Clean Development Mechanism South Africa
Designated National Authority

energy
Department:
Energy
REPUBLIC OF SOUTH AFRICA

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Project Design Document (PDD)

Project reference number (office	
Date received (office use only)	

NOTES ON COMPLETING THIS PROJECT DESIGN DOCUMENT

1. Please provide this PDD in both hard-copy

Part A: Project Proponent Details

Project Name	PoA: Biomass residues power generation Programme	1st CPA: Amatikulu CPA - Renewable Energy Generation Facility
Date of Submission of PDD	26/07/2012	

	PoA	**1st CPA**
Project Developer		
Name	Standard Bank Plc	Tongaat Hulett Ltd
Organizational Category	*Private Company*	*Private Company*
Legal Status	*Listed company*	*Listed company*
Street Address	20 Gresham Street London EC2V 7JE United Kingdom of Great Britain and Northern Ireland	Private Bag 3 Glenashley 4022 KwaZulu-Natal South Africa
Postal Address (if different from above)	-	-
Website Address	www.standardbank.com	www.tongaat.com
Main Activities	South Africa's largest financial	Major agribusiness company

	services groups, it operates in 30 countries around the world, including 17 in Africa, and employs 52,000 persons.	of southern Africa that focuses on sugar, land management and property development, with operations in South Africa, Mozambique, Swaziland and Zimbabwe.
Summary of Financial Performance in last fiscal year	*Total assets : US$ 201,9 Billion* *Revenue : US$ 16,6 Billion* *Net income : US$ 1,6 Billion*	*Total assets : US$ 2,38 Billion* *Revenue : US$ 1,61 Billion* *Net income : US$ 136 Million*
Contact Person(s)	Geoff Sinclair	Dave Meadows
Telephone	Work: +44 20 3145 6890 Cell: +44 7769 648 695	Work: +27 32 439 4019 Cell: +27 32 4394311
Fax	+44 20 3189 6930	+27 83 3868342
Email Address	co2@standardbank.com	Dave.Meadows@tongaat.com

Project Partners Provide the following Information for **all** project partners (copy and paste relevant sections of the table if information is to be provided on more than one partner organisation)	
Name	ecosur afrique
Nature of partner	*CDM consultant*
Organizational Category	*Private Company*
Legal Status (if private company)	*Privately held company*
Street Address	*9th Floor, Raffles Tower, 19 Cybercity, Ebene, Mauritius*
Postal Address (if different to Street Address)	-
Website Address	www.ecosurafrique.com
Main Activities	*Leading advisory and brokerage group operating in carbon markets across Africa*
Contact Person(s)	*Alexandre Dunod*
Telephone	Work: +230 404 60 60 Cell: +230 98 456 49
Fax	+230 468 1616
Email Address	a.dunod@ecosurafrique.com
Contractual Arrangements	
Contractual arrangements between various entities involved	*ecosur afrique is not a project participant*

Part B: Project Overview (Technical Summary, Location and Schedule)

	PoA	**1st CPA**
Technical Summary of the project		
Objective of the Project	The Biomass residues power generation Programme aims to promote and support the implementation, replacement or retrofit of power-and-heat plants, utilizing biomass residues as primary fuel. Extra electricity is likely to be exported into the	Amatikulu CPA consists in the installation and operation of a state-of-the art renewable energy facility and associated infrastructure at Tongaat Hulett Ltd's Amatikulu Sugar Mill, within the Umlalazi Local Municipality. Tongaat Hulett will

	electrical distribution grid, displacing the equivalent power generated from a fossil-fuel intensive baseline energy mix.	inject 291,692 MWh per year to the grid of South Africa.
Project Description The technology or measures to be employed by each CPA fall into Sectoral Scope 1: Energy Industries (renewable sources) as it concerns the implementation, replacement or retrofit of biomass-residue (co-) fired power-and-heat plants. A typical CPA will consist in processing biomass residue for the generation of process heat and electricity through boilers and turbo-alternators. Excess of electricity may be exported into the electrical distribution grid of South Africa.		The project will comprise the generation of steam electricity through high performance boilers (110 bar) and turbo-alternators (91 MW), utilising sugar cane fibre as primary fuel, complemented with cane leaves and woodchips. The excess electricity is to be exported into the South African electrical distribution grid via a new underground power line that will link up to the Amatikulu substation.
Project Constraints ***Barriers faced by the proposed PoA:*** Policy barriers (Wariness of utility monopoly, Shifting policies and regulations, Legal challenges to REFIT's bidding process		Other barriers faced at CPA level – Investment barrier – Technological barrier – Barrier due to prevailing practice (first-of-its-kind)
Technology to be employed	Power-and-heat plants encompass two broad categories of power plants: - cogeneration plants (power-and-heat plant in which at least one heat engine simultaneously generates both heat and power) and - plants in which heat and power are produced at the same installation although not necessarily in cogeneration mode, e.g. heat is extracted directly from a common heat header that also supplies heat to heat engines for power generation.	The proposed renewable electricity generation facility will consist of two new high-pressure boilers at 110 bar and two turbo-alternators for the generation of 91 MW of electricity, along with the associated plant, to be commissioned in 2016. The boilers will be fed from a supply of sugar cane fibre (bagasse), supplemented by cane leaves (10% of cane-based heat) and wood chips (5% of total heat). *Is the technology one that has been previously tried and tested in South Africa or internationally?* - Technology is first-of-its-kind in South Africa but already existing and successfully operated in India, Brazil,… *Have the project operators had any previous experience or expertise with operating the technology?* - Project operators have operated the baseline power plant at Amatikulu for 47

		years.
Greenhouse Gases Targeted	CO_2	
Emission reductions	*Indicate the expected emission reductions that will occur due to the project.*	Annual: 267,255 tCO_2/y Total: 2,672,255 tCO_2 over 10y
Baseline & Additionality Assessment *Provide an indication of the baseline and additionality approach to be used, with a brief explanation of why the project is additional as defined under the Kyoto Protocol.*	PoA baseline consists in fossil-fuel intensive baseline energy mix. Power-and-heat generation from biomass residues is not mandatory, thus the proposed PoA is a voluntary coordinated action from the CME to promote the implementation, replacement or retrofit of power-and-heat plants in South Africa. Additionality is demonstrated at CPA level, following the *Tool for the demonstration and assessment of additionality*	In the baseline scenario, the bagasse would still be combusted in a low efficiency cogeneration unit to ensure the sugar factory's heat and power needs (i.e. with 370°C/32 bar boilers and 12 MW of backpressure turbine capacity), occasionally complemented with 5-10% of coal in case of bagasse supply interruption and maintenance. The sugar cane leaves would still be burnt at the fields. The proposed project activity is additional because identified as the First-of-its-kind: (i) The project is the first in the applicable geographical area that applies a technology that is different from any other technologies able to deliver the same output and that have started commercial operation in the applicable geographical area before the start date of the project; *(ii)* Project participants selected a crediting period for the project activity that is "a maximum of 10 years with no option of renewal";
Monitoring	- Biomass residues categories and quantities used in the project activity - CH_4 emission factor for uncontrolled burning of the biomass residues - CO_2 emission factor for fossil fuel - Baseline process heat generation - Gross quantity of electricity generated in all power plants which are located at the project site and included in the project boundary - Project electricity imports from the grid - Total auxiliary electricity consumption required for the operation of the power plants at the project site - Net calorific value of biomass residue - Moisture content of the biomass residues - Quantity of fuel type *i* combusted in process *j* - Return trip road distance between the origin and destination of	

	freight transportation activity - Quantity of waste water generated
Type of project/activities	*Identify which type of activity is involved in this project – and for each, provide brief details*
a. Energy Supply	*Biomass/ Cogeneration* The proposed PoA is an initiative to promote and support the implementation, replacement or retrofit of power-and-heat plants in South Africa, utilizing biomass residues.
b. Energy Demand	*Not applicable*
c. Industrial Process	*Not applicable*
d. Transport	*Not applicable*
e. Waste Management	*Not applicable*
f. Forestry/ land use	*Not applicable*
g. Other	*Not applicable*
Project Boundary Define the Project Boundary (Approximately 1 paragraph)	- All plants generating power and/or heat located at the project site, whether fired with biomass residues, fossil fuels or a combination of both; - All power plants connected physically to the electricity system (grid) that the project plant is connected to; - Where possible, all off-site heat sources that supply heat to the site where the project activity is located (either directly or via a district heating system); - The means of transportation of biomass residues to the project site; - The site where the biomass residues would have been left for decay or dumped; - The wastewater treatment facilities used to treat the wastewater produced from the treatment of biomass residues.
Indicate Emissions outside the Project Boundary	The main potential source of leakage for this project activity is an increase in emissions from fossil fuel combustion or other sources due to diversion of biomass residues from other uses to the project plant as a result of the project activity. Changes in carbon stocks in the LULUCF sector are expected to be insignificant since this methodology is limited to biomass residues

	PoA	**1st CPA**
Location of the Project		
Province	The geographical boundary of the PoA will cover the 9 provinces of South Africa.	KwaZulu-Natal
Municipality		Umlalazi
Nearest city/large town		Amatikulu
Brief description of the location of the project site		The facility is to be established within the property of the Amatikulu Sugar Mill, which borders the Matigulu River, along the R66 Road, co-ordinates 29°02'44.69"S and 31°31'35.65"E.

	PoA	**1st CPA**
Project Schedule/Timetable		
Earliest Project Start Date	01/07/2012	20/09/2012
When is the expected first year	2016	

of CER delivery		
Project Lifetime	28 years	> 25 years
Project End Date	30/06/2040	31/12/2025
Crediting Period	*Has a crediting period for the project been identified*?	*10 years*
Current Status or phase of the project	*Select most applicable: Under discussion/ planning/preparation/construction or other actions already commenced/ Other (explain)* *Please provide brief details (1-2 lines)*	*Planning stage* Expected date of commissioning of Amatikulu CPA : 01/01/2016
DNA Approval	*Has this project been submitted to the DNA for approval previously*?	*No*
Approval by other bodies	*Has this project (or any elements of the project) been submitted to any other national, provincial or local government departments or agencies for regulatory or legal approval (excluding EIA process – see Part C). If so – provide brief details.*	*No*

Part C: Performance Against the DNA's Sustainable Development Criteria

South Africa has identified the following sustainable development criteria and indicators against which each CDM project will be assessed. Please provide your interpretation of how this project will address each of these **criteria and indicators** where they are relevant to the project. If the space provided is not sufficient please append additional information as required.

NOTE: For all indicators which are of relevance to the project show how the performance of the project against these indicators can be objectively monitored and measured on an ongoing basis.

1. Economic: Does the project contribute to national economic development?

This PoA will enable power-and-heat plants to be developed or expanded throughout South Africa and help creating an additional revenue stream within the national agro-industry, especially in rural area. Foreign exchange requirements are likely to be reduced because of fossil fuel imports reduction, which will also decrease the cost of energy.
Besides, the PoA will enable technology transfer to South Africa by involving world-class power-and-heat equipments and skills to be durably set up locally and replicable throughout the programmatic approach.

2. Social: Does the project contribute to social development in South Africa?

CDM Project Activities included under this PoA will generate additional employment opportunities throughout South Africa with a focus on local communities. Moreover by contributing to renewable energy generation in South Africa, this PoA will serve the improvement of quality of life of the South African people currently confronted with a national shortfall, including electrification opportunities in rural areas.

3. Environmental: Does the project conform to the National Environmental Management Act principles of sustainable development?

The proposed PoA is desirable in that it will aid in addressing the current electricity supply constraints in

South Africa. This type of electricity generation facility is more environmentally friendly than the coal-derived power currently serving much of the regional electrical distribution grid. Coal-derived power plants tend to emit more harmful gasses, such as sulphur dioxide and nitrogen oxides, and are more carbon-intensive, as well as being unsustainable in the long-term. The PoA will promote the recovery and utilization of biomass residues currently abandoned or incompletely tapped (e.g. "green harvesting" amongst certain sugar cane growers/suppliers, decreasing the burning of sugar cane and associated environmental impacts).	
	1st CPA
i) That the **disturbance of ecosystems and loss of biological diversity** are avoided, or where they cannot be avoided, are minimised and remedied	'Green harvesting' of sugar cane crops will reduce the number of fauna killed/displaced by the more traditional burning of crops.
ii) That **pollution and degradation of the environment** are avoided, or where they cannot be altogether avoided, are minimised and remedied	*Air quality* - Mitigation measures such as the proposed dry scrubbing of the boiler flue gas will ensure the reduction of particulate matter. Dust nuisance created during the construction phase can be easily mitigated with measures such as suppression through the dampening of exposed soil.
iii) That the **disturbance of landscapes and sites that constitute the nation's cultural heritage** is avoided, or where it cannot be altogether avoided, is minimised and remedied	*No topography/visual impacts* *Surface water* - Provided that the reservoir is constructed to the design dimensions recommended in the hydrology study, and that it does not increase the total amount of water abstracted from the river, there should not be any negative impact.
iv) That **waste is avoided**, or where it cannot be altogether avoided, minimised and reused or recycled where possible and otherwise disposed of in a responsible manner	Results of TCLP testing undertaken for sites similar to Amatikulu, where the disposal of boiler ash on sugar cane fields is currently taking place, will give an indication as to whether the proposed development will have an impact on soil quality.
v) That **the use and exploitation of non-renewable resources is responsible and equitable**, and takes into account the consequences of the depletion of the resource	Displacement of coal derived electricity currently making up the majority of the regional power supply: positive impact
vi) That the **development, use and exploitation of renewable resources is responsible and equitable**, and takes into account the consequences of the depletion of the resource.	Decrease of local farmers burning sugar cane crops prior to harvesting (in favour of 'green harvesting') will improve air quality in the immediate area: positive impact).
vii) That **a risk averse and cautious approach** is applied, which takes into account the limits of current knowledge about the consequences of decisions and actions	Any negative impacts arising as a result of the proposed development should be easily mitigated, although this can only be confirmed by the specialist studies to be undertaken as part of the EIA phase.
vii) That **negative impacts on the environment and on people's environmental rights** be anticipated and prevented, and where they cannot be altogether prevented, are minimised and remedied	*Social:* Local people should be given preference for jobs created during the construction phase of the development. Economic: The proposed development will help create an additional revenue stream within the local sugar industry (positive impact) *Noise:* Turbo alternators to be enclosed so as to prevent noise. Noise impact will not be noticeable due to high ambient noise level currently at the mill. All employees operating and within close proximity to the facility to wear hearing protection at all times.
Other comments **Please provide any other comments on how this project contributes to sustainable development in South Africa** CDM Project Activities included under this PoA will bring benefits to both the participating companies and the local communities involved, as well as global benefits at the national level.	

Indicators in Support of the Project Approval Criteria			
Category		**Indicator**	**Comment**
Environmental	Impact on local environmental quality	• Impact of the project on air quality • Impact of the project on water pollution • Impact of the project on the generation or disposal of solid waste • Any other positive or negative environmental impacts of the project (such as impacts on noise, safety, visual impacts, or traffic)	Amatikulu CPA will aid in addressing the current electricity supply constraints in South Africa. This type of electricity generation facility is more environmentally friendly than the coal derived power currently serving much of the regional electrical distribution grid. Coal-derived power plants tend to emit more harmful gasses, such as sulphur dioxide and nitrogen oxides, and are more carbon-intensive, as well as being unsustainable in the long-term. Besides, the CPA will promote the recovery and utilization of biomass residues currently abandoned or incompletely tapped, as well as "green harvesting" amongst certain sugar cane growers/suppliers, therefore decreasing the burning of sugar cane and associated environmental impacts.
	Change in usage of natural resources	• Impact of the project on community access to natural resources • Impact of the project on the sustainability of use of water, minerals or other non renewable natural resources • Impact of the project on the efficiency of resource utilisation	
	Impacts on biodiversity and ecosystems	• Changes in local or regional biodiversity arising from the project	
Economic	Economic impacts	• Impact of the project on foreign exchange requirements • Impact of the project on existing economic activity in the area • Impact of the project on the cost of energy • Impact of the project on foreign direct investment	Amatikulu CPA development will help creating an additional revenue stream within the national sugar industry. Besides, the CPA will enable technology transfer to South Africa by involving world-class power-and-heat equipments and skills to be durably set up locally and replicable throughout the programmatic approach.
	Appropriate technology transfer	• Positive or negative implications for the transfer of technology to South Africa arising from the project • Impacts of the project on local skills development • Demonstration and replication potential of the project	

Social	Alignment with national provincial and local development priorities	• How the project is aligned with provincial and national government objectives • How the project is aligned with local developmental objectives • Impact of the project on the provision of, or access to, basic services to the area • Impact of the project on the relocation of communities if applicable • Contribution of the project to a any specific sectoral objectives (for example, renewable energy targets)	Amatikulu CPA's construction and establishment will create a number of jobs, both temporary and permanent, and promote local enterprise development, for which the local community will be a privileged beneficiary. Moreover by contributing to renewable energy generation in South Africa, this CPA will serve the improvement of quality of life of the South African people currently confronted with a national shortfall.
	Social equity and poverty alleviation	• Impact of the project on employment levels? (specify the number of jobs created/lost; the duration of time employed, distribution of employment opportunities, types of employment, categories of employment changes in terms of skill levels and gender and racial equity) • Impact of the project on community social structures • Impact of the project on social heritage • Impact of the project on the provision of social amenities to the community in which the project is situated • Contribution of the project to the development of previously underdeveloped areas or specially designated development nodes	

General	General Project Acceptability	• Are the distribution of project benefits deemed to be reasonable and fair?	Tongaat Hulett initiative will consequently increase profitability across the whole value chain of the sugar industry, thus widely sharing the benefits from the small local growers (whose earnings will rise) to the surrounding communities and country-wide electricity consumers.

Part D: Finance

	1st CPA
Project Costs	
Development Costs (R's)	R162 million
Installed Costs (R's)	R3623 million
Other Costs (R's)	R150 million
Total Project Costs (R's)	R3935 million
Sources of Finance	
Equity	Not yet finalised
Debt (long term)	Not yet finalised
Debt (short term)	Not yet finalised
Amount not identified (R's)	Not yet finalised
Total CDM Contribution sought	267 255 CERs p.a., with 80% of realised value to accrue to the project
Expected Price of CER in case of a contract to purchase for: A period of 10 years	€6/CER; R10.50/€; escalation of 5.7% p.a.
Indicate the **projected Internal Rate of Return** for the project with and without CER revenues.	IRR without CERs = 16.5% IRR with CERs = 16.9% Based on preliminary assumptions.
Constraints on tradability of carbon credits	None
Preliminary discussions with potential purchasers	1st CPA to be included in the PoA owned by Standard Bank (carbon credits purchaser).