

**PROJECT INFORMATION DOCUMENT (PID)  
IDENTIFICATION/CONCEPT STAGE**

Report No.: PIDC17014

<b>Project Name</b>	Uganda Clean Cooking Supply Chain Expansion Project
<b>Region</b>	AFRICA
<b>Country</b>	Uganda
<b>Sector(s)</b>	Forestry (10%), Health (30%), General energy sector (60%)
<b>Theme(s)</b>	Other rural development (20%), Pollution management and environmental health (20%), Injuries and non-communicable diseases (20%), Other Private Sector Development (20%), Urban Economic Development (20%)
<b>Lending Instrument</b>	Lending Instrument
<b>Project ID</b>	P153679
<b>Borrower Name</b>	Ministry of Finance, Planning and Economic Development (MoFPED)
<b>Implementing Agency</b>	Ministry of Energy and Mineral Development, Private Sector Foundation Uganda (PSFU)
<b>Environment Category</b>	C - Not Required
<b>Date PID Prepared</b>	09-Jul-2015
<b>Estimated Date of Approval</b>	21-Sep-2015
<b>Initiation Note Review Decision</b>	The review did authorize the preparation to continue

**I. Introduction and Context**

**Country Context**

1. About 95% of Ugandans still use solid biomass fuels for cooking and although 12% have access to electricity, the majority of electrified households continue to use wood and charcoal. About 73% of the population uses firewood while 23% uses charcoal as their primary cooking fuel. The use of modern fuels such as Liquefied Petroleum Gas (LPG) is very low at 0.5 – 1% and is expected to remain at this level in the short to medium-term. Biomass fuels have become increasingly expensive due to the escalating pressure on biomass resources. As a result, the share of household expenditures for solid cooking fuels in Uganda is one of the highest across Sub-Saharan Africa (SSA). While the country’s lowest quintile spends an average of 9% of household income on woodfuels, the highest quintile expends about 15% on cooking fuels, mostly as a result of already high and further increasing charcoal prices.

2. Uganda’s population growth has put considerable pressure on natural resources, especially on forest resources. At present, the country has the second highest birth rate in the world with a Population Growth Rate (CAGR) of 3.2%, further increasing the demand for natural resources especially in and around the largest cities. Pressure on forests in Uganda is mainly driven by forest clearings for agriculture and settlements and the escalating demand for woodfuels. From 2000-2010, Uganda had the fifth highest deforestation rate in SSA, with an average rate of

deforestation of 2.46% during this period.

3. Exposure to household air pollution (HAP) in Uganda is estimated to significantly impact the health of over 20 million people and cause over 13,000 deaths every year. About 3.8 million households cook on open fires in enclosed spaces and nearly 1 million additional households are exposed to carbon monoxide from traditional charcoal stoves. HAP is responsible for 8.2% of infant deaths due to acute lower respiratory infections (ALRI). Concentrations of indoor respirable pollutants have been found to be extremely high in households included in a study carried out in three divisions of Kampala District.

4. The Government of Uganda (GoU) acknowledges the biomass energy issue as an important development challenge and is taking steps to address it via a joint coordination framework. The “Uganda Renewable Energy Policy Objectives and Strategies” document broadly emphasized “utilizing biomass energy efficiently so as to contribute to the management of the resource in a sustainable manner” and more specifically “scaling-up the adoption of efficient charcoal fuel stoves from 20,000 currently to 2,500,000 households by 2017 and increase the adoption of efficient fuelwood stoves from 170,000 currently to 4,000,000 by 2017.”

5. The adverse impacts of household air pollution on health are noted in Uganda’s National Biomass Energy Demand Strategy including a specific objective to "sensitize women on energy source and technology choices in order to reduce the labor and health burdens associated with biomass energy use."

6. The GoU is currently strengthening the inter-ministerial dialogue for the sector by developing a national Biomass Energy Strategy (BEST). BEST is a joint coordination framework for the Ministries of Health, Housing, Environment and Energy on the development and implementation of national policies and regulations for the clean cooking solutions. Increasing use of efficient biomass energy technologies is also envisaged. Moreover, the Ministry of Water & Environment and the National Forestry Authority are currently undertaking work in improving the sustainability of charcoal production in an attempt to address the supply side issues of biomass.

### **Sectoral and Institutional Context**

7. The rate of improved cookstove adoption nationally has remained low. Despite the GoU’s efforts, high potential demand for clean cookstoves, and a plethora of government and donor interventions, the adoption of improved cookstoves has remained far below 10%. However, with a large and growing number of consumers having the ability to pay for improved cookstoves, and 36% of rural households spending a significant and growing share of their monthly incomes on fuelwood, the economic case for efficient cookstoves is stronger than ever before. Based on recent analysis, Uganda’s potential market for improved cookstoves is more than 4.5 million households in rural areas plus another 1.5 million in the urban centers.

8. While Uganda has more than 50 cookstove producers, most are producing no more than 100 units per month, and only a handful have potential for mass production. Apart from a lack of technology transfer and centralized manufacturing facilities, the status quo is also a result of the patchy integration of domestic production into local supply chains. While past sector strategies and resources have been focused on creating supply-push through the scaling of cookstove production volume, the rest of the supply chain has not grown accordingly and lacking distribution networks

are constraining further market growth. Most importantly, with stove distribution being limited to a few poorly capitalized distributors, cookstove manufacturers have to shoulder the entire burden of inventory financing and working capital need on behalf of their sales intermediaries. Consequently, the production sector is suffering from continuously eroding margins and lacking resources for reinvestment in production capacity. This impedes manufacturers to build the economies of scale and product innovation needed to remain competitive and meet evolving consumer demand.

9. The weak supply chain limits the exposure of consumers to more advanced and attractive state-of-the-art technology, chokes demand growth, and ultimately leads to market spoilage. With lacking point-of-sale feedback from a sufficiently broad network of commercial distributors, manufacturers find themselves “in the dark” with insufficient sales data and market intelligence on consumer preferences and willingness to pay to make informed investment decisions. Moreover, with “traditional” stove support continuing to support an aggressive supply-push of locally manufactured products through non-commercial channels such as subsidized distribution by (mission-driven) NGOs and the manufacturers themselves, negative effects such as market spoilage and oversupply are becoming increasingly prevalent.

10. Supply and manufacturing capacity lag far behind the magnitude of the public health challenge: With over 20 million people impacted by HAP-related pollution and market penetration of clean stoves stagnating far below achievable target levels, the urgency of the health issue suggests the need for a far-reaching readjustment of policies and incentives in the sector. Given the current number and capacity of stove manufacturers, reaching the GoU’s above goals would require (i) a more than 100-fold scale-up in the adoption of cleaner and more efficient stoves in combination with (ii) significant upgrading of both quality and performance of stoves currently on the market.

11. Even with a radical scale-up of support for domestic manufacturing, it is highly unlikely that Ugandan cookstove producers alone will be able to reach the necessary scale within the required (2-3 year) timeframe. Even more so, since manufacturers simultaneously have to catch up with international manufacturers to reach the required stove performance standards in terms of durability, efficiency and the “aspirational appeal” needed to drive consumer demand.

12. Supply-side transformation - need to foster centralized production and technology transfer through local assembly: Significant investments are needed to design and manufacture clean cooking technology, including robust production processes to ensure consistent quality control and performance. This is particularly important given the GoU’s focus on health benefits: In order to deliver reductions of household air pollution at scale, centralized manufacturing models will be prerequisite to securing the needed minimum quality and performance. Consequently, the most suitable way to reach economies of scale is to provide targeted assistance to a limited number of larger, more established manufacturers and foster technology transfer through partnerships between Ugandan and international industry leaders, rather than to extend more generic support to a large number of local artisans. Within this context, local assembly of imported high quality stove components can be a powerful catalyst for speeding up technology transfer: Many of the best stoves available globally can be imported “flat-packed”, thus enabling high local labor content for their assembly, and increased local component production over time, once demand is established at critical minimum levels.

13. Insufficient demand to trigger needed sales growth and momentum: National stakeholder

consultations and recent market survey commissioned by the Bank revealed persistent lack of awareness among consumers of the many benefits of clean stoves and fuels. While significant analytic efforts have been undertaken to better understand and influence consumer behavior, past public awareness campaigns were underfunded and poorly coordinated with actual stove availability. Moreover, instead of supporting the commercial marketing of aspirational stove products, awareness raising efforts were overly focused on the important, yet abstract advantages of clean cooking solutions including their health and environmental benefits. A plethora of market research shows that this strategy is clearly at odds with consumer perceptions: households typically attribute much greater value to monetary savings from reduced fuel use and to the ease of use and aspirational appeal of modern cookstoves. As a result, even though overall consumer awareness has grown somewhat, past engagement efforts have not triggered additional sales, and willingness to pay for stoves that really would save time, money and improve health outcomes, remained largely unchanged.

14. Sustainable demand-side transformation - Boosting demand through commercial sales campaigns, instead of “buying temporary behavior change” through subsidies: A recent survey of Ugandan households and extensive experience with the Bank’s recent “Lighting Africa” project, show that to create an effective product experience and boost sales, trial periods and direct marketing are often far better tools than subsidized prices and donor-led awareness building. Study results in Uganda show that a free stove trial followed by a rent-to-own offer increased uptake by between 45% and 57% compared to a traditional cash and carry sale. When consumers in Kenya were left with a solar lamp for five days, their willingness to pay for the product increased by up to five times, indicating that customers need to build a personal level of trust with the product before committing financially. The beneficial effect of such trial periods is particularly strong with poor populations who are often especially suspicious of advertising and prefer to rely on their own direct experience of new products. However, within the Ugandan context, large free-trial campaigns, generating direct exposure at sufficient levels, represent a prohibitive cost and risk to the large majority of poorly capitalized distributors. Moreover, a sufficiently powerful market-pull through commercial sales can only be achieved if taxes and duties on imported components allow so. Otherwise, local assemblers and manufacturers of high quality stoves will not be able to produce and import stoves and components at competitive cost, and demand will continue to stagnate.

15. Missing supply chain linkages hampering the reconciliation of supply and demand: Results from the abovementioned survey show that patchy supply chains and costly distribution logistics remain the key barriers for the Uganda market for high quality, high benefit cookstoves to reach scale. Inefficient supply chains limit growth by hampering the efficient matching of supply and demand and imposing narrow limits to the access of customers to stove products in the first place, thereby making awareness raising efforts virtually pointless. Moreover, due to the lack of suitable distribution channels and sufficiently capitalized intermediaries, stove manufacturers and importers have to bear the entire cost burden of making their products available locally. As a result, consumer prices for advanced cookstoves are bound to remain high, with producers having neither the resources nor the incentives to further stimulate demand or grow production.

16. Supply chain integration - relieving local assemblers and manufacturers of the working capital burden: Successful large-scale stove distribution models are always unique in their respective market segments, with the cost of their development and scale-up “from the ground up” often far exceeding the resources of individual manufacturers. More specifically, building efficient sales channels require jump-starting demand and distribution simultaneously to achieve the

minimum sales volumes necessary to support the cost of inventories, working capital and the aggressive marketing of products new to consumers. Consequently, helping undercapitalized Ugandan distributors take on working capital risk, will immediately free up resources for investment in marketing and delivery channels, and for enhancing product quality and innovation.

#### **Relationship to CAS/CPS/CPF**

17. The proposed additional financing is well aligned with the Uganda Country Assistance Strategy for 2010-2015. Among other essential challenges identified, “Arresting environmental degradation and natural resource depletion” has been identified in the CAS as a key development issue. The document acknowledges that despite efforts to improve institutions for environmental management and sustainable use of natural resources, the depletion of Uganda's natural resources and degradation of the environment is constraining growth. The document also recognizes that “there is a high level of deforestation and forest degradation in Uganda while household expenditures for these fuels that are the principal sources of energy have doubled during the last 15 years.”

## **II. Project Development Objective(s)**

### **Proposed Development Objective(s)**

17. The Project Development Objective is to expand both access to and adoption of cleaner and more efficient cooking technologies.

### **Key Results**

- (i) Increase market penetration of improved cookstoves that meet the minimum performance standards as defined by MEMD (incremental sales of stove models supported under the project) by at least 100,000 households;
- (ii) Increase market penetration of advanced cookstoves that meet ISO International Workshop Agreement (IWA) Tier 3 for indoor emissions of CO and PM2.5 (incremental sales of stove models supported under the project) by 15% of the total target;
- (iii) Reduce household expenditure for cooking fuels (USD/household/month for sampled households in comparison with control group) of verified incremental stove buyers by an average of at least 20%.
- (iv) Reduce climate impact of household emissions resulting from the inefficient use of biomass (tons of GHG and black carbon emissions/household/month for sampled households in comparison with control group) by at least 30%.

## **III. Preliminary Description**

### **Concept Description**

20. With its focus on commercial distribution at scale, the proposed approach is moving away from the mainstream of clean stove interventions. Through its distinctive design, the project will not “buy temporary behavior change” through subsidies, nor make top-down prescriptions of a certain product or technology. Instead, the project will help the GoU define minimum stove performance levels and a roadmap for their adoption as a direct function of the government’s health, social and environmental objectives for the cooking sector. Then, by incentivizing distributors to progressively make different tiers of suitable cleaner and more efficient stoves available, the project leaves the

decision of (local vs. imported) product and component sourcing to the sales intermediaries, and the final product choice to the consumer.

21. Through the “catalytic” design of the intervention, market growth will be driven by the creation of an even and competitive playing field between project beneficiaries, and by freeing up manufacturers’ and distributors’ resources for investment in building economies of scale and efficient distribution channels. Therefore, compared to the “traditional approach” of providing direct subsidies, sales are expected to grow and prices are expected to drop more drastically and sustainably.

22. An earlier initiative with a similar project focus and design was developed in 2013 as additional financing to the second phase of the Energy for Rural Transformation WB lending project (ERT2). However, due to a disproportionately short remaining implementation time frame imposed by the funding source, Bank management had to cancel the project at the post-appraisal stage and encouraged the task team leader to identify a more suitable source of long-term funding.

#### A. Description

23. The proposed project will focus on: (i) building and expanding the distribution supply chain for qualified stoves, (ii) facilitating the integration of the stove supply chain through “matchmaking” between manufacturers and distributors, (iii) developing and field testing high-impact marketing and consumer finance schemes; and (iv) the roll-out of a rigorous quality assurance and technical support program in support of manufacturers.

24. Component 0 – Project Preparation: This component will comprise 2 activities, namely (i) the collection of baseline data on cook stove availability and adoption, performance, household spending on cooking fuels, as well as household pollution including GHG and black carbon to provide a sufficiently robust basis for measuring the above results indicators; (ii) Willingness to Pay (WTP) and Consumer Acceptance (CA) trial of shortlisted products that will potentially become eligible under the program (see Annex 3 in the doc version of the PCN); and (iii) the development of synergistic partnerships in the form of joint ventures or consortia of manufacturers, distributors and retailers. This “matchmaking support” will entail: (a) mapping of distribution chains and identification of strategic players positioned well in the market through distribution of other household products, and (b) facilitating market linkages among these different supply chain actors and with consumer groups, cooperatives and institutions. Both preparatory activities will be implemented and funded through the Bank’s ongoing Africa Clean Cooking Energy Solutions (ACCES) umbrella project.

25. Component 1 – “Distribution Challenge Fund (DCF)”: Under this component, the Private Sector Foundation Uganda (PSFU) will provide working capital and transaction cost support in the form of competitive grants to help both existing and new commercial distributors expand distribution supply chain of improved cookstoves eligible under the program, carry out high-impact marketing and sales campaigns (including user-trials for selected products), build partnerships with international manufacturers and leverage further growth finance from financial intermediaries. The competitive grants and incentives will reduce working capital cost and risk for manufacturers, including stove importers and local assemblers of internationally sourced components. This will boost market penetration and free up manufacturers’ resources to expand and upgrade their production capacity. The grant support will only be available to distributors of approved stove models that comply with

minimum performance levels to be determined by MEMD. The exact structure of the grant mechanisms, including eligibility criteria of beneficiaries, will be developed in close cooperation with MEMD, PSFU, the Uganda National Alliance for Clean Cookstoves (UNACC) and relevant local and industry stakeholders. Considering the Ugandan sector landscape, the grant will be targeting a small number of domestic distributors and incentivize (i) the development of partnerships between distributors and international and local manufacturers as well as (ii) technology transfer through investment in local assembly and production by international industry leaders.

26. Component 2 - Implementation of a Quality Assurance & Technical Support program: The project will help establish a framework for enhancing market transparency and consumer confidence through: (i) the provision of technical support to Ugandan manufacturers and distributors, and (ii) product testing at the Centre for Research in Energy and Energy Conservation (CREEC) to determine whether minimum performance requirements are met and ensure the consistent quality of stoves manufactured by beneficiaries of the DCF throughout the duration of the project.

27. Component 3 - Institutional Development and Operational Support: This activity will entail the following financial and technical support to the implementing entity and key stakeholders through the provision of (i) support for coordination and integration with existing MEMD efforts, particularly focusing on promotion of institutional cookstoves, and (ii) outreach to institutional consumers, specifically schools, through advocacy and demonstration. The selection and screening of appropriate technologies for demonstration will be detailed in the project operations manual.

28. The required budget for operational and procurement expenses by PSFU and MEMD administration will be detailed during the project appraisal stage. Assistance to PSFU and MEMD may include the appointment of a Senior Sector Advisor with extensive experience in the clean cooking sector and/or a Procurement Specialist to support and accelerate the processing of competitive grant processes and disbursements.

29. Implementation arrangements and Flow of Funds: The proposed project will be led by the Ministry of Energy and Mineral Development (MEMD) and implemented by the Private Sector Foundation of Uganda (PSFU), which has also served as one of the implementing agencies for the Uganda Energy for Rural Transformation (ERT) phases I and II. PSFU consists of over 160 business associations, corporate organizations and government agencies. The PSFU established the Business Uganda Development Scheme (BUDS) as a specialized department/unit that implements matching grant programs for a variety of donors and government.

30. The grant financing will be provided to GoU which will transfer the funds to PSFU (project implementing unit) through a subsidiary agreement between PSFU and MoFPED and to MEMD as the lead overseeing agency. A separate designated account will be created for PSFU to manage the funds. The funds include provision for operational expenses for PSFU and MEMD to carry out the project.

31. Preparatory technical assistance will be provided through ACCES umbrella project: ACCES strives to design and pilot a set of tools and mainstreaming approaches to best reflect the priorities of different client countries and sector policies and help build the momentum and economies of scale needed for market transformation. Within this context, ACCES provides technical support for project design and implementation and leverages funding from the World Bank project operations to

maximize impact of clean cooking energy components.

32. ACCES follows a sequenced approach to address key barriers to sector development. Under each of the ACCES support lines, the Bank team will coordinate a succession of (i) Project design and mainstreaming activities: Bank-executed technical support, directed towards the design and mainstreaming of large-scale country-executed clean cooking interventions, and (ii) Roll-out of clean cooking programs: Government-executed clean cooking interventions consisting of large-scale country-wide programs prepared and designed with ACCES support.

33. Uganda was selected as an ACCES pilot country based on a rigorous selection process considering need, potential impact, and ongoing complementary World Bank energy activities in the country. The Bank and the Global Alliance for Clean Cookstoves (Alliance) organized a stakeholder consultation workshop in Uganda during November 28 and 29, 2012. The consultation was organized in close coordination with the Uganda National Alliance for Clean Cookstoves (UNACC) which is coordinating sector activities and the Uganda Country Action Platform (CAP). The consultation was designed to provide a framework for the stakeholders to discuss the draft Uganda CAP and provide input on the specific barriers and strategic interventions identified for the sector. The proposed project focus is based on the outcomes of these consultations.

34. Next steps: In preparation of this project, and in close cooperation with MEMD and PSFU, the Bank team will provide the data needed to narrow the initial set of eligible cookstoves and manufacturers with the most promising technologies, best reflecting the cooking needs and preferences of Ugandan households through a Willingness to Pay (WTP) and a Social Acceptance (SA) assessment featuring in-home product trials. The assessment will provide the basis for MEMD and PSFU to define minimum performance thresholds and determine key target consumer segment (s) according to geography, fuel use, income level, etc. and will further help elaborate the support activities outlined above.

#### 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:	2.2	Total Bank Financing:	0
Financing Gap:	0		
<b>Financing Source</b>			<b>Amount</b>



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