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	Eastern Cape renewable energy for household project
Date of Submission of PDD	10 July 2013

Project Developer	
Name	Green Development AS
Organizational Category	*Private Company*
Legal Status	*Limited liability company (Ltd)*
Street Address	*TROSVIKODDEN 8,* *1392 VETTRE,* *NORWAY*
Postal Address (if different from above)	
Website Address	*www.greendevelopment.no*

Main Activities	*CDM Program developer and project developer. Company will implement projects that provide renewable energy or clean drinking water to households in order to generate carbon credits.*
Summary of Financial Performance in last fiscal year	*The company has 6 250 000 NOK in registered capital. (9.65 million Rand) In addition to this the company has received about 1 million NOK in grants and 500 000 in loans.* *The company has ability to raise further equity as needed.* *The company has no income and will get no income until 2014, when the first carbon credits are earned.*
Contact Person(s)	Havard Norstebo
Telephone	Work: +254 705323314 Cell: +254 705323314
Fax	
Email Address	hn@greendevelopment.no
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	Benefield
Nature of partner	*Project Implementation Partner*
Organizational Category	*Private Company*
Legal Status (if private company)	*limited partnership*
Street Address	2A, 8th Street Parkhurst Johannesburg 2193
Postal Address (if different to Street Address)	
Website Address	www.benefield.co.za
Main Activities	The reduction of energy/electricity use by companies and individuals. Green energy/solar energy
Contact Person(s)	Clinton Long
Telephone	Work: 011 4476881 Cell: 0711830305

Fax	0865817597
Email Address	Clinton@potentialenergy.co.za
Contractual Arrangements	
Contractual arrangements between various entities involved	*Green Development will be responsible for all CME related activities for the CERs to be issues. Green Development will retain the ownerships of all the carbon credits. Green development will provide financial assistance equal to between $10 and $20 for each household included in the project and which we earn carbon credits from. This financial assistance will be given each year and will be paid out to the project implementation partner.*

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

Technical Summary of the project	
Objective of the Project	Replace non-renewable fuel for cooking with solutions based on efficient and renewable solutions.

1. Replace to use of wood and charcoal for cooking, with locally and sustainably produced ethanol as cooking fuel.
2. Replace the use of wood and charcoal with locally and sustainably produced biogas as cooking fuel.
3. Provide purified water to households as an alternative to using wood and charcoal as fuel for boiling water.

The project will initially be implemented in small scale with about 1000 households and will gradually grow to include a maximum of 30 000 households. The initial 1000 households is expected to be included in the project in January 2014 and the number of project participating households is expected to reach 30 000 by January 2016.

Project Constraints
Availability of locally available biogas is a constraint. Biogas cannot be transported over large distances.

Technology to be employed	Purified water, biogas stoves and ethanol stoves are all well known technologies that is available in South Africa today, but the lack of financing is preventing these solutions to be deployed to its full potential. The income from the carbon credits will overcome this

Technical Summary of the project	
	challenge. These are the only technologies that will be employed directly by the project. Indirectly the project will support the local production of renewable biogas and ethanol to be used by the project participating households.
Greenhouse Gases Targeted	Co2
Emission reductions	The project expects to achieve a C02 reduction equal to 5 ton of C02 annually from each project participating household. With 1000 project participating households in 2014, the project will hence reduce Co2 emission by 5 000 ton in 2014. The annual emission reduction will increase to 150 000 ton Co2 annually from 2016, when 30 000 households will be included in the project. Total emission reduction over the first 7 years crediting period will be 1 000 000 ton.
Baseline & Additionality Assessment	The baseline scenario is identified based on the following sources; a) Baseline survey • ηold (Efficiency of the stoves used in the baseline scenario). • Cp (Fraction of woody biomass used in the form of charcoal). b) Default values from the methodology • $EF_{projected\_fossilfuel}$ • $NCV_{biomass}$ (Energy content of wood) • LF (Leakage factor) c) IPCC default values • $NCV_{ethanol}$ (Energy content of ethanol) • NCV_{biogas} (Energy content of biogas) d) Independent 3rd party reports • $fNRB_{,y}$ (portion of woody biomass which is non-renewable) • WBLB (how much wood is needed to boil a liter of water) • $WBLBC_{,Charcoal}$ (How much charcoal is needed to boil water) • $NCV_{Charcoal}$ (Energy content in Charcoal) • CCF (volume of wood is needed to produce a kg of charcoal)

Technical Summary of the project	
Monitoring	Monitoring will be done annually. Monitoring will be done by measuring the emission reductions achieved by a number of randomly selected project participating households.
Type of project/activities	Renewable energy
a. Energy Supply	Renewable energy for cooking at household level.
b. Energy Demand	
c. Industrial Process	
d. Transport	
e. Waste Management	
f. Forestry/ land use	
g. Other	
Project Boundary • Geographically boundary: The Eastern Cape Province. • Household boundary. Emission reductions are limited to emission reductions within each of the project participating households. • Emission reduction achieved from reduced usage of non-renewable woody biomass.	
Indicate Emissions outside the Project Boundary	There will be not be any measurable emission from the project activity outside the project boundary. To be conservative it is however considered emission leakage equal to 5% of project emission reductions.

Location of the Project	
Province	Eastern Cape
Municipality	Chalumna
Nearest city/large town	East London
Brief description of the location of the project site	Rural Farming Community

Project Schedule/Timetable	
Earliest Project Start Date	January 2014
When is the expected first year	

Project Schedule/Timetable	
of CER delivery	2015
Project Lifetime	21 Years
Project End Date	January 2035
Crediting Period	3 x 7 years.
Current Status or phase of the project	Under planning. Suppliers and local implementation partners have been identified.
DNA Approval	This project has not previously been submitted for approval.
Approval by other bodies	This project has not been submitted for approval to any other national, provincial or local government departments or agencies for regulatory or legal approval. The CDM PoA has however been approved by DNA in 9 other African countries.

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?

Please give details (1 paragraph)

Yes, the project will contribute to national economic development. Local agricultural waste is transformed into renewable energy in the form of biogas or ethaol. Reduced dependance on imported fuel and creation of local jobs related to project. See enclosed document – Value of Program.

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

Yes, the project will contribute considerably towards social development. Improved health as a result of less smoke indoors. Women will save 2 hours a day drom cooking and cleaning. Local jobs will be created. For more details see the enclosed document "Value of Program"

3. Environmental: Does the project conform to the National Environmental Management Act principles of sustainable development? Yes, the project will conform the National Environmental Management Act principles of sustainable development. Moreover the project will contribute to improved environment and to reduction of environmental degreagation of the East cape.	
i) That the **disturbance of ecosystems and loss of biological diversity** are avoided, or where they cannot be avoided, are minimised and remedied	The project will not provide any disturbance and loss of biological diversity. The project will contribute to saving the biological diversity by contribute to reduce deforestation.
ii) That **pollution and degradation of the environment** are avoided, or where they cannot be altogether avoided, are minimised and remedied	The project will not contribute to pollution or degradation of the environment.
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	The project will not contribute to the disturbance of landscapes and sites that constitute the nation's cultural heritage
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	The project will not produce any waste. The project will reduce problems related to waste, as the project will utelize locally available agricultural waste for the production of renewable energy.
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	The project will not use any non-renewable resources.
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 project will not contribute to the depletion of any resources.
vii) That **a risk averse and cautious approach** is applied, which takes into account the limits of current knowledge	A risk averse an cautions aproach is applied to reduce the risk of any potential negative impact of the project

about the consequences of decisions and actions	to the environment or society.
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	There are no negative impact on the environment or on peoples environmental rights.
Other comments **Please provide any other comments on how this project contributes to sustainable development in South Africa (**optional) The project will contribute to reduced deforestation and hence from erosion. The project will also contribute to employment and to reduce health cost due to improved indoor smoke (indoor smoke from solid fuel kill 4 million people annually).	

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)	Please comment on the impact of the project on local environmental quality. Comment specifically on the indicators of relevance which are given here. (1 paragraph) There will be no negative impact on the local environment. The project will however have substantial positive environmental impact in the form of reduced pollution from burning solid fuel and from reduced deforestation. The project will also contributing to reducing problem associated with solid waste as the program will contribute to converting solid waste into renewable energy in the form of biogas or ethanol
	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	Please comment on the impact of the project on the usage of natural resources. Comment specifically on the indicators of relevance which are given here. (1 paragraph) The project will have no negative impact on the useage of natural resources. The project will however have a positive impact in that it will reduce the use of non-renewable wood and hecne reduce the rate of deforestation.
	Impacts on biodiversity and ecosystems	• Changes in local or regional biodiversity arising from the project	Please comment on the impact of the project on biodiversity and ecosystems. Comment specifically on the indicators of relevance which are given here. (1 paragraph) The project will have no negative impact on biodiversity or the ecosystem. Positive effect on biodiversity and the ecosystem might achieved by reducing deforestation and problems associated with erosion.

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	Please comment on the economic impacts of the project. Comment specifically on the indicators of relevance which are given here. (1 paragraph) The project will reduce the demand for imported fuel such as LPG or kerosene or charcoal. The project will create economic growth by providing additional income to local farmers that can sell their waste that can be converted into ethanol or biogas. The project will also reduce the cost of cooking fuel for households and ethanol and biogas will be cheaper than all alternative fuels (maybe with the exception of fuel wood).

Indicators in Support of the Project Approval Criteria			
Category		**Indicator**	**Comment**
	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	Please comment on the impacts of the project on appropriate technology transfer. Comment specifically on the indicators of relevance which are given here. (1 paragraph) There is limited impact on transfer of technology with this project. The deployed technology will primarily be provided by existing suppliers in South Africa, and the CDM Program will simply contribute to making these solutions more economically justifiable. The project has an exceptional potential for replication and it is the goal of Green Development that the financial contribution from the CDM Program will enable project partners to expand the program to enable a million households in South Africa to be able to use locally produced sustainable and renewable energy for cooking as part of the program.

Indicators in Support of the Project Approval Criteria		
Category	**Indicator**	**Comment**

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)	Please comment on how the project is aligned with national, provincial and local development priorities. Comment specifically the indicators of relevance to the project which are given here. (1 paragraph) The project will contribute towards the goal of reduced pollution, increased reliance of clean and renewable energy and will provide increased access of basic services such as access to clean drinking water. The project will provide renewable energy to 30 000 households and with substantial further potential for replication.
	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	Please comment on the impact of the project on social equity and poverty alleviation. Comment specifically on the indicators of relevance which are given here. (1 paragraph) According to a substantial report developed by the World Bank, one net additional job will be created for every 20 household included in the program. The program will contribute social equity and poverty alleviation as the project is primarily targeted to those that use wood and charcoal for cooking. Households that use LPG or electricity for cooking is unlikely to switch to biogas or ethanol and such households will not have need for water purification solutions. Hence the project will primarily contribute to improvement of the lives of the poorer portions of the populations and the project will improve the lives of these households as they will get access to better and cheaper fuel for cooking.

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?	Please comment on whether the benefits occurring from the project due to the contribution of the CDM are reasonable and fair. (1 paragraph) The distribution of the project benefits is deemed to be reasonable and fair. Most of the income from the carbon credits will be paid out local project implementation partners (a minimum of $10 per year per household). The greatest benefit of the project will be the environment, secondarily the benefit will be the health and economic gain from households. The financial befits to the project implementation parties will be relatively minor compared to the benefits to households and to the environment.

Part D: Finance

Project Costs	
Development Costs (R's)	CDM development cost is shared between many projects in many African countries and will hence not be paid by the proposed project.
Installed Costs (R's)	About 1000 Rand per households to be included in the project.
Other Costs (R's)	About 100 Rand per household
Total Project Costs (R's)	About 1100 Rand per household to be included in the project. For 30 000 households this will be a total project cost of 33 million Rand. It must, however, be made clear that such project cost does not have to be provided as available capital as the project will grow organically which will reduce upfront capital requirement.
Sources of Finance	
Equity	*Project implementation will provide limited equity, but rather sell the deployed equipment to end users, and the revenue from this equipment will be used to buy more equipment that will then be sold to new households. Hence the program will grow organically as new households are included in the program. The total project will hence not need to be financed upfront.*
Debt (long term)	*The Norwegian government through the Norwegian Export credit agency will provide funding for up to 80% of equipment cost. This debt will be paid back over 5 years, and will be secured with the future income from carbon credits.*
Debt (short term)	No short term debt financing will be used.
Amount not identified (R's)	*Initially the project will start with 1000 households. This will require about 1 million Rand in capital. Part of this will be provided by CSR funding and part by equity by project implementation parties as well as debt financing.*
Total CDM Contribution sought	*The project will not require any public funding support. The income from the carbon credits will secure access to debt funding equal to 80% of total cost of deployed equipment.*
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)	*Expected price for CERs is 100 Rand. This is based on the South African proposal that companies can buy CERs from projects in South African and offset these against carbon taxes after 2015.*
Indicate the **projected Internal Rate of Return** for the project with and without CER revenues.	Not applicable . The project would not be financially sustainable without income from carbon credits.

Constraints on tradability of carbon credits	*No constraint on tradability of carbon credits has been made. It has been proposed that loans can be obtained from the Norwegian Export Credit agency that loans can be provided against security in future income from carbon credits. Such a scheme would imply some constraint on the use of the carbon credits generated.*
Preliminary discussions with potential purchasers	*No discussion has been or will be made with potential buyers of the carbon credits as it is expected that the carbon credits will be bought by local companies to offset carbon tax liabilities.*