

**COMBINED PROJECT INFORMATION DOCUMENTS / INTEGRATED  
SAFEGUARDS DATA SHEET (PID/ISDS)  
CONCEPT STAGE**

**Report No.:** PIDISDSC17035

**Date Prepared/Updated:** 29-Apr-2016

**I. BASIC INFORMATION**

**A. Basic Project Data**

<b>Country:</b>	Rwanda	<b>Project ID:</b>	P158411
		<b>Parent Project ID (if any):</b>	
<b>Project Name:</b>	Rwanda Improved Cookstoves Project (P158411)		
<b>Region:</b>	AFRICA		
<b>Estimated Appraisal Date:</b>		<b>Estimated Board Date:</b>	31-Aug-2016
<b>Practice Area (Lead):</b>	Environment & Natural Resources	<b>Lending Instrument:</b>	
<b>Sector(s):</b>	Other Renewable Energy (100%)		
<b>Theme(s):</b>	Climate change (50%), Pollution management and environmental health (25%), Gender (25%)		
<b>Borrower(s):</b>	Inyenyeri and DelAgua Health Rwanda		
<b>Implementing Agency:</b>	Inyenyeri, DelAgua		
<b>Financing (in USD Million)</b>			
	<b>Financing Source</b>		<b>Amount</b>
	Borrower		27.60
	Carbon Fund		10.20
	Total Project Cost		37.80
<b>Environmental Category:</b>	B - Partial Assessment		
<b>Is this a Repeater project?</b>	No		

**B. Introduction and Context**

**Country Context**

Although Rwanda has a strong record of robust GDP growth, with a GNI per capita of \$644 (2013), the country still ranks amongst the poorest in the world with high levels of vulnerability. It is a small land-locked country of 26,338 km<sup>2</sup> in area and a population of 11.7 million people (national census, 2012). It is densely populated in comparison to other African countries: at 480

people per km<sup>2</sup>, population density is similar to the Netherlands and South Korea (World Bank statistics). Even though population growth has come down substantially over the past fifteen years, with a projected 2.5% annual growth rate according to the United Nations, Rwanda will need to accommodate roughly 7.8 million additional people by 2030, underscoring the importance of introducing environmentally friendly technologies.

Strong policies have helped Rwanda achieve outstanding economic progress and introduce progressive reforms in various sectors. Prudent fiscal and monetary policies geared towards maintaining macroeconomic stability, coupled with an emphasis on building institutional capacity, promoting good governance, and creating a business-friendly environment, contributed to low inflation and average annual economic growth above 8% over the last decade. Rwanda's macroeconomic performance has generally outperformed its regional peers and earned the country a spot on the list of the 10 fastest-growing economies in the world, and has recently been ranked the seventh most efficient government globally (Global Competitive Report, 2014-2015). The country has also made important strides in poverty reduction and is introducing reforms to strengthen its social protection system by expanding coverage and improving efficiency to reach more vulnerable groups. The country-defined poverty rate fell from 59 to 45% during the previous decade and extreme poverty dropped from 40 to 24%.

Population and economic growth is leading to rapidly increasing demand for energy. Energy demand growth is particularly being felt in the biomass sector (the dominant energy source for the country), where sustainable production of wood fuel has been assessed to fall short of consumption. Reducing environmental damage and ensuring access to affordable and modern sources of energy are essential to achieve the country's development objectives. Providing well targeted assistance to the poorest households is in line with the country's flagship Vision Umurenge Program which reaches a growing number of poor and vulnerable households through cash transfers, public works and microcredit loans.

Rwanda's Economic Development and Poverty Reduction Strategy (EDPRS) 2013–2018 specifically includes the aim of “rural households using more efficient cooking methods” (Outcome 4.3, see Annex 5). The EDPRS notes that over 85% of Rwanda's primary cooking energy source is biomass (wood and agricultural residue), the most economic option for rural households. Noting that biomass needs to be used in a sustainable, safe and efficient way, “use of improved energy efficient cooking stoves will be promoted...working with the private sector.” (EDPRS paragraph 3.78). Many improved cookstoves both reduce the amount of biomass fuel needed, and also greatly expand the range of biomass that can be used for fuel – they are able to use crop waste and other biomass that burns far too quickly in a traditional three-stone fire to be used as fuel other than in desperate fuel scarcity circumstances.

### **Sectoral and Institutional Context**

More than 700 million Africans (82%) use solid fuels for their primary cooking needs, a number that is expected to reach 850-950 million by the end of the decade. This high level of solid fuel use combined with household reliance on inefficient and unsafe traditional cookstoves cause a first order public health crisis: Household air pollution (HAP) from solid fuel cooking emissions kill nearly 600,000 Africans annually and is now recognized as the second largest risk factor for death and disability in the region. Solid fuel cooking also imposes significant costs on African households and economies, with a mid-range estimated opportunity cost of 3% of regional annual GDP – including avoidable spending on solid fuels, productivity losses due to firewood collection, economic costs of increased mortality and morbidity, and the environmental and

climate costs of deforestation and carbon emissions. While the negative health impact of solid fuel based cooking is well understood with clear evidences, methodologies for evaluating the positive health impacts of cleaner cooking interventions, especially interventions focusing on improved cookstoves are still evolving.

Africa has a significantly lower rate of access to clean and improved cooking solutions (about 25%) than any other region globally. The clean and improved cooking sector in Sub-Saharan Africa (SSA) has evolved significantly but is still highly underdeveloped. Only 11% of Africans use “clean” stoves that run on modern fuels like LPG (5%), or electric stoves (6%). Stoves that run on renewable fuels like biogas, ethanol and solar are uncommon (less than 1%) and the penetration of advanced biomass gasifier cookstoves (less than 0.1%) that approximate desirable Tier 4 emission performance as defined by an ISO Working Group is still at the pilot stage . A growing number of SSA households (about 3.5%) use intermediate Improved cook stoves (ICS, e. g. rocket stoves) which are more fuel efficient than traditional 3-stone stoves, and contribute to PM 2.5 emissions reductions needed to realize health benefits. Another 9-10% of SSA households have access to both basic ICS and legacy cookstoves that offer only moderate improvements in fuel efficiency and emissions reductions over traditional cooking technologies. Although no biomass cookstove technology eliminates or even addresses the majority of the burden of disease from biomass smoke exposure, many ICS can reduce the burden of disease cost-effectively, achieving a discernible improvement over the traditional 3 stone stoves widely used by the rural poor.

Wood (biomass) is the dominant household fuel in Rwanda, accounting for 93% of fuel use in rural areas and 45% in urban zones, with charcoal accounting for another 51%. This huge dependence on wood fuels mainly for cooking causes major health issues and deforestation. Rwanda lost 37% of its forest cover (around 117,000 ha) between 1990 and 2010 . Recent efforts by the Government to save and restore forests have yielded positive results. Over 80% of the country’s firewood and charcoal, mainly for urban areas, is currently believed to come from Eucalyptus trees in artificial and dedicated plantations and agro forestry programs. However, estimates of sustainable harvest of biomass vary considerably. According to a 2012 report by the Global Alliance, the annual demand for woody biomass in Rwanda is estimated at 2.9 Mt, which is more than double the available sustainable production of 1.1 Mt . A World Bank report cites the estimated sustainable wood-fuel supply as between 1.5 and 2.5 million ton/year or 55 to 95% of demand. The UNFCCC , estimates the nonrenewable fraction of the biomass at 98%, pointing to very high unsustainable harvest of biomass. Although estimates of sustainable biomass supply are increasing (with higher resolution remote-sensing imagery, and perhaps with increased silviculture), the high dependence on wood, rapidly growing population and limited land resources undoubtedly mean that the sustainability of wood fuel production remains a serious concern. Prices of charcoal in Rwanda have also increased rapidly, generating negative spillover effects on the urban economy, and suggesting that all wood fuel production may be more costly.

The Five Year Strategic Plan for the Environment and Natural resources Sector (2014-2018), developed by the Rwanda Ministry of Natural Resources, recognizes that forestry resources can contribute to economic growth and poverty reduction if Rwanda can increase forest cover and tree density in agricultural landscapes across the nation and achieve more sustainable management of agricultural ecosystems and forestry resources. Rwanda’s Economic Development and Poverty Reduction Strategy-II (EDPRS-II) 2013-2018 retains forestry as a main concern in recognition of its prime contribution to the GDP. It aims to reduce the use of biomass energy through the use of

improved stoves and improved kilns. EDPRS II 2013-2018 reaffirmed the previous target of increasing forest cover to 23.5% by 2012 and set a new goal of 30% by 2018. EDPRS II 2013-2018 also recommends sustainable management of forest biodiversity and critical ecosystems through protection and maintenance of 10.25% of the land area, and reduction of wood energy consumption to 50% by 2020 as reflected in the 2020 Vision targets.

The Government of Rwanda (GoR) Energy Sector Strategic Plan (2013-2018) identifies dissemination of improved cookstoves (ICS) as one way to reduce fuel wood consumption. The long term goal of the Government is to reduce fuel wood consumption from current 94% to 50% of total energy use. Cooking efficiency is low in rural households mainly due to lack of adequate technologies. The Rwanda Energy Group (REG) is targeting 80% of households to have access to improved cookstoves by 2017 and 100% of households by 2020. Improved cookstoves can reduce fuel consumption by 30-70% compared to traditional stoves and open fires. They also effectively increase the supply of fuel by being able to use crop residues and small-diameter shrub and plant materials that burn too quickly to be used as fuel in traditional “three-stone” cooking fires. The potential market for improved cookstoves in Rwanda is estimated at about 2.4 million households. In the past, the Rwandan Army installed basic cookstoves in many rural households. More recently, ceramics cooperatives in several parts of the country have been trained to produce an improved wood-burning stove, locally referred to as canarumwe. Despite being sold for only a few dollars, the market for canarumwe stoves remains modest. Although it is claimed that about 50% of households have adopted some form of improved cookstoves (ICS), the actual performance of these ICS in energy savings and other benefits vary considerably and most are only marginally better, if at all, than traditional three stone open fires and traditional metal charcoal stoves. However, more recent designs of ICS have better efficiency, durability and usability, and there is huge potential to achieve reduced fuel wood consumption and health benefits. The Government is supportive of private sector efforts to promote and distribute more advanced ICS, and has agreed to waive import duties and VAT on cookstoves that are performance-rated at tier 2 or above, in recognition of the social benefits they bring.

From the health perspective, evidence is robust and compelling: exposure to household air pollution is responsible for a staggering number of preventable illnesses and deaths each year. Epidemiological studies have established exposure-response relationships between inhalation of particulate matter, carbon monoxide, and other harmful products of incomplete combustion of bio-fuel cooking, and diseases including acute lower respiratory illness and pneumonia, chronic obstructive pulmonary disease and lung cancer, and ischemic heart disease. Particulate matter of 2.5u is the primary cause of household air pollution, followed by carbon monoxide in an increasing number of studies. Evidence is also growing on the relationship between biomass smoke exposure and cerebrovascular disease, premature and underweight births, cataracts, deteriorated eyesight, asthma, tuberculosis, adverse pregnancy outcomes, pediatric sleep disorders, bacterial meningitis, depression and headaches. Physical injuries, substantial time and additional nutritional demands associated with firewood collection, and burns from open fires add to the negative health impact of traditional cooking practices. The World Health Organization (WHO) estimates that exposure to smoke from cooking fires is the fourth leading risk factor for disease in developing countries, and causes 4.3 million premature deaths per year – exceeding deaths attributable to malaria or tuberculosis. In addition, tens of millions more fall sick with illnesses that could be prevented with improved adoption of clean and efficient cookstoves and fuels. Cleaner burning more efficient cookstoves can help alleviate some of this huge burden, and the associated costs of health care, productivity loss, and reduced quality of life.

With more than 95% of the total population using biomass fuel for cooking, HAP exposure is the leading behavioral health risk factor in Rwanda and accounts for nearly 6% of the total burden of illness (Figure 1). Rwanda has one of the highest incidence of HAP-related morbidity in Sub-Saharan Africa, at 63 HAP-associated Disability Adjusted Life Years (DALYs) per 1000 people. The risk to health damage from widespread use of harmful cooking technologies and fuel types is intensified by cooking behavior – notably, a relatively higher tendency than in many other SSA countries to cook indoors in unventilated kitchens. Each year in Rwanda, there are 5,680 deaths a year related to household air pollution, 94% of which are children. Another estimate is that around 12,500 deaths and 493,000 DALYs are attributable to solid fuel use in Rwanda. Respiratory and other illnesses caused by HAP reduce productivity and quality of life, generate costs for health system, and result in additional demands on health personnel. The relatively high number of DALYs and deaths attributable to HAP present a strong case for cleaner cookstove interventions in Rwanda.

Rwanda's Third Health Sector Strategic Plan (July 2012-June 2018) recognizes the importance of indoor air pollution and the need to put in place appropriate environmental health strategies and interventions (i.e. national behavioral change communications strategy; national plan for surveillance of health and the environment; peer to peer group sensitization through existing community networks; tapping the network of community health workers and building their capacity to promote behavior change). A multi-sectoral environmental health policy and strategy has been designed and is being implemented through strong coordination mechanisms involving all sectors at the national, district and community levels. The Environmental Health Desk of the MOH leads the technical working subgroup handling issues related to household sanitation, and hygiene promotion. The Environmental Health Program consists of a variety of interventions, including drinking water quality surveillance, indoor air pollution, and climate change.

Exposure to toxic pollutants and other health and welfare impacts from use of biomass stoves is highest amongst women and young children, as they spend a disproportionate amount of time cooking and collecting biomass. Efficient cookstoves also support better nutrition both by enabling more food to be cooked in circumstances of dire combustible biomass shortages, and because gathering firewood can consume 10-15% of minimum daily food calorie intake --a meaningful amount in times of food stress. When cookstoves are introduced by community health and agricultural workers this offers an opportunity to combine awareness raising and nutritional support to promote behavior change and support sustained use. Finally, women and girl children spending two or more hours a day gathering wood suffer from chronic muscle and spinal strain from the burden of carrying wood over long distances, and may be subject to physical abuse and other risks while walking alone. Reduced risks, as well as productivity gains for women and time freed up to attend school for girl children are important outcomes of fuel-efficient cookstoves, both by reducing biomass fuel needs by half to three quarters, and because the range of biomass that can be burnt efficiently in many improved stoves expands the pool of available biomass making crop residues and small twigs usable fuels, all of which are available closer to village communities.

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

The World Bank Country Partnership Strategy (CPS) 2014-2018 recognizes the likely consequences for natural resources and the environment that the changes associated with Rwanda's rapid growth paths may have. Sustaining growth of over 7.5% per year implies changes in how land and other natural resources are used. High reliance on wood fuels and biomass energy

has the potential to deplete soils and reduce water catchment effectiveness, requiring greater use of sources from sustainably managed forests and on-farm forestry integrated with conservation agriculture. The CPS (2014-2018) identifies opportunities for the private sector in improving productivity and efficiency in the use of biomass for energy in the context of environmental sustainability.

The joint UN-WB Sustainable Energy for All initiative (SE4All) sets a goal of universal access to modern energy by 2030 that explicitly includes clean cooking. The Rapid Assessment Gap Analysis carried out for Rwanda in the context of Sustainable Energy for All (SE4ALL), emphasizes the important rural economic benefits related to the use of biomass that should not be overlooked. The Biomass Strategy notes that creating a sustainable biomass supply has much higher employment and other net economic benefits than importing more petroleum fuels to meet the energy demand. Therefore, although access rates to commercial non-solid fuels are low, the solution for Rwanda is not necessarily to expand access to fossil fuels, but rather to expand supply of sustainable biomass, and achieve more efficient use. An essential element of Rwanda's SE4ALL strategy is therefore to improve the efficiency of cookstoves in order to close the gap between supply and demand, and to reduce the environmental effects of biomass cooking, in particular household air pollution.

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

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

The project development objective is to reduce the use of woody biomass for cooking through promotion of improved cookstoves, and to assess the effectiveness and health benefits of contrasting stove / business models.

#### **Key Results**

Proposed PDO indicators are as follows:

- (i) Reduction in use of woody biomass;
- (ii) Assessment of effectiveness of different business models, with and without carbon finance, and their potential for scale up;
- (iii) Assessment of health outcomes of different stove technologies and behavioral change interventions;
- (iii) Number of direct project beneficiaries.

### **D. Concept Description**

Two Rwanda-based private companies –Inyenyeri and DelAgua – have approached the World Bank, in response to a Call for Proposals, for funding from the Carbon Initiative for Development (Ci-Dev) Trust Fund, a carbon facility that supports innovative business models through purchase of certified emission reductions. Their two proposals were selected as the most promising and innovative of 25 cookstove projects submissions received by Ci-Dev internationally. The proposals are based on contrasting business models, largely targeting different market segments and making use of different stove technologies, and are both associated with sophisticated studies of the reduction of HAP and the potential health benefits in beneficiary households.

The two companies would expand the improved cookstove sector in Rwanda in quite different ways. To allow for financing of both of these innovative projects, and to support a process of learning from their scale up, the proposed Bank operation has 2 complementary components.

Component 1: Results-Based Carbon Finance Payments. Ci-Dev will purchase carbon credits -- up to 500,000 CER from Inyenyeri and up to 1 million CER from DelAgua, and would also offer an optional purchase of additional 500,000 CERs to each company. The scale of the business needs to be evaluated carefully during appraisal stage. The exact commercial terms of the carbon transaction will be determined during project preparation, informed by financial and other analysis. Both projects rely on carbon finance to achieve the scale and demonstration effects that will establish viable businesses (see Annexes 5 & 6 for the summaries of the financial due diligence and the expected role of carbon finance for each project). The graph in Annex 4 shows the household segments (by income level) that are the likely potential market for each company.

Component 1a: Introduce Advanced Cook Stove Technology and standardized fuel to replace inefficient charcoal and wood stoves (up to \$4.0 m Ci-Dev, \$8.5 m loan, \$5.0 equity, \$0.5 m EEP Africa grant). Under this subcomponent the Bank would support Inyenyeri, a local energy utility company in Rwanda, to scale up an innovative business model through purchase of emission reductions. The business model consists of the (effectively) free lease to customers of an advanced fan-driven forced-draft biomass gasifier stove (considered the cleanest & most efficient type of solid biomass stove), on the condition that they may only use it with Inyenyeri's Biomass Fuel Pellets (BFPs: produced from compressed woody biomass). Urban (previously charcoal-using) customers purchase BFPs through Inyenyeri's BFP delivery network. Rural (or peri-urban) customers receive BFPs in exchange for supplying raw biomass (mostly small eucalyptus branches, although reeds and sawdust are also accepted) through a network of collection points. The combination of standardized BFPs and the high efficiency fan-driven gasifier stove allows Inyenyeri to serve 3 or more urban households (HHs) from every rural biomass-supplying customer, which still requiring those HHs to collect less biomass than they otherwise would have needed. The high efficiency of the system and the price of charcoal mean that Inyenyeri can charge a sufficiently high price to recover the cost of the leased stoves in a reasonable time period, whilst urban HHs still pay less for BFPs than they otherwise would for the same amount of charcoal-based cooking (around \$9 a month instead of \$15). Overall, the amount of woody biomass required across customer households is expected to decrease by around 90% once they are using the stove and pellets.

Inyenyeri's business model appears complex, but has evolved through trial and error during a multi-year pilot phase in Rubavu. The program has been well received, and not that they are switching to a new stove model with even higher efficiency and lower emissions, they are confident of their ability to grow rapidly in further urban markets, particularly Kigali, given sufficient capital. Their model is dependent on the willingness of existing charcoal users to purchase BFPs, which appears to be the case as long as BFPs remain functionally cheaper, given the additional benefits of cleaner and faster cooking from adoption of their stoves. Peri-urban customers have also shown a high level of willingness to exchange biomass for BFPs, although the company may explore alternate sources of biomass (e.g. professionally managed plantations) as their operations expand. Inyenyeri have support from the Ministry of Infrastructure for their program.

Ci-Dev will support the scale up of the business by purchasing 0.5 million certified emission reductions (CERs) with option to buy additional 0.5 million if this subcomponent is able to scale up and deliver more CERs.

Component 1b: Scaling up Intermediate Cookstove Technologies in Rural area (up to \$6m Ci-

Dev, \$5.6m equity, \$3.2m commercial loans ): Under this subcomponent the Bank would support DelAgua to build rural demand and markets for cost-effective, intermediate-technology improved cookstoves (Tier 2 and above in thermal efficiency) , through purchase of emission reductions. DelAgua has already distributed around 100,000 EcoZoom stoves to ubudehe category 1 & 2 HHs in western Rwanda through a partnership scheme with the Ministry of Health (MoH), using the Ministry's network of community health workers to support training and follow-up, as well as additional logistical support from government. Going forward, DelAgua will gradually follow commercial principles to disseminate a range of ICS models in a phased manner. Within ubudehe category 1 & 2 HHs in Eastern Rwanda, DelAgua will endeavor to recover the costs of the stoves by allowing the HHs either: 1) to be sales agents for DelAgua and pay for the stoves through their active involvement in community demonstration and marketing activities; or 2) to pay for the stoves through instalments over the stove lifetime. This is part of DelAgua's demand generation activities and can be scaled up readily as it utilizes an existing and reliable support network (through the CHWs).

DelAgua proposes to leverage the demand-creation and market-understanding derived from the above methods of dissemination to develop a retail operation, ultimately offering a range of ICS models. DelAgua will initiate an ICB process to procure different stoves with minimum Tier 2 thermal efficiency. Establishing commercial rural ICS markets is likely to be more challenging, but research commissioned by DelAgua on the basis of their pilot scheme in Western Rwanda concluded that close to 50% of rural HHs could be potential customers for retail sales. DelAgua will explore locally appropriate financing options and retail models through partnerships with savings and credit cooperative (SACCOs).

DelAgua will support awareness raising campaigns, behavioral change education and advocacy (particularly focused on the health benefits of shifting to outdoor cooking), training, repair and maintenance.

In order to assist DelAgua in its effort to gradually transition to a retail business, Ci-Dev would consider to purchase up to a total of 1 million emission reductions with no more than 0.5 million CERs coming from EcoZoom stoves disseminated under the demand creation phase; the rest would be conditioned on commercial sales.

Component 2: Evaluation of health outcomes and market viability (Ci-Dev BETF \$0.2m); \$1.9m LSHTM research grant; \$2.65m NIH research grant; \$0.25m (to be confirmed) Global Alliance for Clean Cookstoves research grant): Both companies are already involved in sophisticated randomized clinical trials (RCTs) to determine the health outcomes of their intervention. The health outcome evaluation of Delagua's program is being implemented by the London School of Hygiene and Tropical Medicine (LSHTM), Emory University, Oregon Health Science University, and Portland State University, with funding from private donors to LSHTM (\$1.9m). The health outcome evaluation of Inyenyeri's program is being implemented by the University of North Carolina, with funding from a National Institute of Health (NIH) research grant and the Global Alliance for Clean Cookstoves (\$2.9m). Both studies measure HAP levels, personal exposure to pollutants and disease incidence in program and control HHs. The study of Inyenyeri's will also look at the economics and factors driving the success of the enterprise. Initial results are encouraging; the DelAgua study found greater than 70% reduction in PM 2.5 exposure levels when families cooked outdoors on their improved stoves.

Under component 2, Bank-executed funds from the Ci-Dev readiness capacity development trust fund would be used to fill gaps in the existing studies mentioned above (e.g., there remains a need to collect and analyze data from health centers in DelAgua target districts, which is important as recent studies suggest that major reductions to the most serious health impacts of HAP occur at low thresholds), and (i) leverage their findings to evaluate the health outcomes of the carbon finance operation, (ii) based on those outcomes, estimate the potential for averted Disability Adjusted Life Years (aDALYs) and explore the possibility of linking the program to aDAILY related results-based finance for cookstoves initiatives, as may be available in the market and (iii) assess the effectiveness of the business models of both companies by the end of the project, both with and without carbon and aDALY payments.

The DelAgua project has already registered its intervention in Rwanda as a Clean Development Mechanism (CDM) Program of Activities (PoA) with UNFCCC to claim the carbon credits, whereas the Inyenyeri project plans to claim the carbon credits through another CDM PoA that is registered and managed by a third party company Atmosfair. The legal agreement between Atmosfair and Inyenyeri will deal with the terms of engagement and issuance as well as transfer of carbon credits to Inyenyeri who can then transfer them to Ci-Dev.

Both DelAgua and Inyenyeri have put in place credible financing plans to mobilize resources from commercial and long term social impact investors to implement their projects. Both projects are counting on the carbon off-take agreement with Ci-Dev to realize these financings. The Bank's technical assistance to better define marketable health, productivity and black carbon benefits should help both companies create a platform for monetizing stove benefits and sustaining their interventions over time.

Proposed contractual arrangements. Ci-Dev proposes to sign Emission Reduction Purchase Agreement (ERPA) with DelAgua and Inyenyeri to secure forward purchase of up to 1.0 million CERs and 0.5 million CERs respectively. The price for the CER will be determined through application of Ci-Dev Pricing Guidelines and will be negotiated with the counterparts. Both companies will have an obligation to monitor and report the sales of stoves according to CDM requirements and the sales receipts should specify that the CER ownership belongs to the companies. Given the close interest of different government ministries in the programs of the two companies with in the Government, consultations will be carried out with the respective ministries and other key stakeholders before signing the ERPA. Expected steps for completion of project preparation and ERPA are as follows:

- Ci-Dev Participants decision/endorsement of PIN package (April 20, 2016)
- LoI signature between companies and World Bank (May 15, 2016)
- Finalization of environmental and social safeguards documentation (June 15, 2016)
- Updating Financial Due Diligence and determining the key ERPA terms (June 15, 2016)
- Completion of Project Appraisal (July 30, 2016)
- ERPA Signature (Aug 31, 2016)

## II. SAFEGUARDS

### A. Project location and salient physical characteristics relevant to the safeguard analysis (if known)

The project interventions will cover rural households in selected locations throughout Rwanda.

### B. Borrower's Institutional Capacity for Safeguard Policies

Neither Inyenyeri nor DelAgua have previously implemented World bank projects, and they are not familiar with the safeguards policies. However, both companies have produced health and safety information which is routinely shared with the recipient households. The project will include capacity building aspects to promote the health and safety compliance with both DelAgua and Inyenyeri operations.

### C. Environmental and Social Safeguards Specialists on the Team

Svetlana Khvostova (GEN01)

Tharcisse Musabyimana (GSURR)

Yasmin Tayyab (GSU07)

### D. POLICIES THAT MIGHT APPLY

Safeguard Policies	Triggered?	Explanation (Optional)
Environmental Assessment OP/BP 4.01	Yes	<p>The project is expected to have significant positive impacts by directly reducing exposure to household air pollution (HAP), reducing time spent on cooking and related activities, and reducing demand for woody biomass, through the introduction and promotion of a range of improved and advanced cookstoves. Given the nature of the interventions, negative environmental impacts likely to be caused by the project are minimal. There is a possibility that construction of small storage and fuel pellet manufacturing facilities may be required as the companies expand their operations. Disposal of quantities of damaged or obsolete cookstoves may also be required.</p> <p>Import of internationally manufactured stoves into the country may lead to some perceived negative social impacts in form of displacing small local entrepreneurs and artisan stove manufacturers. However, the market share of such players is small, the potential for direct competition is limited and the potential for beneficial effects through piggybacking on market develop is real. The project will produce an ESMF/ESMP checklist, based on the health and safety information on the operation of the cookstoves and share it with the stakeholders and publicly disclose these materials on DelAgua and Inyenyeri websites. The project will also provide continued sharing of these materials directly with the cookstove users.</p>
Natural Habitats OP/BP 4.04	No	

Forests OP/BP 4.36	TBD	The project will have beneficial indirect effect on trees and forests by reducing the volume of woody biomass consumed by participating households.  There is a possibility during the life of the project, that Inyenyeri may move from their current model of crowd-sourcing minor biomass to management of commercial plantations to support fuel pellet production.
Pest Management OP 4.09	No	
Physical Cultural Resources OP/BP 4.11	No	
Indigenous Peoples OP/BP 4.10	No	
Involuntary Resettlement OP/ BP 4.12	No	The project is not planning land acquisition and there is no involuntary resettlement anticipated under the proposed activities, therefore OP4.12 is not triggered.
Safety of Dams OP/BP 4.37	No	
Projects on International Waterways OP/BP 7.50	No	
Projects in Disputed Areas OP/ BP 7.60	No	

## E. Safeguard Preparation Plan

### 1. Tentative target date for preparing the PAD Stage ISDS

13-May-2016

### 2. Time frame for launching and completing the safeguard-related studies that may be needed. The specific studies and their timing should be specified in the PAD-stage ISDS.

The implementing agencies, DelAgua and Inyenyeri, will produce an ESMF/ESMP checklist to ensure that: (i) appropriate health and safety measures are incorporated into the training materials to be used at the household level; (ii) appropriate health and safety measures are followed for employees, including drivers and fuel pellet manufacturers; (iii) guidelines for construction of small-scale facilities are available, if needed, (iv) guidelines for development of appropriate forest management plans are available, if needed; (v) unwanted stoves and components are recycled as far as practicable; and (vi) customers are able to withdraw from stove leasing contracts without undue difficulty or prejudice. The EMF/EMP checklist will include a set of public consultations and will be disclosed in Rwanda and in the World Bank InfoShop.

## III. Contact point

### World Bank

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Title: Sr Natural Resources Mgmt. Spe

Contact: Kirtan Chandra Sahoo  
 Title: Senior Carbon Finance Speciali

**Borrower/Client/Recipient**

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**Implementing Agencies**

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**IV. For more information contact:**

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**V. Approval**

Task Team Leader(s):	Name: Stephen Ling, Kirtan Chandra Sahoo	
<b><i>Approved By</i></b>		
Safeguards Advisor:	Name: Johanna van Tilburg (SA)	Date: 29-Apr-2016
Practice Manager/ Manager:	Name: Magda Lovei (PMGR)	Date: 30-Apr-2016
Country Director:	Name: Yasser Aabdel-Aleem Awny El-Gammal (CD)	Date: 03-May-2016

1 Reminder: The Bank's Disclosure Policy requires that safeguard-related documents be disclosed before appraisal (i) at the InfoShop and (ii) in country, at publicly accessible locations and in a form and language that are accessible to potentially affected persons.