAF_{w,w}$**	**EF_{CO2}**
1	30	66	32	1 040	0.00147	5 138	8.1	50	0.00085
2	30	66	32	1 040	0.00147	5 138	8.1	50	0.00085
3	340	6 562	32	1 040	0.00147	5 138	8.1	50	0.00085
4	340	6 562	32	1 040	0.00147	5 138	8.1	50	0.00085
5	340	6 562	32	1 040	0.00147	5 138	8.1	50	0.00085
6	340	6 562	32	1 040	0.00147	5 138	8.1	50	0.00085
7	340	6 562	32	1 040	0.00147	5 138	8.1	50	0.00085
8	340	6 562	32	1 040	0.00147	5 138	8.1	50	0.00085
9	340	6 562	32	1 040	0.00147	5 138	8.1	50	0.00085
10	340	6 562	32	1 040	0.00147	5 138	8.1	50	0.00085

Emission Reductions:

Equation 8

$$ER_y = BE_y - PE_y - LE_y$$

Year	ER_y	BE_y	PE_y	LE_y
	t CO_2/yr	t CO_2/yr	t CO_2/yr	t CO_2/yr
1	5 604	6 035	431	-
2	5 604	6 035	431	-
3	5 604	6 035	431	-
4	5 604	6 035	431	-
5	5 604	6 035	431	-
6	5 604	6 035	431	-
7	5 604	6 035	431	-
8	5 604	6 035	431	-
9	5 604	6 035	431	-
10	5 604	6 035	431	-

B.6.4 Summary of the ex-ante estimation of emission reductions:

>>

Year	**Estimation of project activity emissions (tonnes of CO_2 e)**	**Estimation of baseline emissions (tonnes of CO_2 e)**	**Estimation of leakage (tonnes of CO_2 e)**	**Estimation of overall emission reductions (tonnes of CO_2 e)**
1	431	6,035	0	5,604
2	431	6,035	0	5,604
3	431	6,035	0	5,604
4	431	6,035	0	5,604
5	431	6,035	0	5,604
6	431	6,035	0	5,604
7	431	6,035	0	5,604
8	431	6,035	0	5,604
9	431	6,035	0	5,604
10	431	6,035	0	5,604
Total (tonnes of CO_2 e)	4 306.24	60 350.23	**0**	56 043.99

B.7 Application of a monitoring methodology and description of the monitoring plan:

B.7.1 Data and parameters monitored:

Data / Parameter:	$P_{PJ,y}$
Data unit:	kg

Description:	The annual net production of the facility in year y
Source of data to be used:	Daily packing records consolidated in a monthly figure, as well as the average weight of bricks produced in that month.
Value of data	34,322,913
Description of measurement methods and procedures to be applied:	The number of bricks produced is measured daily and consolidated into a monthly figure. This is multiplied by the average weight of the brick. The weight of a brick will be measured by random sampling on a calibrated scale. One hundred bricks will be measured per month. The average of the weights obtained will be used in the calculation, taking into consideration the QA/QC procedures described below. The net production will be integrated annually.
QA/QC procedures to be applied:	If there are differences between the measured value of the bricks and the pre-project average weight of 2.88 kg, then it must be justified in the monitoring report.
Any comment:	

Data / Parameter:	$FC_{BL,prod,coal}$
Data unit:	tons/year
Description:	The quantity of coal combusted in the project activity during the year *y*
Source of data to be used:	Allbrick production records and any coal delivery receipts
Value of data	0
Description of measurement methods and procedures to be applied:	If any coal is used in the brick production process it will be measured on site on a monthly basis.
QA/QC procedures to be applied:	The coal used will be cross checked with the coal delivery notes and any on-site stockpile. If there are any significant differences then these differences must be justified in the monitoring report.
Any comment:	

Data / Parameter:	$NCV_{coal,y}$
Data unit:	GJ/ton
Description:	the weighted average net calorific value of the coal in year *y*
Source of data to be used:	2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 2, Chapter 1, pg 18, *Other bituminous coal (default value)*
Value of data	25.80
Description of measurement methods and procedures to be applied:	An annual check will be performed to ensure that the latest IPCC factor is used in the calculations.
QA/QC procedures to be applied:	N/A
Any comment:	No further comment

Data / Parameter:	$EF_{CO2,coal,y}$
Data unit:	tCO_2/GJ

Description:	the weighted average CO_2 emission factor of fuel type *i* in year *y*
Source of data to be used:	2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 2, Chapter 2, pg 16, *Other bituminous coal (default value)*
Value of data	0.0946
Description of measurement methods and procedures to be applied:	An annual check will be performed to ensure that the latest IPCC factor is used in the calculations.
QA/QC procedures to be applied:	N/A
Any comment:	No further comment

Data / Parameter:	$FC_{BL,prod,LPG}$
Data unit:	tons/year
Description:	The quantity of LPG combusted in the project activity during the year *y*
Source of data to be used:	Allbrick production records and LPG receipts
Value of data	0.57
Description of measurement methods and procedures to be applied:	The LPG used in the retorts will be consolidated into a yearly figure using the LPG invoices.
QA/QC procedures to be applied:	The LPG invoices will be compared with the Allbrick payments for LPG.
Any comment:	The project emissions from LPG are a small portion (<5%) of the emission reductions from the project.

Data / Parameter:	$NCV_{LPG,y}$
Data unit:	GJ/ton
Description:	the weighted average net calorific value of the LPG in year *y*
Source of data to be used:	2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 2, Chapter 1, pg 18, *Liquefied Petroleum Gasses (default value)*
Value of data	47.30
Description of measurement methods and procedures to be applied:	An annual check will be performed to ensure that the latest IPCC factor is used in the calculations.
QA/QC procedures to be applied:	N/A
Any comment:	No further comment

Data / Parameter:	$EF_{CO2,LPG,y}$
Data unit:	tCO_2/GJ
Description:	the weighted average CO_2 emission factor of fuel type *i* in year *y*
Source of data to be used:	2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 2, Chapter 2, pg 16, *Liquefied Petroleum Gasses (default value)*
Value of data	0.0631

Description of measurement methods and procedures to be applied:	An annual check will be performed to ensure that the latest IPCC factor is used in the calculations.
QA/QC procedures to be applied:	N/A
Any comment:	No further comment

Data / Parameter:	$EC_{PJ,grid,y}$
Data unit:	MWh/year
Description:	Quantity of electricity consumed by the project activity in year y
Source of data to be used:	Calculated from the power rating of the motors running the fans on the charcoal retorts and the retort operation plans.
Value of data	394
Description of measurement methods and procedures to be applied:	The power rating of the motors on the fans of the retorts will be used with the retorts' operation plans to calculate the maximum power consumption. The motors will probably run below their maximum rating and the retorts may break down and operate less than planned. Therefore the value is conservative as it will overestimate project emissions rather than underestimate them.
QA/QC procedures to be applied:	N/A
Any comment:	No further comment

Data / Parameter:	$TDL_{grid,y}$
Data unit:	Fraction
Description:	Average technical transmission and distribution losses for providing electricity in year y
Source of data to be used:	Eskom's Annual Report
Value of data	0.067
Description of measurement methods and procedures to be applied:	Eskom measures the losses on their system every year and publishes them in the annual report. http://www.eskom.co.za/annreport09/ar_2009/financial_dir_report.htm
QA/QC procedures to be applied:	N/A
Any comment:	No further comment

Data / Parameter:	Weight of a brick leaving clamp kiln
Data unit:	kg
Description:	The average weight of an Allbrick brick
Source of data to be used:	Weight reading from a calibrated scale
Value of data	2.88
Description of measurement methods	Bricks will be randomly chosen and weighed on a calibrated scale at frequent intervals

and procedures to be applied:	
QA/QC procedures to be applied:	The scale used to weigh the bricks will be regularly calibrated. The weight of individually weighed bricks will be compared with the average weight and large differences will be accounted for in the monitoring report.
Any comment:	No further comment

Data / Parameter:	Brick Quality
Data unit:	Dimensionless
Description:	Class of brick specified in SANS 227 or appropriate national standard
Source of data to be used:	Laboratory test results
Value of data	Class 7 for plaster bricks and Class 14 for foundation bricks
Description of measurement methods and procedures to be applied:	As per SANS 227 or the appropriate national standard. Bricks are randomly sampled throughout the kiln. A batch of 9 bricks is sent for testing every 4 months.
QA/QC procedures to be applied:	As per SANS 227 or the appropriate national standard
Any comment:	Should there be a change of standard during the crediting period; the new standard will be applied to bricks. The class of brick closest to the classes specified above will be deemed to be appropriate.

B.7.2 Description of the monitoring plan:

>>

The onsite monitoring as well as calibration/verification of measurement equipment will be the responsibility of Allbrick. Instruments will be calibrated and checked regularly. Routine maintenance on the monitoring equipment will be the responsibility of Allbrick.

Data will be recorded daily and aggregated monthly. The monthly data will be stored onsite. The monthly data will be recorded in the form that the equations are programmed in to calculate the emission reductions. The calculation of the emissions reductions will be the responsibility of Allbrick. Any exceptions or plant downtime will be recorded in the spreadsheet and made available at verification.

Development of the monitoring report and preparation for verification audits will be the responsibility of Allbrick.

Data to be monitored

The following data will be monitored at Allbrick

- Annual net brick production
- Any coal used on site at Allbrick
  - In the unlikely event that coal is used at Allbrick the weighted net calorific value of the coal and the weighted average CO_2 emission factor will be updated to the latest IPCC values.
- Quantity of LPG used to start the combustion in the charcoal retorts
- Quantity of electricity consumed by the project activity
  - Technical transmission and distribution losses will be updated every year. The grid

emission factor will be updated at the end of the crediting period.

- Weight of bricks leaving clamp kilns
- Brick Quality

Monitoring personnel and data collection
The data that needs to be monitored in this project is such that no new personnel are needed at the factory.

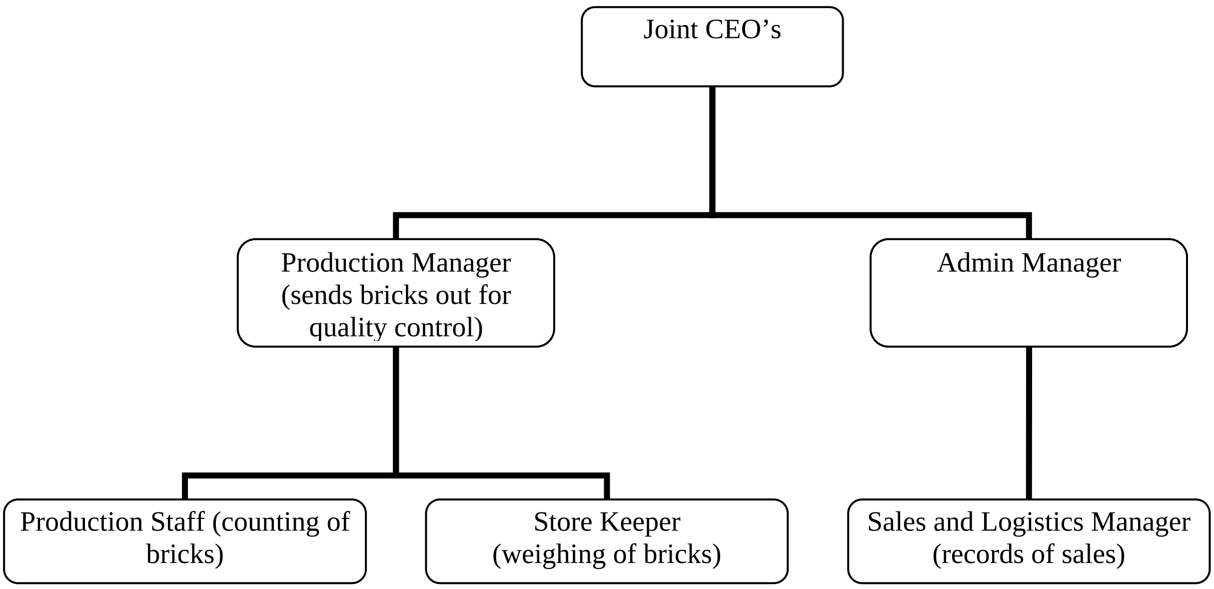
The annual net brick production will be compiled from daily brick packing records. These records are generated on a daily basis and reflect the number of bricks produced from the clamp kilns. The records will be consolidated on a monthly basis. The monthly brick sales are audited yearly with external financial audits at Allbrick.

In the unlikely event that coal is used at Allbrick the data will be captured from the coal delivery receipts.

The LPG that is bought by Allbrick will be monitored. The invoices will be stored on site and the total quantity of LPG used per year will be recorded.

The electrical consumption of the charcoal retorts will be estimated from the nameplate capacity of the motors. This is conservative as the power consumption cannot be underestimated in this way. The operating hours of the charcoal retorts will be used as they stand in the operating plan. It is likely that downtime will occur that is not foreseen in the operational plan, therefore this is conservative as it will overestimate operational hours rather than underestimate them.

Allbrick trains their employees therefore quality bricks are produced at the factory. The quality of the bricks is confirmed with regular testing, a batch of 9 bricks is sent for testing every 4 months,, at external laboratories that comply with the South African National Standard 227. The weight of the bricks is measured on a regularly calibrated scale by an Allbrick employee working in their on-site carbon testing laboratory.



Documentation and Storage
Original documentation will be kept and stored on-site. Hard copies will be kept of all the documentation and soft copies will be kept of the brick sales records. The data will be captured in daily, monthly, and annual intervals. The emission reduction calculations and reports will be kept on site.

All documentation and data will be retained for two years after the end of the crediting period or the last issuance of CERs for this project activity, whichever occurs later.

Responsibility within the organisation structure for monitoring
The joint Chief Executive Officers will oversee the monitoring. The day-to-day operational responsibility for monitoring and record keeping is done by the Production Manager. The Production Manager reports directly to the joint Chief Executive Officers. The actual recording of data will be done by the Allbrick sales and logistics staff (brick sales), the Allbrick carbon testing laboratory staff (store keeper) (brick weight), and Allbrick production personnel (brick production and quality, coal consumption (if any), and LPG used).

QA & QC Procedures
The annual net brick production will be audited regularly with the Allbrick financial audit. Copies of the sales invoices and monthly/yearly aggregated brick sales will also be kept at the factory. Any possible coal use on site will be recorded and delivery notes for the coal will be kept on file. The electrical consumption of the retorts will not need QA&QC procedures as it is calculated from the nameplate capacity of motors and will overestimate rather than underestimate project emissions which is conservative. The weight of bricks leaving the Allbrick factory will be regularly measured on a regularly calibrated scale. Calibration certificates will be kept on file at Allbrick. Brick quality is externally measure in a laboratory that complies with South African National Standards. Therefore there will be no QA&QC procedures in this regard.

B.8 Date of completion of the application of the baseline and monitoring methodology and the name of the responsible person(s)/entity(ies)

>>
Date: 25/03/2010
Entity: Promethium Carbon (Pty) Ltd

SECTION C. Duration of the project activity / crediting period

C.1 Duration of the project activity:

C.1.1. Starting date of the project activity:

>>
01/11/2011

C.1.2. Expected operational lifetime of the project activity:

>>

The expected lifetime of the project activity is 21 years and 0 months.

C.2 Choice of the crediting period and related information:

C.2.1. Renewable crediting period

C.2.1.1. Starting date of the first crediting period:

>>

N/A

C.2.1.2. Length of the first crediting period:

>>

N/A

C.2.2. Fixed crediting period:

C.2.2.1. Starting date:

>>

01/11/2011 (not prior to CDM registration)

C.2.2.2. Length:

>>

10 years

SECTION D. Environmental impacts

>>

D.1. If required by the host Party, documentation on the analysis of the environmental impacts of the project activity:

>>

An environmental impact assessment is not required.

In terms of sections 24 and 24D of the National Environmental Management Act no. 107 of 1998 a basic assessment is required for all activities listed in regulation 386 of 21 April 2006 and a full environmental impact assessment for all activities listed in regulation 387 of 21 April 2006. Clay brick manufacturing is not listed in either of these regulations.

The project has positive environmental impacts:

- Reduction of greenhouse gas emissions
- Avoidance of sulphur and particulate emissions associated with coal combustion

In addition, the project is the first of its kind in South Africa. Allbrick hopes that a new environmentally responsible standard in brick manufacture could be set through the learning and knowledge sharing that occurs as a result of this project.

D.2. If environmental impacts are considered significant by the project participants or the host Party, please provide conclusions and all references to support documentation of an environmental impact assessment undertaken in accordance with the procedures as required by the host Party:

>>
An environmental impact assessment is not required.

SECTION E. Stakeholders' comments

>>

E.1. Brief description how comments by local stakeholders have been invited and compiled:

>>
The individuals and communities that were identified as likely to be affected are listed below:

- Allbrick factory workers
- Surrounding community of Tembalethu, George
- Residents of George
- Sawmills in the George area

The affects of the project will include reduced particulates and SO_2 in the air surrounding the factory, job creation for operators of charcoal retorts and wood waste removal from the sawmills in the surrounding area.

The stakeholders were reached in the following way:
An article describing the Allbrick factory fuel switch from coal to charcoal was drafted in English and in Afrikaans. The English version was published in the *George Herald* and the Afrikaans version was published in *Die Burger*. The English and Afrikaans versions were displayed at the factory site in George and on the main notice board in the George library. Three weeks to a month were allowed for comments to be made on the project activity.

E.2. Summary of the comments received:

>>
There were no comments received.

E.3. Report on how due account was taken of any comments received:

>>
See section E.2. above.

Annex 1

CONTACT INFORMATION ON PARTICIPANTS IN THE PROJECT ACTIVITY

Organization:	Allbrick Manufacturing and Marketing (Pty) Ltd
Street/P.O.Box:	44 13th Street
Building:	
City:	Tembalethu, George
State/Region:	Western Cape
Postfix/ZIP:	
Country:	South Africa
Telephone:	+27 (0)44 880 1189
FAX:	+27 (0)44 880 1100
E-Mail:	allbrick@mweb.co.za
URL:	
Represented by:	Gavin Jooste
Title:	Joint Chief Executive Officer (CEO) and Shareholder
Salutation:	Mr
Last Name:	Jooste
Middle Name:	
First Name:	Gavin
Department:	
Mobile:	+27 (0)82 787 0171
Direct FAX:	+27 (0)44 880 1100
Direct tel:	+27 (0)44 880 1189
Personal E-Mail:	allbrick@mweb.co.za

Organization:	Nedbank Ltd
Street/P.O.Box:	135 Rivonia Road
Building:	
City:	Sandton
State/Region:	Gauteng
Postfix/ZIP:	2196
Country:	South Africa
Telephone:	+27 (0)11 294 4444
FAX:	
E-Mail:	
URL:	www.nedbank.co.za
Represented by:	Kevin Whitfield
Title:	
Salutation:	Mr
Last Name:	Whitfield
Middle Name:	
First Name:	Kevin
Department:	
Mobile:	+27 (0)82 901 5846

Direct FAX:	+27 (0)11 295 2268
Direct tel:	+27 (0)11 294 2268
Personal E-Mail:	KevinWh@nedbank.co.za

Annex 2

INFORMATION REGARDING PUBLIC FUNDING

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Annex 3

BASELINE INFORMATION

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Annex 4

MONITORING INFORMATION

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Annex 5

SUPPORTING DOCUMENTATION

Letter from the Clay Brick Association of South Africa

CLAYBRICK for good

Environmentally Friendly

P O BOX 1284, HALFWAY HOU SE, SOU TH AFRICA 1685
2 SUP ERIOR RO AD (Cnr 16TH RO AD) MIDR AND , SOU TH AFRICA
tel +27 11 805 4206 fax: +27 11 315 3966

www.claybrick.org.za

To Whom It May Concern:

FUEL SWITCH TO CHARCOAL AT ALLBRICK, GEORGE

This letter serves as a confirmation that the Allbrick factory (a member of the Clay Brick Association of South Africa) in George, South Africa is the first South African brick factory to implement a fuel switch from coal to charcoal. The charcoal displaces coal that was used in the clamp kilns and in the bricks.

Yours sincerely,

Mr AJ Coetzee
Executive Director
Clay Brick Association

Emial and Lawyer's response in connection with brick quality

Allbrick

From: "Proline Plett" <prolineplett@telkomsa.net>
To: <allbrick@mweb.co.za>
Sent: 09 April 2009 14:56
Attach: Allbrick NFP March 2009 001.jpg; Allbrick NFP March 2009 002.jpg; Allbrick NFP Ma'ch 2009 003.jpg; Allbrick NFP March 2009 004.jpg; Allbrick NFP March 2009 005.jpg
Subject: FW: Prices / Allbrick

-----Original Message-----
From: Stephen Black kurlandbrick. [mailto:stephen@kurlandbrick.co.za]
Sent: 09 April 2009 08:39 AM
To: prolineplett@telkomsa.net
Subject: FW: Prices / Allbrick

Hi Sean,

Just to follow on form yesterday's conversation. Firstly I must mention that we are very aware of Allbrick's prices. We have always tried to ensure that our clients maintain an edge against builders that purchase bricks from Allbrick. (If our clients are loosing work, then we loose work) At the moment with the market in the state that it is, the fundamental that comes to the fore very quickly is the issue of price.
As I mentioned we are currently working very hard to ensure that we do everything possible to ensure that the price gap is as small as possible, either by means of ensuring waste is absolutely zero (or in some cases unofficially minus zero) Timely deliveries, no down time for brick layers, and a product that will stand the test of time. I mentioned the quality issue on the phone and would like to draw your attention to the pictures attached. These have been forwarded to me via the grapevine, I believe that these pictures where taken on the 13th March 2009! From what I can understand and from what I can see on the photos this doesn't look like it's going to be resolved by issuing some type of discount/settlement. On a similar note, I believe that Allbrick also have serious trouble in Oubaai, where Menno Meinez is the Architect. I understand that core drilling samples are being sort for to conduct quality tests. These poor quality product issues stem from what we understand to be from them no longer firing their product with fossil fuel, alternatively they have opted for a cheaper "pine, charcoal" fuel base. We believe that there is absolutely no comparison when it comes to piece of mind with regards to the quality comparisons of the two products.

NOT ALLBRICK BRICKS

ALLBRICK MPA 18 TO 21
(SANS 227 STD. - 7 TO 14)

I would not normally make mention of these aspects when discussing opposition and prices but I feel that the more cards on the table the better.

We would like to assure you of our best intentions at all times.

Stephen Black

Attorneys / Millers / Prokureurs – Diens aan die Gemeenskap sedert 1891

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VAT No 4530138249

Member of the phatshoane henney group of associated firms.

KURLANDBRIK
e-mail: grblack@mweb.co.za

Our Ref:	Your Ref:	Date:
FS/is/A3804-WA0995	G Black	16 April 2009

Dear Sir/s,

ALLBRICK MANUFACTURING & MARKETING (PTY) LTD t/a ALLBRICK // KURLANDBRIK

We act on behalf of Allbrick.

Our clients have been furnished with an e-mail emanating from your offices under the reference of Steven Black.

Our instructions are that you have been distributing an e-mail to various users of bricks which:

1. contains a series of photographs of bricks, showing damaged bricks, and
2. creating the impression that Allbrick has serious quality problems in the market place in general and with a specific reference to architect Menno Meincz in Dubaai.

We refer to the telephone discussion yesterday between our Mr Bredell and your Mr Graham Black in which we requested you:

1. To ensure forthwith that no further copies of this mail is distributed; and

2. To furnish us with a list of recipients to whom this mail has been circulated.

Our client wishes to record the following:

1. The deductions made in the mail from the photographs distributed is completely out of context;

phatshoanehenney group of associated firms [illegible]

LEGALINK

Also at: Capetown : in association with: Lawrence N. Miller & Associates, Capetown

Directors: [illegible]

Professional assistants: [illegible]

Consultants: [illegible]

2. The reference to Allbrick having serious trouble in Oubaai where Menno Meinez is the Architect is untrue and malicious in that Allbrick bricks were not used on this project.

3. The allegations pertaining to our client's poor quality of bricks made from a different fuel base are malicious, as the bricks manufactured from our fuelbase fully comply with and exceed the SANS 227 Standard.

As a direct result of circulating this e-mail into the market place our client has suffered damages, which from preliminary investigations it estimates could be in the region of R1 million in pecuniary terms, and furthermore has suffered serious harm to its good name and reputation.

Our instructions are that you are to desist from circulating this particular e-mail or any e-mail of a similar nature and to desist from injuring and defaming our client's name and reputation in the market-place.

Furthermore our client insists that a retraction letter, with regards to the content of the email, be forwarded to them without delay.

Our client's rights are fully reserved to take whatever action they may be advised to take including to claim damages.

Please acknowledge receipt and confirm that you will comply with this demand and also furnish us with a list of parties to whom the mail in question has been circulated.

Yours faithfully
MILLERS INCORPORATED - GEORGE

per: