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:

Fuel switch project on the Gluten 20 dryer of Tongaat Hulett Starch Pty (Ltd) Germiston Mill

Version 6
30 July 2008

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

The purpose of the project is to reduce greenhouse gas emissions and unpleasant offgas smells in a product dryer of Tongaat Hulett Starch (Pty) Ltd by switching fuel from coal to natural gas. Natural gas has a lower greenhouse gas emission factor than coal. The fuel switch will lead to a reduction of around 40% in greenhouse gas emissions from the process. An added advantage is better process temperature control which reduces unpleasant offgas smells generated in the plant

Gluten 20 is a product made from wet milled maize. The product enters the final stage dryer at around 60% moisture, and is dried in a rotary drier to around 20% moisture. The rotary dryer was previously heated by hot gas generated in a furnace. The furnace was fired with coal on a chain grate stoker. The project activity involved the decommissioning of the coal fired furnace, and the conversion of the rotary drier by the installation of a directly fired natural gas burner.

Apart from Gluten 20 a range of products are produced from maize on this site. These products are destined for the biscuits, beverages, beer, dog food or paper industries, mainly in South Africa.

The project makes the following contribution to sustainable development:

Environmental:
The project activity eliminates the consumption of coal in the Gluten 20 drying process. This has the following direct environmental benefits:

- The emission of SO_2 due to the combustion of coal is eliminated. It is estimated that the reduction of SO_2 emission from the site due to the fuel switch is in the order of 8 to 10 tons per month of SO_2.
- The emission of particulates from the coal combustion is eliminated.
- The environmental impact of coal mining is reduced.
- The environmental impact of coal ash disposal from the Gluten 20 drying process is eliminated.
- The environmental impacts and emissions associated with coal transport are avoided.

Social:
The implementation of the project has an impact in the reduction of burnt cereal smell from the factory. This has a positive impact on the living conditions in the areas surrounding the mill.

There were no job losses in the implementation of the project.

Economic:

The project operates at a loss however with carbon credits the project will earn foreign reserves for the country.

The Gluten 20 product quality is not affected by the implementation of the project activity.

A.3. Project participants:

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)
Republic of South Africa (host)	Tongaat Hulett StarchPropriety 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 methodology) shall be identified.		

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

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

A.4.1.1. Host Party(ies):

South Africa

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

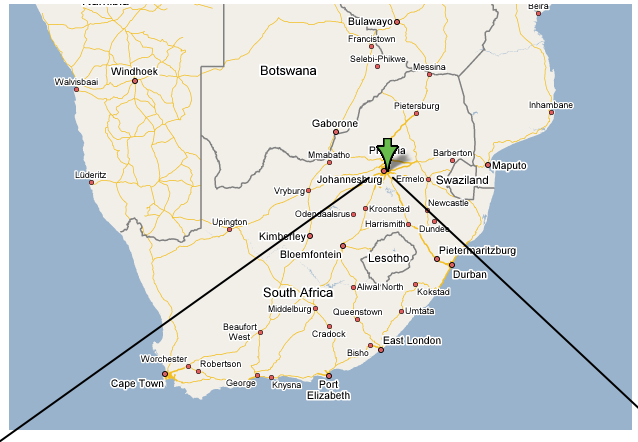
Gauteng Province

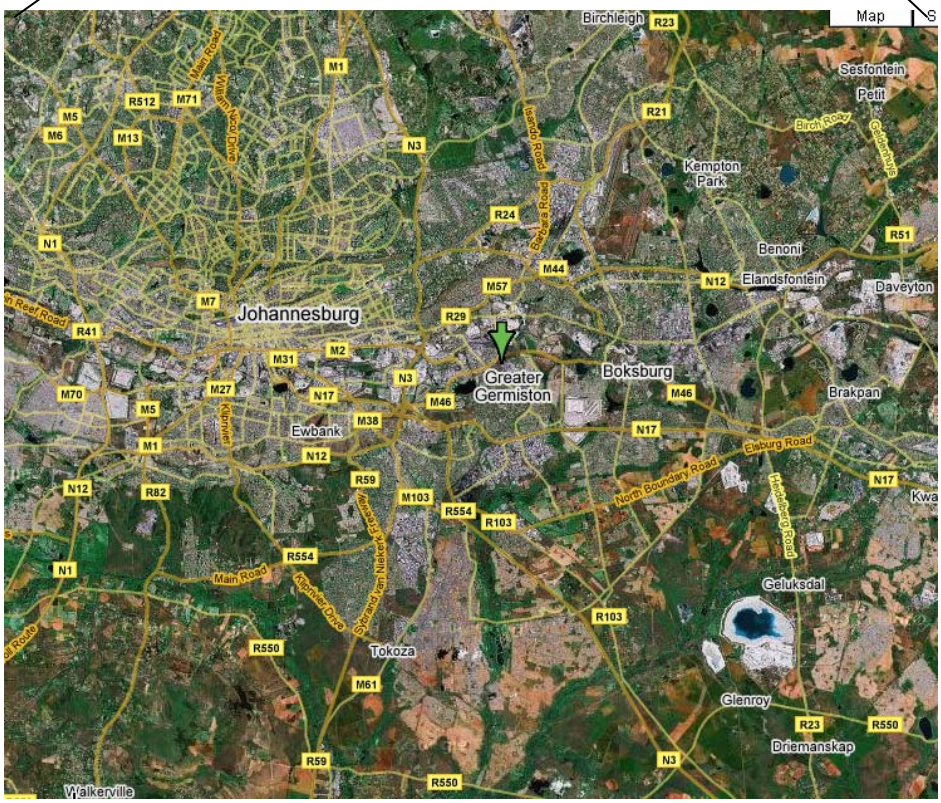
A.4.1.3. City/Town/Community etc:

Germiston

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

The mill is located in Power Street, Germiston





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

The project is of type III B: Switching fossil fuels, Version 12, Scope 1, valid from 2 November 2007.

The technology employed involves the switching from coal to natural gas. The positive environmental impact of this switch is not only limited to a reduction in greenhouse gasses, but have added environmental spin-offs in the reduction of SO_2, particulate emissions as well as a reduction in the environmental impacts associated with the mining and transportation of coal.

The technology of burning natural gas in directly fired heaters has not been used by the project participant prior to the implementation of the project activity. This technology is commercially available in South Africa. Burner, instrumentation and control technology was purchased from local suppliers acting as agents for technology vendors from Annex I countries. See below a photo, taken at night, of the gas burners in front of the gluten20 rotary dryer. The energy required for ignition, is considered negligible.

Photo 1: The gas burner installation of the $Gluten_{20}$ dryer

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

The estimated amount of emission reduction over the chosen crediting period is:

Years	Annual estimation of emission reductions in tonnes of CO2e
2008	8 360
2009	8 360
2010	8 360
2011	8 360
2012	8 360
2013	8 360
2014	8 360
Total estimated reductions (tonnes of CO2e)	**58 520**
Total number of crediting years	**7, renewable twice**
Annual average over the crediting period of estimated reductions (tonnes of CO2e)	**8 360**

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

No public funding has been used in the development or 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:

The size of the dryer in this facility falls well within the limit for small scale projects and the Tongaat Hulett Starch Pty (Ltd) has not registered a similar project within a 1 km radius of the Germiston site, within the previous 2 years. Therefore it is not a debundled component of a large scale project.

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:

AMS III. B. Switching fossil fuels. Version 12

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

The project comprises the switch from coal to gas, both fossil fuels, in an industrial facility. The primary aim for the project was not energy efficiency, therefore AMS II D Energy efficiency and fuel switching for industrial facilities would be applicable but not be the most appropriate category.

The average annual emission reduction is estimated at 8 360 t CO_2, well below the 60 000 t CO_2 reduction limit of this category. Although both coal and natural gas are fossil fuels, natural gas is less carbon intensive.

This fuel switch project is not a project activity under a programme of activities.

B.3. Description of the project boundary:

The project boundary is the Gluten 20 Dryer on the physical site of Tongaat-Hulett Starch Pty (Ltd) in Germiston.

B.4. Description of baseline and its development:

In accordance with the methodology the emission baseline is the emissions per output before the fuel switch. The project baseline is the use of coal, and in the two years preceding the fuel switch an average of 5,037 MJ/ton gluten was needed for drying. The calorific value of the coal purchased is 26.5 MJ/kg coal. The IPCC default emission factor for coal of 0.096 t CO_2/ GJ coal is used. Detail around the data used in the baseline is attached in Annex 3.

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:

In accordance with the simplified modalities and procedures for small scale projects this project activity should demonstrate that it is additional and would not have occurred anyway due to at least one of the following barriers:

(a) Investment barrier: a financially more viable alternative to the project activity would have led to higher emissions;

The baseline of the project is the continued operation of the existing chain grate stoker furnaces and the continued use of coal. Coal has higher emission factor than that of gas.

The capital cost of the fuel switch was R2.24 million. The cost of gas is higher than that of coal on a R/GJ basis. Switching to gas resulted in a loss of R1.8 million per year. This loss does not take the capital expenditure or revenue from carbon credits into consideration. The project participant aims to offset the loss with revenue from the sale of carbon credits.

(b) Technological barrier: a less technologically advanced alternative to the project activity involves lower risks due to the performance uncertainty or low market share of the new technology adopted for the project activity and so would have led to higher emissions;

The burning of coal is less technologically advanced than gas combustion. Tongaat Hulett Starch has not implemented any gas fired drying operation prior to the implementation of this project. The continued operation of the coal based equipment (chain grate stoker furnace) therefore constitute the lower risk alternative.

At the time of the conversion the specification of the gas changed due to the construction of a 865 km pipeline to transport natural gas from Mozambique to South Africa. This necessitated conversion of the design of the network as well as the combustion equipment, which introduced more uncertainty into the project.

(c) Barrier due to prevailing practice: prevailing practice or existing regulatory or policy requirements would have led to implementation of a technology with higher emissions;

South Africa has large reserves of coal, and coal has been, and is, the cheapest energy source for industrial facilities. There is no legislation or policies restricting the use of coal in South Africa, and, in addition, there are no incentives to promote the use of natural gas in any sector.

The prevailing practice at the project participant is the use of coal for the thermal energy requirements. The project activity constitutes a departure from this practice.

(d) Other barriers: without the project activity, for another specific reason identified by the project participant, such as institutional barriers or limited information, managerial resources, organizational capacity, financial resources, or capacity to absorb new technologies, emissions would have been higher.

Commercial risk: The baseline of the project is the continued use of coal. There are numerous of coal suppliers in South Africa. The well traded coal market results in competitive pricing of coal. There is however only one supplier of piped gas in South Africa. The absence of a well traded market introduces a commercial risk to the project.

B.6. Emission reductions:

B.6.1. Explanation of methodological choices:

The fuel switch entailed the addition of a gas installation on site and the retrofitting of the dryer. The IPCC default emission factor for natural gas is 0.056 t CO_2/ GJ natural gas consumed. The dryer conversion was commissioned in April 2006.

In accordance with the small scale methodology no leakage (e.g. fugitive emissions associated with the gas distribution) has to be taken into account.

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

(Copy this table for each data and parameter)

Data / Parameter:	**$Q_{coal,i}$**
Data unit:	Tons of coal per month
Description:	Coal consumption prior to the fuel switch
Source of data used:	Coal receipts
Value applied:	585
Justification of the choice of data or description of measurement methods and procedures actually applied :	Average of two years monthly data, prior to the fuel switch
Any comment:	

Data / Parameter:	**$CV_{coal,i}$**
Data unit:	MJ/kg coal
Description:	Calorific value of coal
Source of data used:	Coal specification
Value applied:	26.5
Justification of the choice of data or description of measurement methods and procedures actually applied :	B grade coal specification is verified through ad hoc third party analysis
Any comment:	

Data / Parameter:	**$Q_{gluten20,}$**
Data unit:	Tons of Gluten20 per month
Description:	Gluten 20 produced in the drier prior to the fuel switch
Source of data used:	Production records
Value applied:	3 040
Justification of the choice of data or description of measurement methods and procedures actually applied :	This value is directly from the electronic production records on the site on an hourly basis, and the monthly totals are generated for financial reporting purposes. This value is an average over the two years preceding the commissioning of the gas conversion
Any comment:	

Data / Parameter:	**EF**
Data unit:	
Description:	
Source of data used:	
Value applied:	
Justification of the choice of data or description of measurement methods and procedures actually applied :	
Any comment:	

B.6.3 Ex-ante calculation of emission reductions:

$BE = (Q_{coal} * CV_{coal} * EF_{coal}) / Q_{gluten20, b}$

Where:

BE	Baseline emission associated with coal prior to the fuel switch, in ton CO_2e /ton gluten20
Q_{coal}	Quantity of coal used in the year prior to the fuel switch in tons consumed
CV_{coal}	Annual average net calorific value of the coal purchased in GJ/ton coal
EF_{coal}	Emission factor for coal in ton CO_2e /GJ
$Q_{gluten20, b}$	Average annual quantity of gluten 20 production in the dryer prior to the fuel switch in tons produced

$PE_y = (Q_{gas, y} * EF_{gas}) / Q_{gluten20, y}$

Where:

PE_y	Project emission associated with the use of gas in the drier, in ton CO_2e /ton gluten20
$Q_{gas, y}$	Quantity of gas used in year y in GJ
EF_{gas}	Emission factor for gas in ton CO_2e /GJ
$Q_{gluten20, y}$	Annual quantity of gluten 20 production in the dryer in year y, in tons produced

$ER_y = (BE - PE_y)* Q_{gluten20, y}$

Where

ER_y	Emission reduction in year y, in ton CO_2e
BE	Baseline emission associated with coal prior to the fuel switch, in ton CO_2e /ton gluten20
PE_y	Project emission associated with the use of gas in the drier, in ton CO_2e /ton gluten20
$Q_{gluten20, y}$	Annual quantity of gluten 20 production in the dryer in year y, in tons produced

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

Year	BE	PE	$Q_{glten20}$	Emission reduction
2008	0.489	0.232	32,500	8,360
2009	0.489	0.232	32,500	8,360
2010	0.489	0.232	32,500	8,360
2011	0.489	0.232	32,500	8,360
2012	0.489	0.232	32,500	8,360
2013	0.489	0.232	32,500	8,360
2014	0.489	0.232	32,500	8,360

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

B.7.1 Data and parameters monitored:

(Copy this table for each data and parameter)

Data / Parameter:	**$Q_{NG,i}$**
Data unit:	GJ
Description:	Gas consumption in the dryer
Source of data to be used:	Gas meter reading
Value of data	134 740
Description of measurement methods and procedures to be applied:	Continuous meter reading, reported electronically monthly
QA/QC procedures to be applied:	Calibrated meter is in place. Internal check of gas/grind ratio is performed on a daily basis by the production manager
Any comment:	

Data / Parameter:	**$Q_{gluten20, y}$**
Data unit:	Ton
Description:	Gluten production in year y
Source of data to be used:	Production volumes as per weigh bridge and stock take records
Value of data	32 500
Description of measurement methods and procedures to be applied:	This is key production parameters and is managed via the actual weights leaving the facility and stock take records
QA/QC procedures to be applied:	Internal audits and actual weigh bridge data
Any comment:	

Data / Parameter:	**EF**
Data unit:	
Description:	
Source of data used:	
Value applied:	
Justification of the choice of data or description of measurement methods and procedures actually applied :	
Any comment:	

B.7.2 Description of the monitoring plan:

The emission reduction will be calculated, in accordance with the methodology, as the difference between the baseline emissions and project emissions.

The monitoring plan involves the continued monitoring of the natural gas consumption and the corresponding gluten20 production.

The dryer has its own gas meter that was calibrated upon installation and maintained in accordance with product instructions.

The responsibility of the daily electronic data procedures is with the production manager. The financial system, SAP, is the responsibility of the financial manager and emission reduction reporting will be programmed into the current system.

As an ISO 9001 certified operation, internal quality audits will be performed on the dryer and associated equipments.

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

The application of the baseline and monitoring methodology was completed by Promethium Carbon (Pty) Ltd in July 2007. Promethium is not a project participant.

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:

1 April 2006

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

The equipment, meters and gas burners as well as the drier has a projected lifespan of 21 years if well maintained, exceeding the lifetime of the CDM project.

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:

1 March 2008

C.2.1.2. Length of the first crediting period:

Seven years

C.2.2. Fixed crediting period:

C.2.2.1. Starting date:

Not applicable

C.2.2.2. Length:

Not applicable

SECTION D. Environmental impacts

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

No environmental impact assessment is needed for fuel switching in South Africa. The environmental impact of the fuel switch is however positive as the local air quality, with regards to particulates and smell is improving.

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:

The environmental impact of this project is not considered significant.

SECTION E. Stakeholders' comments

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

The reduction in smell in the area, reduced the number of complaints that the local municipal was dealing with. Lists of complaints before and after the fuel switch is available on site as part of the quality documentation. The neighbours, local business and local communities were informed about the CDM gas dryer initiative at the Germiston mill via the regional newspaper (Germiston City Press) and no comments were received .

E.2. Summary of the comments received:

Not applicable

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

Not applicable

Annex 1

CONTACT INFORMATION ON PARTICIPANTS IN THE PROJECT ACTIVITY

Organization:	Tongaat Hulett Starch Propriety Limited
Street/P.O.Box:	Private Bag 2019, Isando 1600 South Africa
Building:	Daniel Place, 2 Dick Kemp street
City:	Meadowdale, Germiston
State/Region:	Gauteng
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Country:	South Africa
Telephone:	
FAX:	
E-Mail:	Daniel.loubser@tonstarch.co.za
URL:	http://www.tongaathulettstarch.co.za/
Represented by:	
Title:	
Salutation:	Mr.
Last Name:	Loubser
Middle Name:	
First Name:	Daniel
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Annex 2

INFORMATION REGARDING PUBLIC FUNDING

No public funding was used in either the development or implementation of this project

Annex 3

BASELINE INFORMATION

Data for coal consumption used in the baseline calculations

Date	Coal consumed in tons	Actual cost	Gluten 20 production in tons
Apr-04	627.6	R 135,857.98	2,646
May-04	668.5	R 138,185.36	2,810
Jun-04	564.8	R 108,470.36	2,770
Jul-04	504.1	R 107,883.82	2,615
Aug-04	527.5	R 112,876.44	2,244
Sep-04	725.4	R 155,242.02	3,283
Oct-04	576.3	R 123,326.06	2,861
Nov-04	681.0	R 145,727.58	3,313
Dec-04	484.3	R 103,635.92	3,008
Jan-05	520.8	R 111,446.92	2,933
Feb-05	414.7	R 88,739.38	3,044
Mar-05	466.4	R 99,805.32	2,788
Apr-05	579.1	R 123,925.26	3,254
May-05	669.0	R 139,444.50	3,615
Jun-05	569.1	R 120,252.97	3,634
Jul-05	579.9	R 121,510.57	3,212
Aug-05	497.8	R 103,055.27	3,486
Sep-05	674.5	R 139,615.92	3,323
Oct-05	599.0	R 123,984.73	3,054
Nov-05	690.7	R 142,973.87	3,457
Dec-05	653.2	R 135,216.54	3,135
Jan-06	620.8	R 128,514.00	2,845
Feb-06	692.6	R 143,361.86	2,867
Mar-06	448.0	R 92,731.15	2,758

Annex 4

MONITORING INFORMATION

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