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	Grahamstown Invasive Biomass Power Project
Date of Submission of PDD	20/09/2012

Project Developer	
Name	Nollen Group
Organizational Category	Private Company
Legal Status	Limited company
Street Address	47 Strand, Office 603 Cape Town, Western Cape - 8001 Republic of South Africa
Postal Address (if different from above)	
Website Address	www.nollengroup.com
Main Activities	Nollen Group manages dedicated capital that targets growth – oriented industries in emerging economies with a focus on

	renewable energy, water treatment, sustainable forestry, conservation and rural economic development. Nollen Group seeks to catalyze sustainable investment opportunities in smaller and medium scale investment.
Summary of Financial Performance in last fiscal year	As at the end of the last fiscal year there has been no revenue or profit to speak of - just incoming funds to keep projects going. Current total asset value is R476 426.84.
Contact Person(s)	Mr. Charles Kennedy Cox
Telephone	Work: +27 (0)21-422-4392 Cell: +27 (0)83-685-6863
Fax	+27 (0)21-422-4392
Email Address	Charlie@nollengroup.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	Bunge Emissions Holdings SARL
Nature of partner	CER Buyer, CDM Consultant
Organizational Category	Private Company
Legal Status (if private company)	Limited Company
Street Address	13, Rte de Florissant, Geneva 12, CH 1211, Switzerland.
Postal Address (if different to Street Address)	
Website Address	
Main Activities	Company provides the consulting services for developing emission reduction projects and solution for renewable energy projects development.
Contact Person(s)	Mr. Alfred Evans
Telephone	Work: +41225929765 Cell:
Fax	+41 22 5803 360
Email Address	alfred.evans@bunge.com
Contractual Arrangements	
Contractual arrangements between various entities	Nollen Group has signed the term sheet with the Bunge Emissions holding SARL.

involved	

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

Technical Summary of the project	
Objective of the Project	The objective of the project activity is to utilize the invasive biomass for the generation of clean electricity. The electricity generated by the project activity will be supplied to the national electricity grid.

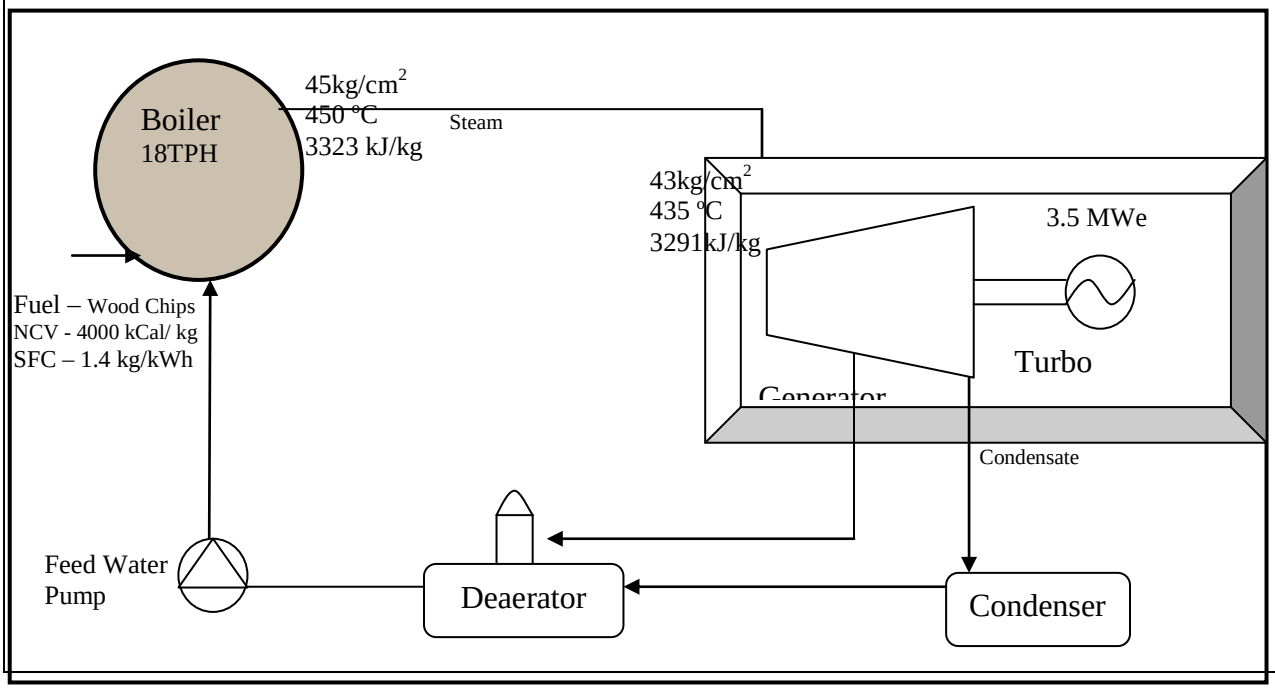
Project Description

The proposed project activity, "Grahamstown Invasive Biomass Power Project involves the installation of 3.5 MWe biomass based power plant at Grahamstown, Eastern Cape of Republic of South Africa by Nollen Group.

Since the project activity generates electricity through sustainable means, it will not cause any negative impact on the environment and there by contribute to climate change mitigation efforts. The project activity will replace equivalent amount of energy in the national electricity grid which is pre-dominantly sourced from fossil fuel based power plants.

The technology being employed in the project activity will comprise one 18 TPH biomass fired boiler and one 3.5 MWe steam Turbo Generator Set. GIBPP involves the utilization of wood chips from Invasive Alien Plants[1] (IAPs) as the sustainable biomass feedstock. The wood chips will be combusted in the boiler to produce steam at 45 kg/cm^2 and 450ºC, this high pressure high temperature steam will be utilized to drive the steam turbo generator to generate the electricity.

Energy flow diagram



[1] Annexure-1- Invasive Alien Plants (IAPs) – Renewable & Sustainable biomass

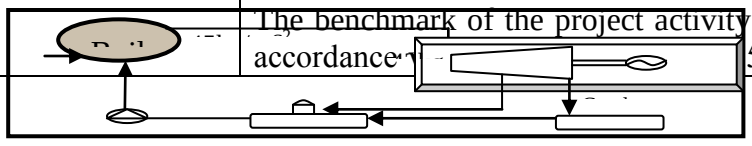
Technical Summary of the project

Project Constraints

Are there any constraints affecting project operations or commissioning? *(Brief description: 1 paragraph or less) Note: these may be due to energy supply, infrastructure, other resources et*

The possible constraints are securing the feedstock from private land owners in the vicinity of the power plant and the use of municipality electricity transmission lines. Already both these constraints have been mitigated, the land owners has shown their support for the project and appreciated Nollen Group for the competing use of Invasive Alien Plants for energy generation and at the same time contributing in national efforts to save the native flora & fauna and conservation of water. Makana Municipality have also given their support to the project and confirmed that the project will be able to utilize the existing power transmission lines.

Technology to be employed	The technology is well known in South Africa as well as internationally. The proposed project activity involves the installation of one 18 TPH biomass fired steam boiler to generate high pressure (45 kg/cm^2) and superheated (450 ºC) steam. The entire quantity of the generated Steam will be supplied to the steam turbo generator for power generation. The rated capacity of turbo generator is 3,500 kW. The EPC provider has the expertise in operating the project technology. Project design, engineering, equipment supply, installation, supervision, start-up, and training for the power plant system will be supplied by the project EPC provider. The know-how for operating the power plant is being transferred through training.
Greenhouse Gases Targeted	The Project will target the reduction in Carbon Dioxide CO_2 associated with coal fired electricity which forms the major component of South Africa's electricity mix.
Emission reductions	The estimated annual average emission reduction from the project activity will be 22,562 tCO_2e and the total GHG emission reductions for the chosen fixed crediting period will be 225,620 tCO_2e
Baseline & Additionality Assessment	PP has established the baseline in accordance with the applicable methodology AMS-I.D ver 17 para 10 and additionality approach in accordance with CDM project standard para 96 (a) 'Attachment A to Appendix B of the simplified modalities and procedures' and further following the "Non-binding practice examples to demonstrate additionality for SSC project activities" The benchmark of the project activity has been established in accordance with [illegible] of the "GUIDELINES



Technical Summary of the project	
	ON THE ASSESSMENT OF INVESTMENT ANALYSIS", version 5. In order to evaluate the profitability of the proposed project activity an investment analysis of the project activity has been conducted. The proposed benchmark for the project is considered post tax, therefore the project Internal Rate of Return (IRR), post tax, has been considered as the most suitable financial indicator for the project activity. The project IRR (Post - tax) 5.18% for the project activity without CDM revenue has been found to be well below the benchmark value of 12.17%.
Monitoring	The monitoring parameter as per the applicable methodology AMS-I.D version 17 for the project activities will be: 1. Net quantity of electricity supplied to the grid. 2. Biomass quantity consumed in the project activity in the year y 3. Net calorific value of the fuel used 4. Moisture Content 5. Diesel consumption in the DG set if any
Type of project/activities	*Identify which type of activity is involved in this project - and for each, provide brief details*
a. Energy Supply	Project Activity is a renewable biomass based power generation project falls under the CDM sectoral scope 1- Energy industries (renewable - /non-renewable sources)
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 The project boundary covers the point of fuel storage to the point of power export to the grid where the project proponent has a full control. Thus, the boundary covers fuel storage and processing, boiler, Steam Turbo Generator set and all other power generating equipments and electricity grid	
Indicate Emissions outside the Project Boundary	NIL

Location of the Project	
Province	Eastern Cape
Municipality	Makana
Nearest city/large town	Grahamstown

Brief description of the location of the project site	The power plant will be located at the site of an original coal-fired power plant that used to supply electricity to Grahamstown and the surrounding area. The project site is situated about 2 km west of the centre of Grahamstown. Grahamstown is a small city approximately 100 km northeast of Port Elizabeth, in the Eastern Cape, South Africa

Project Schedule/Timetable	
Earliest Project Start Date	2011/October
When is the expected first year of CER delivery	2013
Project Lifetime	20 years
Project End Date	2023
Crediting Period	Fixed Crediting Period of 10 years
Current Status or phase of the project	Project is under preparation stage. Nolen Group has identified the project site, received Makana municipality NOC and is in negotiation with the private land owner for biomass. Nollen Group has signed MOU with technology provider also signed the term sheet with CER buyer. Nollen group is waiting for the Bid Submission date for the PPA under Renewable Energy Procurement Program (REPP).
DNA Approval	This Project was not submitted to the DNA for approval previously.
Approval by other bodies	The Project has been approved by the local municipality, but no formal applications have been submitted to any higher levels of government.

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?

The project will make a positive contribution to national economic development in different ways: employment generation, foreign investment through start up capital funding and the sale of CERs, contributing additional electrical capacity to the national electricity grid to unlock local

development. Besides, the success of this project will encourage other investors to consider CDM opportunities in South Africa.

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

The project promotes sustainable society and increases the long-term sustainability of energy production by decreasing dependency on fossil fuels. This project will generate jobs and create opportunities to develop capacities for alternative and renewable energy generation. It will also advance society's thinking about mitigating climate change.

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

Please provide **brief** comment for each of these below.

The Project will positively affect all the relevant indicators provided for within environmental protection legislation, without any significant detriment to the ecosystem or biodiversity. In addition to the GHG reduction the project also helps in the national effort by removing the invasive biomass species from the land, the amount of water thus made available to indigenous species and to the water system and this will have a profound impact on the local flora and fauna.

i) That the **disturbance of ecosystems and loss of biological diversity** are avoided, or where they cannot be avoided, are minimised and remedied	Due to the increased availability of water due to the removal of Inavsive species the biological diversity will be increased. Some localized temporary disturbance of eco system, particularly in riparian zones, is possible during the extraction of the invasive. The harvesting team will be trained to minimize this impact.
ii) That **pollution and degradation of the environment** are avoided, or where they cannot be altogether avoided, are minimised and remedied	There is no pollution and degradation of the environment is associated with the project.
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 such impacts are envisaged. As mentioned above, there is a focus on the heritage aspects of the old coal fired power plant, now the focus for the renewable energy power plant.
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	Waste will be entirely avoided. The tars resulting from the combustion process will be carefully managed and disposed of in an environmentally responsible manner.
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	Water will be used as the primary energy carrier within the power generation plant this water will be condensed after the turbo generator stage and reused in the boiler for the steam production.
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.	The use of the Invasive Alien biomass is a long term process aimed at eradicating its existence.
vii) That **a risk averse and cautious approach** is applied, which takes into	Careful risk-averse planning and engineering is at the heart of

account the limits of current knowledge about the consequences of decisions and actions	the developmental approach for this project.
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	Any and all impacts on the environment and people's rights will be discussed and workshopped during the public stages of the EIA, and the findings incorporated into the developmental approach.
Other comments **Please provide any other comments on how this project contributes to sustainable development in South Africa (**optional)	

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)	• No net impact on local air quality • No net impact on local water pollution • No net impact on solid waste • Positive impact relating to improved water supply in the local areas.
	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	• No Impact • Very positive impact on the sustainability of water supply in the region. • No impact
	Impacts on biodiversity and ecosystems	• Changes in local or regional biodiversity arising from the project	• Improved local biodiversity arising from improved water availability in the environment.

Indicators in Support of the Project Approval Criteria			
Category		**Indicator**	**Comment**
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	• No Impact • There will be a positive impact on existing economic activity, since local development is constrained by power capacity limitations. • The project will have a positive impact on the cost of energy, over the medium and long term. The PPA will ensure that in the future the cost of this power is less than that at which the grid supplier (Eskom currently) will be able to supply it. • There will be a positive impact on foreign exchange, through sale of CERs.
	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	• There will be a positive impact on technology transfer into the country. • The project will have an impact on local skills development through dedicated up skill of personnel to operate the various project facilities. • The Project will serve as the first of its kind to run entirely on Invasive Alien Plants, and will hence demonstrate the possibility for the concept to be undertaken elsewhere in the country.

Indicators in Support of the Project Approval Criteria			
Category		**Indicator**	**Comment**
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)	• The project is clearly aligned with the government's commitment to renewable energy (10,000 GWh by 2013). It is also closely aligned with the Eastern Cape Province Renewable Energy Strategy currently under development. • The project has tremendous support from the Local Economic Development unit in Makana Municipality as it aligns so well with its developmental objectives. • The project will have an indirect effect on the provision of basic services in the area, since those areas under – serviced with electricity may become eligible for connection with additional capacity on the local grid. • There will be no impact on communities' relocation. • The project fits into the RE targets stated above, as well as the new targets being outlined during the revision of the RE white paper.
	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	• The project will create job opportunities for the life time of the project activity. The jobs will range from semi skilled harvesting job to operations management jobs. • The project will have no impacts on community social structure. • The project will have a positive impact on social heritage through the restoration of the old power station. • The project will have no impacts on social amenities. • The project will contribute indirectly in the development of previously underdeveloped areas by strengthening the grid power availability and the economic benefits to the local people along with the removal of unwanted IAP.

Indicators in Support of the Project Approval Criteria			
Category		**Indicator**	**Comment**
General	General Project Acceptability	• Are the distribution of project benefits deemed to be reasonable and fair?	• The project benefits are deemed to be reasonable and fair. The Local Community will receive good and long term jobs and the region will benefit from the opportunities that increase the electricity capacity on the local grid has to offer.

Part D: Finance

Project Costs	
Development Costs (ZAR)	ZAR 3,000,000
Installed Costs (ZAR)	ZAR 89,723,782
Other Costs (ZAR)	ZAR 10,000,000
Total Project Costs (ZAR)	ZAR 102,723,782
Sources of Finance	
Equity	Nollen Group
Debt (long term)	Still to be identified
Debt (short term)	Still to be identified
Amount not identified (R's)	Not Applicable
Total CDM Contribution sought	To Obtain a project internal rate of return to attract the investment will require in the order of R 33,492,360 per annum from CERs or sum of R334million over the life time of the project
Expected Price of CER in case of a contract to purchase for: A period of 7 years A period of 10 years A period of 14 years (2x7 years)	 € 12/t € 12/t € 12/t
Indicate the **projected Internal Rate of Return** for the project with and without CER revenues.	Project IRR With out CDM: 5.18% Project IRR With CDM: 7.13%
Constraints on tradability of carbon credits	None
Preliminary discussions with potential purchasers	Yes, PP has Signed term sheet with the CER Buyer – "Bunge Emission Holdings SARL"