

PROJECT INFORMATION DOCUMENT (PID) CONCEPT STAGE

Report No.: PIDC18286

Project Name	Promoting Biogas as Sustainable Clean Cooking Fuel for Rural Households in Kenya (P153493)
Region	AFRICA
Country	Kenya
Sector(s)	Other Renewable Energy (100%)
Theme(s)	Climate change (100%)
Project ID	P153493
Borrower(s)	SimGas IP BV
Implementing Agency	SimGas East Africa
Environmental Category	B-Partial Assessment
Date PID Prepared/ Updated	16-Jun-2015
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Estimated Date of Board Approval	09-Nov-2015

I. Introduction and Context

Country Context

Kenya, a lower middle income country (MIC) with per capita Gross National Income (GNI) of US\$ 1,160 in 2013, has a population of nearly 40 million people dispersed across 47 counties with significant regional disparities in economic growth and poverty reduction which pose significant development challenges. Kenya holds great potential from this growing and youthful population; its dynamic private sector; a platform for change laid down by the new Constitution; and its pivotal role within East Africa and beyond. From 2006 to 2013, annual growth rates averaged 5.0 percent. Kenya's high unemployment, poverty and inequality rates have dampened its new status as a MIC even though the data are outdated and precise levels are unknown. The rate of poverty reduction has not kept pace with economic growth. Poverty rate is estimated to have reduced to 38 percent in 2012 from 46 percent in 2005/6. Inactivity rates among the youth stand at 9.6 percent compared to national average of 8.5 percent. Inequality stands at 47.7 percent. Infrequently collected and disseminated statistics are not conducive to inform and shape economic policy. Governance concerns persist; and growth has been constrained by low investment and low firm-level productivity and has yet to take off at the rapid, sustained rates needed to transform the lives of ordinary citizens. There are significant differences in opportunities and outcomes between women and men and for those living in the remote and most underdeveloped regions.

“Vision 2030”, a national long-term development strategy, aims to create a globally competitive and

prosperous nation with a high quality of life by 2030, that aims to transform Kenya into a newly industrializing, middle-income country providing a high quality of life to all its citizens by 2030 in a clean and secure environment. Vision 2030 calls for the rehabilitation and upgrading of the road network, upgrading the railways, improving urban public transport and expanding access to electricity and clean and safe water. The Government is currently implementing the first phase of the plan, covering the period 2013-2017 through its Medium Term Plan (MTP).

Sectoral and Institutional Context

More than 75% of the Kenyan population live in the rural areas, with agriculture as their main occupation. The main farming systems feature cash crops, food crops, fruits and vegetables, forages, livestock, and tree growing. Energy plays a significant role in the lives of the smallholder farmers. They need energy for cooking, lighting, warming and drying (KARI, 2003). Fuel wood is the principal farm-based source of energy but is often in short supply. Biomass accounts for 68% of the total energy consumption (90% of the rural population is dependent on firewood), followed by petroleum with 22%, electricity 9% and others with 1%.

Kenya's current effective installed electricity capacity is 1,429 MW, and electricity access is currently at 15% and the government plans to increase connectivity to at least 65% by the year 2022. It is estimated that more than half of the electricity supply is produced by hydroelectric dams, with the rest coming from fossil fuel thermal power plants and geothermal utilities. Some installed small-scale renewable utilities also contribute to the grid. The current per capita electricity energy consumption of about 121 kWh per year is expected to grow as the country gears up for accelerated growth. This has prompted the government to build new coal power plants and also commission a 1000MW nuclear power plant in the next 7 to 10 years or so. All these, plus the new discoveries of promising oil reserves could have a significant impact on energy policies, bioenergy development and the future of energy mix in Kenya. There is still further potential for a higher contribution or improvement of renewable energy in Kenya with respect to energy efficiency, sustainable exploitation, impacts on the environment and people's health. Among these renewable energy sources is biogas which is mainly used at the domestic level where over 4,500 domestic size units have been installed over the past two years, averaging from 3-15 m³. Overall, there are several thousand biodigesters installed in Kenya, but, most of them operate below capacity or are currently in disuse due to management, technical, socio-cultural or economic problems.

The project would target a number of development challenges, including providing access to clean, renewable off-grid energy; combating deforestation and providing climate change mitigation benefits; improving livelihoods; empowerment of women and children and improved health from reduced indoor smoke exposure. These are all supporting the World Bank Group's twin goals of eradicating extreme poverty and boosting shared prosperity.

Relationship to CAS

According to the latest CPS for Kenya (FY 2014-2018), the WBG will ramp up its already considerable support to public-private partnerships, especially in the energy, water, and transport sectors. Another high priority is to target support for the poor including focus on agriculture -- a direct link with helping families in rural areas. The poor must also be protected from the impact of disasters and climate-related changes to their environments, as climate variability and hydro-climatic shocks (droughts and floods) impact disproportionately on the poor. The proposed project, by providing cooking energy from manure, would enhance energy security at household level, while

slurry from the biodigesters can enhance agricultural productivity. The monetary savings from free biogas can buffer against food price shocks.

II. Proposed Development Objective(s)

Proposed Development Objective(s)

Reduction of GHG emissions from improved access to biogas energy as a clean cooking fuel in livestock-owning rural households in Kenya.

Key Results

The key PDO level indicators are listed below:

1. Cumulative GHG reductions achieved
2. Number of households benefiting from access to biogas energy for cooking
3. Direct project beneficiaries, out of which XX women

III. Preliminary Description

Concept Description

The project's objective would be to promote the use of biogas as clean cooking fuel in livestock-owning rural households in selected parts of Kenya. The program has set up hub offices in Nakuru, Eldoret and Karatina to be possibly followed by Central, North and South Rift areas. Hub offices serve an area with a radius of 50 km. These distribution points are selected close to dairy farmers, which are a main target group. Thus, the biodigesters will be made available to households in a coordinated fashion to ensure there is access to maintenance hubs within 50 km of the installation location.

With a funding amount of US\$7.0 million, the project proposes to reach out to about 6,000-8,000 HHs every year between 2015 and 2024. The project would have multiple development benefits resulting from substitution of firewood for cooking by clean biogas. These multiple benefits would include reduced forest degradation and desertification, improved indoor air quality (from reduced indoor smoke exposure), improved health and reduced hardship for women and children who are primarily engaged in the collection of firewood in rural areas, increased income and social welfare improvement for rural HHs, creation of small scale business enterprises, along with contribution to climate change mitigation.

The proposed project is part of the National Biogas Promotion Program KENDBIP (Kenyan Domestic Biogas Programme), which in turn is part of the larger Africa Biogas Partnership Programme (ABPP). ABPP has a target of 100,000 systems installed in Ethiopia, Kenya, Tanzania, Uganda, and Burkina Faso and providing half a million people access to a sustainable source of energy by the year 2017. The KENDBIP program was initiated in Kenya in 2009 with an overall goal of developing a commercially viable biogas sector in Kenya. Since 2009 to 2013 the program has managed to install over 11,000 biogas plants of the traditional brick-laid design. The second phase of the program runs from 2014 to 2017 with a target of installing 27,500 digesters of both traditional and advanced innovative designs, such as the one promoted by this proposed program.

Biogas systems convert manure and/or organic household waste into methane gas. This gas can be directly used for cooking. The technology is well-known in Sub-Saharan Africa and Asia, but traditional brick-laid designs are challenging for large scale implementation. Initially, two types of biogas systems—the float-drum type and the fixed dome type have been promoted. Although these systems have been successful elsewhere, adoption in Kenya has been minimal because of expensive

installation costs. SimGas, a private company, has pioneered a new and innovative design for a biogas system unlike the traditional designs implemented elsewhere in Africa and the developing world. Unlike traditional biogas systems targeting households, the SimGas system is an innovative in design, is easy to install and can be mass produced to meet the consumer demand quickly. Also, the system is made of recycled molded plastic that makes it affordable to users which should also allow for a longer operating life than traditional brick laid designs. SimGas has developed two proprietary designs of biogas systems: GesiShamba and GesiSafi. GesiShamba is for rural households and GesiSafi for urban users. The rural Gesi Shamba system is modular and scalable in 1m3 segments from the minimum size of 2m3 even after installation, should the need or opportunity to produce more biogas arise in a household.

SimGas is the Coordinating/Managing Entity (C/ME), which has developed the Clean Development Mechanism (CDM) Program of Activities (PoA) “SimGas Biogas Programme of Activities”, registered under the UNFCCC on December 21, 2012. The first CDM Project Activity (CPA) covering 4,000 rural digesters and 6,000 urban digesters is already being implemented. Additional CPAs would be included in the PoA once all digesters under the first CPA have been installed. The project is already generating emission reductions from the biodigesters installed after the registration of the PoA

Through a carbon finance transaction, the World Bank as Trustee of the Carbon Initiative for Development (Ci-Dev) intends to purchase carbon credits (Certified Emission Reductions, CERs) from the CME which are generated by individual households’ biogas units under the CDM-PoA. Carbon payments allow SimGas to sell biogas systems at a discount to consumers and offer a warranty during the lifetime of the CDM PoA, supporting the expansion of access to biogas energy in rural Kenya

IV. Safeguard Policies that might apply

Safeguard Policies Triggered by the Project	Yes	No	TBD
Environmental Assessment OP/BP 4.01	x		
Natural Habitats OP/BP 4.04		x	
Forests OP/BP 4.36		x	
Pest Management OP 4.09		x	
Physical Cultural Resources OP/BP 4.11		x	
Indigenous Peoples OP/BP 4.10		x	
Involuntary Resettlement OP/BP 4.12		x	
Safety of Dams OP/BP 4.37		x	
Projects on International Waterways OP/BP 7.50		x	
Projects in Disputed Areas OP/BP 7.60		x	

V. Financing (in USD Million)

Total Project Cost:	7.00	Total Bank Financing:	0.00
Financing Gap:	0.00		
Financing Source			Amount

Borrower	0.00
Carbon Fund	7.00
Total	7.00

VI. Contact point

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