Inception Report

African Clean Cooking Energy Solutions Quality Assurance and Technical Support Program

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Prepared by:
Berkeley Air Monitoring Group
On behalf of the QA/TS Project Team



Acronyms

AFREA: ..... Africa Renewable Energy
BA: .....Berkeley Air Monitoring Group
BEIA: ..... Biomass Energy Initiative for Africa
CCT:..... Controlled Cooking Test
CEIHD: .....Center for Entrepreneurship in International Health and Development
CEO: .....Chief Executive Officer
CERER:.....Centre for Study and Research in Renewable Energy
CIRCODU: ..... Centre for Integrated Research and Community Development
CREEC:.....Centre for Research in Energy and Energy Conservation
CSU:..... Colorado State University
CV:.....Curriculum Vitae
DRC: .....Democratic Republic of the Congo
EECL: .....Engines and Energy Conversion Laboratory
ESMAP: .....Energy Sector Management and Assistance Program
ETHOS:.....Engineers in Technical Humanitarian Opportunities of Service
EWB:..... Engineers Without Borders
GVEP: .....Global Village Energy Partnership
IAP: ..... Indoor Air Pollution
ICS: ..... Improved Cookstove
ISO: .....International Standards Organization
IWA: ..... International Workshop Agreement
KPT: .....Kitchen Performance Test
LA: .....Lighting Africa
LOE:.....Level of Effort
MJ: .....Mega-joules
NGO:.....Non-Government Organization
PCIA: .....Partnership for Clean Indoor Air
PI:..... Principle Investigator
QA:..... Quality Assurance
RE: .....Renewable Energy
RELWA: ..... Renewable Energy Leader with Associates
SSA: ..... Sub-Saharan Africa
STAR: ..... Science to Achieve Results
SWOT: .....Strengths, Weaknesses, Opportunities, and Threats
TBD: ..... To Be Determined
TOR: ..... Terms of Reference
TS:..... Technical Assistance
TSF:.....Three Stone Fire
UNACC: .....Uganda National Alliance on Clean Cooking
USAID: .....US Agency for International Development
USEPA:.....United States Environmental Protection Agency
WASH:..... Water Supply, Sanitation, and Hygiene
WBT:..... Water Boiling Test

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1 Introduction

Berkeley Air Monitoring Group and its consortium partners seek to provide the ACCES initiative with a solid technical foundation by customizing existing standards frameworks, test methodologies, and quality assessment tools to support market development for clean cooking technologies in Senegal, Uganda, and DRC over the next year. The imperative to create robust technical underpinnings for the program is strong: more than 90% of families in SSA use biomass, which results in economic, environmental, health, and social impacts. It is critical that the cooking technologies promoted through ACCES provide real benefits to African families and communities as well as to the global climate and environment.

1.1 Using the Lighting Africa Model for ACCES

The Lighting Africa program provides a strong model for the African Clean Cooking Energy Solutions, with many elements that may prove equally effective for cookstoves. These include:

- Laboratory performance testing capacity;
- Non-laboratory (simple) quality assessment;
- Tiered incentives for product quality and performance targets; and
- Systematic creation and dissemination of technical product information to customers.

The ACCES stakeholder consultations held in 2012 across Sub-Saharan Africa also revealed that the cookstove sector faces many challenges that lend themselves to the Lighting Africa approach. Manufacturers reported the following key challenges:

- Insufficient incentives to improve production and quality of stoves and fuels;
- Lack of incentives for manufacturers to undertake stove and/or fuel testing;
- Insufficient number and capacity of certified laboratory testing centers to conduct stove/fuel testing and limited in-country capacity (including equipment and skills) to undertake field testing;
- Prohibitively high testing costs;
- Lack of national standards and norms for stoves and fuels; and
- Limited enforcement capacity.

For consumers and stove promoters, some of the reported challenges are:

- Lack of sufficient information and branding for consumers to differentiate between high and low performing stoves and fuels;
- Lack of available high-quality, low-cost products (or higher cost products with functional financing options); and
- Market spoilage, due to inconsistent testing and branding of stoves.

Cooking technologies, however, are also fundamentally different than lighting in several key ways, which the ACCES program will need to recognize and address. These include:

- Baseline cooking practices are more varied than lighting, and improved technologies need to support multiple, varied cooking styles/tasks;
- Improved cooking devices are mostly still used with unimproved fuels, introducing significant variability into their performance;
- The cook has a much greater influence on the performance of the stove than a typical user tends to exert over the operation of a lamp; and

For these and other reasons, stove performance measured in homes under less controlled, "natural" conditions can vary significantly from measured lab values.

1.2 Relevant Cookstove Sector Progress

The Global Alliance for Clean Cookstoves, and previously the Partnership for Clean Indoor Air, has been working to develop consensus on technical approaches to these cookstove-specific challenges. Selected milestones and accomplishments are summarized below.

- Lima Consensus reached. This multi-tiered framework is consistent with ACCES objectives of supporting multiple stoves in the market at different quality, performance, and price points.
- Basic lab test protocol (WBT) refined, agreed, and widely adopted. Standardized reporting framework being established.
- Additional test protocols being developed for different stove types, durability, and field testing. Stakeholder consultations in progress to incorporate durability and field metrics into a multi-tiered framework.
- Emissions performance framework to be aligned with forthcoming World Health Organization Indoor Air Quality guidelines, thus linking stove performance with health outcomes.
- International Workshop Agreement on cookstove standards reached in 2012.
- Formal global cookstove standard process launched through ISO.
- Technical/scientific training materials developed.
- Support provided for processes to develop country-specific cookstove standards, in tandem with ACCES and other stakeholders.
- Support provided to regional testing and knowledge centers to develop testing capacity and information sharing between groups around the world.

2 QA/TS Project Team Composition

Our consortium is composed of the following organizations and independent consultants.

- Michael Johnson (Senior Scientist) and Dana Charron (Managing Director), Berkeley Air Monitoring Group
- Elisa Derby (Senior Program Officer) and Katie Gross (Senior Program Associate), Winrock International
- Morgan DeFoort (Director) and Christian L'Orange (Fellow), Engines and Energy Conversion Laboratory, Colorado State University
- Joseph Arineitwe Ndemere (President), Centre for Integrated Research and Community
- Njirambo Margaret Matinga, Independent Consultant
- Arne Jacobson (Professor), Humboldt State University
- Peter Scott (President), BURN Design Lab and BURN Manufacturing

Berkeley Air Monitoring Group is a for-profit consultancy incorporated in California USA (C3189683) and founded in 2009. Our mission is to support the advancement of cleaner energy solutions in less developed countries for global health and climate benefits. We provide rigorous scientific field testing and monitoring services to a range of implementers and funders, working with a network of partners in Asia, Africa, and Latin America to provide cost-effective service delivery and build local capacity. We also offer technical support, analysis, and consulting for both program design and evaluation. Since our incorporation, we have completed more than 30 projects in 20 countries. Our staff has contributed to the authorship of over 20 research publications related to household energy. Our firm originated in 2001 at the School of Public Health at the University of California Berkeley as part of the Center for Entrepreneurship in International Health and Development.

Winrock International is a nonprofit organization that works with people in the United States and around the world to empower the disadvantaged, increase economic opportunity, and sustain natural resources. In response to needs initially identified through its agriculture and gender-focused activities, Winrock designs household energy and health solutions that are locally appropriate and incorporate advanced technology design, behavior change, market development, and monitoring. Winrock has previously managed the Global Village Energy Partnership Action Programs Fund (GAPFund), on behalf of the World Bank/ESMAP with 20 grantees in 11 countries, and the World Bank/AFREA Biomass Energy Initiative for Africa, with 9 pilots in 8 SSA countries. Winrock served as the Co-coordinator for the Partnership for Clean Indoor Air for 8 years, also helping to manage its integration into the Global Alliance for Clean Cookstoves, while supporting standards development activities for both entities. Winrock is USEPA's prime cooperator on cookstove capacity building activities, and USAID's prime cooperator on Health

and Energy-funded cookstove activities. Since its formation in 1985, Winrock has managed and implemented a pipeline over $1 billion in projects, many of these for the World Bank.

The Engines and Energy Conversion Laboratory at Colorado State University has been engaged in cookstove testing, research, and design for over a decade. In the last five years, the EECL has led a highly focused, multi-million dollar research, product development and dissemination project with a specific goal: to develop the most affordable, longest lasting, most efficient, and lowest emitting biomass cookstove possible within the cost and design constraints of a diverse global customer base. The program at CSU has developed international testing protocols, spearheaded the creation of international standards, tested and analysis dozens of stoves from manufacturers throughout the world, modeled and analyzed hundreds of internal stove designs, developed and field-tested over 12 commercially available products (in partnership with Envirofit), created and published physics-based models for stove design, and conducted field studies on health and performance of stoves. Among other analysis techniques, the facility is capable of modeling computational fluid dynamics, chemical kinetics, design durability through finite element analysis, and theoretic heat transfer.

Centre for Integrated Research and Community promotes health awareness, sustainable energy resource use and environment conservation by integrating research and development. CIRCODU has conducted several field-based assessments of cookstove interventions in Uganda and Tanzania, which have targeted impacts associated with fuel consumption, indoor air pollution, emissions, stove usage and related sales/uptake strategies, and livelihood indicators. Joseph Arineitwe Ndemere serves as the organization's president.

Dr. Margaret Matinga has a PhD in Energy and Health Anthropology from University of Twente in The Netherlands. Dr. Matinga is an independent consultant conducting research on energy and health, and energy and poverty. Dr. Matinga has worked on numerous household energy projects including initial research and recommendations for the design of ACCES.

Dr. Arne Jacobson served as the technical lead for product quality assurance for Lighting Global, which is associated with the Lighting Africa and Lighting Asia programs. He is the Director of the Schatz Energy Research Center and an Associate Professor in the Environmental Resources Engineering program at Humboldt State University. His areas of research and work interest include renewable energy technologies, energy access in off-grid areas, and energy deployment policy. He has extensive international work experience in Africa, South Asia, and Latin America.

Peter Scott is the Executive Director of BURN Design Lab and the CEO of BURN Manufacturing Co. Peter created BURN Design Lab and BURN Manufacturing Co to design and manufacture high quality clean burning cookstoves. BURN is currently developing a factory in

East Africa that will produce 3 million stoves in the next 10 years. He has worked with a number of partners such as Aprovecho Research Center, German Technical Cooperation, Nature Conservancy, USAID, World Vision, The Paradigm Project, ETHOS, EWB, and Mercy Corps. Mr. Scott was named as one of Foreign Policy Magazine's 100 Top Global thinkers of 2010. He was honored with an Ashden Award for supporting local producers in Southern Africa to create highly profitable institutional stove businesses.

3 Project Objectives

The Africa Clean Cooking Energy Solutions (ACCES) is a World Bank initiative to promote enterprise-based, large-scale dissemination and adoption of clean cooking solutions in Sub-Sahara Africa (SSA). The role of the Quality Assurance and Technical Support Program (QATS) is to establish quality specifications and develop testing methodologies to promote the manufacturing and distribution of clean, affordable, quality products.

The objective of this assignment is to initiate the building of an ACCES Quality Assurance (QA) program for clean cooking solutions in Africa and develop ways to link a technical support (TS) component to the QA program in order to improve the product quality and production capacity of manufacturers in Sub-Saharan Africa. The technical support activities will target both testing facilities and manufacturers and be linked with other ACCES pillars including Consumer Engagement, Business Development, and Access to Finance. In the first year, the QA/TS pillar will be focused on ACCES's initial three countries of engagement: Senegal, Uganda, and DRC.

4 Technical Approach

Given the legacy of Lighting Africa, the progress on ACCES to date, and the parallel activities being spearheaded by the Global Alliance, we propose an approach for the QA/TS pillar that brings together the sector's best technical practices and expertise applied to the manufacturing, testing, and standards landscape in each of the three initial countries of engagement. The following section lays out the specific technical and analytical tools that we would apply to achieve the objectives outlined in the ACCES QA/TS TOR.

4.1 Assessing country-specific quality landscape

- Conduct baseline assessments through a literature review to gain an overview of local household energy practices and improved cooking solutions and commercialization activities in each country. This process will also generate leads for in-country visits.
- Conduct interviews and site visits with the main cooking solution producers in all three countries. This information will seek to characterize and document the current capacity and potential capacity of each producer.

- Create non-laboratory criteria to qualify the technical quality of a product and/or manufacturer to ensure the quality and consistency of product. These criteria would constitute "best practices" that would address issues such as:
  - Product uniformity with attention to critical dimensions to ensure performance
  - Level of tooling
  - Internal and/or 3rd party QA/QC
  - Material specification and certification processes
  - Warranty (duration, coverage, etc.)
  - Batch and or component level tracking (serial numbers)
  - Monitoring and evaluation practices
  - Qualifying manufacturing capacity for a product and/or manufacturer
- Collect information on the global and relevant country-specific standards-setting processes and the status of efforts, if any, in each country to develop cookstove and/or cooking fuel standards. We are already aware of the efforts by the Uganda National Bureau of Standards to convene stakeholders for a cookstove standard in April 2013.

4.2 Improving and expanding country-specific manufacturing capacity, processes, and constraints

- Building on the information collected in the rapid baseline assessments and in-country visits described above, the team will analyze barriers to achieving product quality and performance and identify most effective approaches to help manufacturers overcome barriers. The team will perform analysis of country specific manufacturing capabilities (generically) along with analysis of supply chain, logistics, regulatory environment, and taxes and tariffs that may be pertinent to manufacturers.
- The assessment of manufacturing capacity and constraints will examine manufacturers along a continuum of scale, access to materials, and design sophistication. It will recommend strategies to improve quality and capacity for a variety of products and producers.

4.3 Benchmarking performance of baseline and improved cooking solutions and designing quality standards for ACCES-supported cooking technologies

- Identify 5-10 current, popular stove/fuel combinations as well as the most promising aspirational options in each of the three countries.

- Conduct water boiling tests on these technologies through contracts with Alliance-supported labs (CREEC in Uganda and CERER in Senegal) and partner organizations (SNV DRC) in each location in order to benchmark efficiency and emissions performance. (If test facilities in the DRC are not ready, DRC stoves can be tested at CREEC or another regional testing center.) A stove testing expert from the consultant team will coordinate with the labs to support WBT testing as needed. A total of 14 WBT testing sets have been budgeted for across the three countries.
- A set of stoves will also be tested at CSU to ensure comparability amongst the laboratories, providing an additional layer of confidence in the generated performance data.
- Testing data will be used to benchmark stoves and create an index of performance values that will underpin the design of the quality assessment plan.
- Using stove testing results derived from the standardized lab and field testing, we will evaluate the performance of stoves in each country context to recommend where/how to apply performance against the IWA tiers and/or country-specific standards for ACCES. Given the strong relationships between the Alliance and these organizations, we expect that the bulk of the standardized testing framework outlined in the IWA will serve both the goals of ACCES and these efforts.
- In each of the target countries, there is a group of key stakeholders concerned with the development of standards for cooking technologies. This stakeholder "contact" group will be kept informed of developments in the ACCES QA/TS pillar. We will share key deliverables with them and provide webinar/conference call opportunities for them to provide high-level feedback. Similar liaison activities will be undertaken with key stakeholders/leaders in the global ISO cookstoves standards process.
- Testing data will also be used to inform the design of the technical specification sheets and other market communications regarding quality and performance.

4.4 Assessing local laboratory capacity and creating a plan for ACCES testing support

- We will build on the contacts that our team has had with personnel from the country labs in Senegal and Uganda and World Bank partner organization SNV in DRC through the Global Alliance standards and testing program to assess what kind of support they are seeking.
- Members of our technical team will coordinate with the testing laboratories well before testing is started to assess their capacity and potential needs for the required testing. The team will also visit the labs during the country visits (described above), which will give

them the opportunity to make observations and have specific technical conversations with the lab operators to review best practices, quality control and assurance procedures, and any other additional challenges, needs, and capacity.

- As noted above, several stoves being assessed in-country for base-lining purposes will also be tested at CSU's Engines and Energy Conversion Laboratory. This activity will provide a pragmatic framework for comparing testing techniques and results, in order to foster the collaborative development of best practices that can be standardized across the regional testing centers.
- As the project reaches the stage of being able to estimate the volume of stoves that will likely apply for different levels of ACCES support, the technical sub-team will make recommendations on how best to expand and organize testing services for the three target countries and, in the longer term, for all of SSA.
- Based on these testing experiences and in partnership with the designated labs, the consultant team will recommend test protocols for ACCES including laboratory performance test, field tests, and where possible, systematic but non-technical assessments for elements of stove and fuel quality.

5 Project Management

What follows is our proposed work-plan which will be finalized by all staff (together with the implementation schedule) directly following contract signing with the World Bank.

5.1 Work Plan and Timeline

Inception Report: presentations of proposed activities

Lead: Berkeley Air

Timing: Month 1; Duration: 2 weeks

Deliverable: Submission of inception report; delivery date 4 weeks after signing of contract

5.1.1 **Task 1**: Rapid baseline assessment of knowledge, capacity, and investment gaps in standards, testing, quality assurance, and technology development efforts for stoves

Review published and gray literature (for each country) for known lab/field testing already undertaken; stove quality/performance results from these tests; standards activities in progress; available information on manufacturing capabilities and capacity. To the extent possible, we will identify in each country the primary products, manufacturers, testing centers, and cookstove

quality standards' stakeholders and create a broad map/categorization of the sector in each country.

Lead: Winrock International

Timing: Month 1-2; Duration: 3 weeks

Deliverable: Submission of rapid baseline assessments; delivery date 6 weeks after signing of contract.

5.1.2 **Task 2:** Develop the ACCES tiered QA system that is contexted within international standards and certifications for stoves and fuel production technologies

Task 2.1: Develop draft cookstove product/manufacturer quality assessment tool (non-laboratory). The objective is to identify best practices in stove design and production that are associated with superior product quality, including performance, durability, and usability. While this tool will not replace performance testing, it will provide a starting point for segmenting the sector, prioritizing limited testing resources, and designing appropriate tiered technical services.

Lead: CSU

Timing: Month 2; Duration: 2 weeks

Deliverable: Inception report on tool developed for product/manufacturer quality assessments; delivery date 8 weeks after signing of contract

Task 2.2: Plan country data-gathering visits with guidelines, contact lists, and where appropriate, itineraries and appointments, specifically manufacturers and testing center interviews/visits. (see Task 2.4 for details.)

Lead: Winrock International

Timing: Month 2; Duration: 2 weeks

Task 2.3: Cookstove standards liaison. Define a global contact group who will liaise with ACCES on cookstove standards. Convene contact group for initial webinar and discussion of ACCES QA/TS workplan and standards landscape in the initial countries of engagement. Contact group may include Ranyee Chiang/Alliance, Jim Jetter/USEPA, John Mitchell/USEPA, Tami Bond/University of Illinois-Urbana-Champaign, Dean Still/Aprovecho, Arne Jacobson/Humboldt State University. Identify similar point person or small group in each of the three target countries that will be point of contact for ACCES QA/TS team regarding national standards' developments for cookstoves and fuel technologies. Contact groups may include

CREEC, CERER, Uganda National Bureau of Standards (UNBS), Uganda National Alliance on Clean Cooking, Association sénégalaise de Normalisation (ASN), SNV, and GIZ.

Lead: Berkeley Air
Timing: Month 2; Duration: 2 weeks

Task 2.4: In-country data gathering in Senegal, Uganda, and DRC. Conduct interviews with key manufacturers, existing testing centers, standards agencies, and other key in-country stakeholders. Visit production facilities and distribution points, and using the non-laboratory quality assessment tool, conduct evaluation of manufacturing materials, processes, and resulting cookstoves. Ground-truth and refine the broad map/categorization of the sector, with special attention to manufacturer attributes such as capacity, access to materials and resources, and expertise. These initial country visits do not include performance testing (whether laboratory or field based) or consumer/market research, although the team will liaise actively with teams collecting field data for other ACCES pillars.

Through the country visits, the project team will seek to characterize and understand common barriers to quality that the ACCES QA system will need to address. It will also document the process and factors that have led some manufacturers to achieve higher product quality. The tQA system will then be designed to tackle the observed quality barriers and replicate successful quality improvement through targeted technical services and financing. It is expected that many but not all of the barriers to cookstove quality and opportunities for improvement observed in the initial three countries of engagement will be relevant in other parts of SSA as well. At the same time, ACCES expects to add new components to its quality framework as the program is rolled out in additional countries in subsequent years.

Lead: Berkeley Air
Timing: Months 3 & 4; Duration: 6 weeks

Task 2.5: Draft ACCES quality and performance assessment methods, including defined protocols, which will build on existing performance and safety protocols and incorporate other quality measures developed for ACCES. The recommendations will be contexted within the manufacturing, testing, standards, and quality landscape described in the strategy and implementation plan. Relevant specification for selecting stove and fuels for testing will be included. Report will also include recommendations for building the necessary short-term capacity to conduct the in-country lab testing described in task 3.2. The result will be a definition of quality metrics that can be used throughout the ACCES program and a set of

accepted methods for measuring those indicators, which is another key building block of the ACCES quality assurance system. This deliverable is expected to build closely on the IWA and the continuing ISO efforts to define standards and measurements tools.

Lead: CSU

Timing: Month 5; Duration: 2-3 weeks

Deliverable: Submission of stove quality global testing methodology; delivery 5 months after signing of contract

Task 2.6: Share strategy plan and testing method with global and country-specific standards contact groups. Invite feedback via email and/or conference calls.

Lead: Berkeley Air

Timing: Month 6; Duration: 2 weeks

5.1.3 **Task 3:** Benchmarking to decide in-country standards for World Bank ACCES support.

Task 3.1: Conduct testing at CSU laboratory on a subset of stoves from initial countries of engagement in order to provide a reference data set for in-country testing. Up to 5 cooking technologies will be tested.

Lead: CSU

Timing: Month 6; Duration: 2 weeks

Task 3.2: Undertake in-country controlled laboratory testing of common and aspirational cooking technologies for emissions and efficiency performance. Across the three initial countries of engagement, a total of 14 technologies will be tested. Stoves from the DRC will likely be tested in Uganda, unless a testing center in DRC is fully brought on-line prior to month 7 and deemed ready to undertake these tests by the QA/TS team. The successful and timely conclusion of this task is contingent on the prior implementation of the recommendations made in the country baseline assessments (Task 1.6). If additional testing equipment is recommended, this equipment will be funded from sources outside of the ACCES QA/TS budget. Testing results will be analyzed and compared to identical tests conducted at CSU for quality control.

Lead: CSU

Timing: Months 7; Duration: 2-3 weeks

Task 3.3: Draft ACCES minimum quality standards and recommended performance targets for each of the three initial countries of engagement based on the stove performance benchmarking. The benchmarking will be conducted using the quality indicators and methods determined in Task 2.5, and the results will provide a comparative map of common and aspirational technologies across several quality indicators. While the indicators and their measurement methods will be uniform across the ACCES program, the map of available technologies in each country will be unique. The benchmarking exercise will allow the project team to recommend performance thresholds and targets for the program that are relevant to the manufacturing, testing, standards, and quality landscape in each country. Relevant technologies for which suitably rigorous, independent, and protocol-appropriate testing has been conducted may be included as part of this benchmarking without further testing.

Lead: Berkeley Air

Timing: Months 8 - 9; Duration: 1 month

Deliverable: Submission of ACCES Minimum Quality Standards and Recommended Performance Targets document for each country; delivery 9 months after signing of contract

Task 3.4: Share strategy plan with global and country-specific standards contact groups. Invite feedback via email and/or conference calls.

Lead: Berkeley Air

Timing: Month 9; Duration: 2 weeks (overlaps with tasks 4.2 and 4.3)

5.1.4 **Task 4:** Design and develop packages of support for manufacturers and testing sites.

Task 4.1: Design beta templates for QA agreement between manufacturers and testing centers, and between ACCES and (1) testing centers and (2) manufactures. We envision a quality assurance system in which producers who meet certain threshold criteria will qualify for a variety of business and technical support. The testing centers will play a key role in determining which products meet the threshold criteria. The QA agreements will codify each party's responsibilities to the other and to the ACCES program, and they will cover such topics as who will pay for testing services, what testing capacity is expected, and how the resulting data will be presented in the marketplace.

Lead: Winrock

Timing: Month 7; Duration: 2 weeks

Deliverable: Submission of QA agreement templates; delivery 6 months after signing of contract

Task 4.2: Design and develop technical support packages for testing centers to improve testing capacity and volume. Develop document outlining best practices and standardized QA/QC procedures for testing, data collection, and data management, and propose mechanisms for delivering technical support packages. The type and level of support offered to the testing centers will be informed by the results of the expert visits at the beginning of the project and by the in-country performance testing. It will also be matched to the annual targets that the team will set for manufacturer participation in each country, and it will seek to help the testing centers become independent and self-sustaining in the longer term.

Lead: Berkeley Air with support from CSU

Timing: Months 10-11; Duration: 6 weeks

Task 4.3: Design and develop technical support packages for manufacturers to improve production processes, tools and materials for improved capacity and product quality, including best practices for design specifications, QA/QC, methodologies and protocols for tracking performance and durability and others. Propose mechanisms for delivering technical support packages. These support packages will be informed by the data-gathering visits to different kinds of producers at the inception of the project and will address key barriers to quality identified at that time Task 2.4). The guiding principle will be to make specific investments of financial and human capital provided through other pillars of the ACCES program and targeted at manufacturers whose products could be pushed into a higher quality tier through this support. Although the QA packages will seek to address mainly technical barriers to quality, they will be

coordinated with other offerings from other pillars promoting business support in such areas as marketing and governance.

Lead: Winrock with support from Peter Scott, CSU and Berkeley Air

Timing: Months 10-11; Duration: 6 weeks

Deliverable: Submission of QA/TS support packages documents; delivery 11 months after signing of contract

Final Deliverable: Develop QA/TS strategy and implementation plan.

Informed by the country visits, the ACCES program objectives, and the team's overall knowledge of the sector's technical development and drive towards standardization, this document will set forth a five-year vision for the QA/TS pillar for SSA based on ISO IWA tiered system with a three-year strategy and implementation plan. The report will include a presentation of the different sector components including testing centers, standards stakeholders, and typical classes of manufacturers and production chains. Strategies for overcoming barriers to quality relevant to each of these sub-sectors will be explored, and a plan for operationalizing technical support and linking it to quality assessments will be proposed. This report will also include both the quality indicators that are the focus of the initial year, such as laboratory performance testing, manufacturing processes, and testing capacity, as well as other metrics of interest, including but not limited to assessment of durability and field performance testing.

Lead: Berkeley Air

Timing: Month 10 & 12; Duration: 1 month

Deliverable: Submission of Strategy and Implementation Plan for QA/TS regional program; draft due mid-month 10 and final due 12 months after signing of contract

Closing Report: PowerPoint presentation of work completed over course of the contract.

Lead: Berkeley Air

Timing: Month 12; Duration: 1 week

Deliverable: Submission due 12 months after signing of contract.

5.2 Project Team Roles and Responsibilities

Berkeley Air will be the prime consultant and will provide the overall project coordination of the QA/TS pillar activities. Ms. Dana Charron will be the project lead, and Mr. Peter Pagnucco will provide the contract administration. Ms. Charron has been working on cookstove projects for

more than 12 years, including managing multiple projects in SSA. She is also fluent in French. The remaining consultants will be divided into two teams: one focused on technical tasks and the other concerned with outreach and market development.

The technical team will have primary responsibility for conducting the assessments and benchmarking, evaluating and making recommendations on lab capacity, spearheading the tiered QA system, and codifying test methods. The technical team will be coordinated by Dr. Michael Johnson (Berkeley Air) working closely with Dr. Morgan DeFoort (CSU). Drs. DeFoort and Johnson are both leaders in the cookstove standards and testing field and contributed significantly to the ISO IWA process. Dr. Johnson's capability is in field assessments and especially cookstove emissions and efficiency testing, while Dr. DeFoort's expertise focuses on laboratory evaluations of combustion, materials and durability. Other members of the technical team will be Dr. Christian L'Orange (CSU) who has extensive laboratory cookstove testing experience, and Joseph Ndemere, whose technical firm CIRCODU has conducted many stove assessments in Uganda. Charity Garland, technical associate from Berkeley Air, will also be part of the team to assist with literature searches and data processing and analysis.

The implementation team will primarily draw on their knowledge of the cookstove sector in each of the initial countries of engagement to identify key players and organize the country visits, focusing on assessing manufacturing needs and designing effective the technical assistance plans. This team will also bring a real-world operational perspective to the strategic planning process and the setting of program standards and targets in each location. The implementation team will be coordinated by Ms. Elisa Derby (Winrock International), who over the past decade has coordinated multiple market-based cookstove programs in Africa, including most recently leading the successful implementation of the World Bank's Biomass Energy Initiative Africa. The team also will include Katie Gross, who is currently managing a $3M USAID cookstove program in Kenya, and a small amount of participation from Norah Muthike of the Winrock International Nairobi, Kenya, office, if needed. Mr. Peter Scott (BURN Design) will contribute expertise on cookstove manufacturing in SSA, based on his many years of training and supporting stove design and production there.

In-country assessments will be led by Michael Johnson, who will spend some time in all three countries, particularly focusing on assessing the testing centers. Dr. Magi Matinga, an engineer and anthropologist with nearly two decades of experience in household energy interventions, will be part of the in-country data gathering team in Senegal and DRC. Mr. Joseph Ndemere (CIRCODU) will assist with in-country assessments in DRC and Uganda, where Dr. Morgan Defoort will also participate.

6 Timeline of Deliverables

Timeline	Dates	Milestone	Deliverable	Task
	28 May 2013	Contract Signing		
End of Month 1	25 June 2013		Inception Report	All
Mid-month 2	9 July 2013		Baseline assessment reports	1
End month 2			Tools for in-country activities	2
Begin month 3		Country visits being		2
End month 4		Country visits complete		2
End month 5	22 October 2013		Stove quality global testing method	2
End month 6		CSU performance testing completed		3
End month 6	12 November 2013		QA templates	4
End month 7		In-country performance testing completed		3
Mid-month 9	11 February 2014		ACCES Minimum quality standards & targets for each country	3
Mid-month 10	11 March 2014		Draft Strategy and Implementation Plan	All
End of month 11	22 April 2014		Technical support packages for testing centers & manufacturers	4
Middle of month 12	13 May 2014		Final strategy and Implementation Plan	All
End month 12	27 May 2014	Project close	Final presentation of work (PPT)	4

7 Annexes

7.1 Table of Key Personnel and Task Assignments

Name of Staff & Firm associated with[1]	Area of Expertise Relevant to the Assignment	Designation for this Assignment[2]	Assigned Tasks or Deliverables	Location[3]	Number of Days
Dana Charron, Berkeley Air	Cookstove project management	Lead	Project set-up and kick-off meeting; strategy and implementation plan; mid-project review meeting	USA	43
Michael Johnson, PhD, Berkeley Air	Cookstoves standards, emissions, field assessment	Technical Team lead	Field technical assessment in 1-2 countries; minimum quality standards and performance targets	USA	85
Morgan DeFoort, PhD, Colorado State University	Cookstove standards, laboratory evaluations of combustion, materials and durability	Technical Team expert	Field technical assessment in 1 country; testing methodology.	USA	58

[1] Indicate if the proposed staff is an employee or agent of your consulting firm/organization or a sub consultant.
[2] Title or position as described in the TOR or otherwise named in your proposed Organization and Staffing under Section D, sub section (c).
[3] Relative to the assignment subject of the Contract, indicate if the staff/consultant local or international.

Elisa Derby, Winrock International	Cookstove program design and implementation	Implementation Team lead	Baseline assessment reports; plan operationalization incl. technical support packages and QA agreement templates.	USA	25
Christian L'Orange, PhD, Colorado State University	Standardized stove testing for performance and durability.	Technical Team associate	Laboratory	USA	50
Katie Gross, Winrock International	Cookstove program design and implementation	Implementation Team associate	Baseline assessment reports; plan operationalization incl. technical support packages and QA agreement templates.	USA	20
Njirambo Margaret Matinga, independent consultant	Cookstove program research, design, implementation and monitoring	In-coutnry research	Baseline assessment in 1-3 countries	South Africa	45
Joseph Ndemere, CIRCODU	Ugandan cookstove industry, field stove performance testing	Technical and In-country research	Baseline assessment in 1-2 countries	Uganda	38

Peter Scott, BURN Design Lab and BURN Manufacturing Co.	Cookstove design and manufacturing	Manufacturing expert	Consult on assessment of manufacturing capacity and design of manufacturer TA	USA	10
Arne Jacobson, Humboldt State University	Product quality assurance (Lighting Africa); renewable energy technologies	Quality Assurance expert	Consult on lessons learned from Lighting Africa	USA	4

7.2 Curriculum Vitae (CV) of Proposed Key Personnel

1. **Name of Staff**: **Dana Kathleen Harmon Charron**

2. **Proposed Position:** Project Lead

3. **Employer**: Berkeley Air Monitoring Group, Inc.

4. **Date of Birth**: October 13, 1961 **Nationality**: USA

5. **Education**

School, college and/or University Attended	Degree/certificate or other specialized education obtained	Date Obtained
Haas School of Business, University of California, Berkeley.	MBA	May 1995
Wellesley College	BA, Political Science/Economics	May 1983

6. **Professional Certification or Membership in Professional Associations**: NA

7. **Other Relevant Training**: NA

8. **Countries of Work Experience**: Uganda, India, China

9. **Languages** [*For each language indicate proficiency: good, fair, or poor in speaking, reading, and writing*]:

English: native
French -- speaking: good; reading: good; writing: fair.
German -- speaking: fair; reading: good; writing: good.
Russian – speaking: poor; reading fair; writing: poor.
Spanish – speaking: poor; reading: fair; writing: poor.

10. **Employment Record** [*Starting with present position, list in reverse order every employment held*]:

From 2008 to Present

Employer: Berkeley Air Monitoring Group, Inc.

Positions held: Managing Director & Co-founder

From 2001 to 2008

Employer: University of California, Berkeley, School of Public Health

Positions held: Director for Household Energy and Health at the Center for Entrepreneurship in International Health and Development

From 1997 to 2001

Employer: Green America (then called "Co-op America")

Positions held: Woodwise Program Director

From 1995 to 1997

Employer: Wood Reduction Clearinghouse (subsidiary of Rainforest Action Network)

Positions held: Director

From 1990 to 1993

Employer: Greenpeace International

Positions held: Project manager (Antarctica)

From 1987 to 1990

Employer: Greenpeace USA

Positions held: Managing Editor

From 1983 to 1987

Employer: Advisory Board Company (then called "The Research Counsel")

Positions held: Vice President, Senior Associate, Associate

11. Detailed Tasks Assigned	**12. Work Undertaken that Best Illustrates Capability to Handle the Tasks Assigned**
Overall Project Lead: Organize contract and subcontracts; provide fiscal oversight and reporting; guide and communicate project framework and coordinate initial stakeholder consultations; country baseline reports; final recommendations on performance and program targets.	Name of assignment or project: Monitoring and Evaluation Working Group / Program Activity Year: 2011-12 Location: Global Client: Global Alliance for Clean Cookstoves Main project features: Building a consensus-based

	approach to monitoring and evaluation for the Global Alliance; writing section of strategic roadmap document. Positions held: Co-Chair, Consultant Activities performed: Identified and recruited participants, coordinated and facilitated international conference calls, drafted final roadmap document, coordinated three expert consultations, drafted briefing documents on monitoring and evaluation plan components. Name of assignment or project: Evaluation of Manufactured Wood Stoves in Dadaab Refugee Camps, Kenya Year: 2009-2010 Location: Kenya Client: USAID Main project features: Conduct field tests (CCTs) on 5 manufactured stoves at 3 UNHCR facilities in Northern Kenya. Positions held: Project supervisor Activities performed: Interfaced with client, coordinated subcontracting and reporting through USAID contractor; arranged Kenya logistics support and engaged local partners; procured test stoves; provided troubleshooting support to fieldworkers during testing; co-authored final report. Name of assignment or project: Development of Gold Standard Cookstove Carbon Project (Center for Entrepreneurship in International Health and Development) Year: 2005-2008 Location: Uganda Client: Climate Care & Ugastove Main project features: Worked with carbon finance company and Ugandan stove producer to create the systems and documentation necessary to achieve first ever Gold Standard registration of a cookstove project. Provided technical assistance to the manufacturer, coordinated local stakeholder consultation, and led

	contract negotiations among the parties. Positions held: Project manager Activities performed: Interfaced with client, coordinated subcontracting and reporting through USAID contractor; arranged Kenya logistics support and engaged local partners; procured test stoves; provided troubleshooting support to fieldworkers during testing; co-authored final report.

12. Do you currently or have you ever worked for the World Bank Group including any of the following types of appointments: Regular, term, ETC, ETT, STC, STT, JPA, or JPO? If yes, please provide details, including start/end dates of appointment.

Certification

I certify that (1) to the best of my knowledge and belief, this CV correctly describes me, my qualifications, and my experience; (2) that I am available for the assignment for which I am proposed; and (3) that I am proposed only by one Offeror and under one proposal.

I understand that any wilful misstatement or misrepresentation herein may lead to my disqualification or removal from the selected team undertaking the assignment.

Date: 11/Mar/2013

[Signature of staff member or authorized representative of the staff] *Day/Month/Year*

1. **Name of Staff**: **Michael Allen Johnson**

2. **Proposed Position**: Technical Team Lead

3. **Employer**: Berkeley Air Monitoring Group

4. **Date of Birth**: May 15, 1977 **Nationality**: United States of America
5. **Education**

School, college and/or University Attended	Degree/certificate or other specialized education obtained	Date Obtained
Colorado College	BA, Physics	1999
Oregon State University	MS, Science Educations	2002
University of California, Irvine	PhD, Environmental Health, Science, and Policy	2009

6. **Professional Certification or Membership in Professional Associations**:

• Core committee member to develop cookstove standards for ISO International Workshop Agreement (2011-2012)
• Convening author on chapter linking stove performance and indoor air quality, and co-author of chapter on household air pollution and health, for the forthcoming World Health Organization Indoor Air Quality Guidelines (2012-current)
Member of committee to develop "Water Boiling Test 4.1.2" for stove performance testing.
• Member of Standards and Testing Working Group for the Global Alliance for Clean Cookstoves.
• Member of Air and Waste Management Association.

7. **Other Relevant Training**:

8. **Countries of Work Experience**: [*List countries where staff has worked in the last ten years*]:

United States of America, Mexico, El Salvador, Peru, India, Kenya, Uganda, Rwanda, Mozambique, South Africa, Zambia, Malawi, and Cambodia.

9. **Languages** [*For each language indicate proficiency: good, fair, or poor in speaking, reading, and writing*]: English (fluent).

10. **Employment Record** [*Starting with present position, list in reverse order every employment held*]:
From 2010-Present
Employer: Berkeley Air Monitoring Group
Positions held: Senior Scientist

From 2009-2010
Employer: University of California, Irvine

Positions held: Research Associate

From: 2004-2009
Employer: University of California, Irvine
Positions held: Graduate Student Researcher

11. Detailed Tasks Assigned	**12. Work Undertaken that Best Illustrates Capability to Handle the Tasks Assigned**
- Coordinating the technical team	[*Among the assignments in which the staff has been involved, indicate the following information for those assignments that best illustrate staff capability to handle the tasks listed under point 11.*] Name of assignment or project: Stove Performance Inventory Year: 2012 Location: California, USA. Client: Global Alliance for Clean Cookstoves Main project features: Inventory of stove performance for landscaping cooking and heating technologies. Inventory is currently being adapted for a user-friendly Positions held: Lead/Supervisor Activities performed: Managed staff that conducted the literature reviews and inventory population. Conducted analysis on inventory data and generated report for the Global Alliance. Name of assignment or project: Cookstove Emissions Performance Survey Year: 2013 Location: Uganda, Kenya, Vietnam, TB. Client: Global Alliance for Clean Cookstoves Main project features: Conducing in home assessment of emissions for various stove types. Positions held: Principle Investigator Activities performed: Planning project implementation, conducted field training efforts, providing oversight for data collection, and will generate reports.

12. Do you currently or have you ever worked for the World Bank Group including any of the following types of appointments: Regular, term, ETC, ETT, STC, STT, JPA, or JPO? If yes, please provide details, including start/end dates of appointment.

Certification

I certify that (1) to the best of my knowledge and belief, this CV correctly describes me, my qualifications, and my experience; (2) that I am available for the assignment for which I am proposed; and (3) that I am proposed only by one Offeror and under one proposal.

I understand that any wilful misstatement or misrepresentation herein may lead to my disqualification or removal from the selected team undertaking the assignment.

Date: 11/03/2013

Signature of staff member or authorized representative of the staff] *Day/Month/Year*

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1. **Name of Staff**: **Morgan DeFoort**

2. **Proposed Position** Technical Expert

3. **Employer**: Colorado State University

4. **Date of Birth**: 06/25/1978 **Nationality**: United States

5. **Education**

School, college and/or University Attended	Degree/certificate or other specialized education obtained	Date Obtained
Hastings College	B.A. Physics	2000
Colorado State University	MS. Mechanical Engr.	2003
Colorado State University	PhD. Mechanical Engr.	2007

6. **Professional Certification or Membership in Professional Associations**: _____

7. **Other Relevant Training**:
- Committee member to develop cookstove standards for ISO International Workshop Agreement (2011-2012)
- Co-PI in the development of Global Alliance sponsored durability testing protocol development

8. **Countries of Work Experience**: [*List countries where staff has worked in the last ten years*]: Peru, India, China, Philippines_____

9. **Languages** [*For each language indicate proficiency: good, fair, or poor in speaking, reading, and writing*]: English, (native)_____

10. Employment Record [*Starting with present position, list in reverse order every employment held*]:
From [*Year*]: 2000 To [*Year*]: Current____

Employer: EECL at Colorado State University____

Positions held: Research Scientist, Co-Director____

11. Detailed Tasks Assigned	12. Work Undertaken that Best Illustrates Capability to Handle the Tasks Assigned
Technical Team Expert	[*Among the assignments in which the staff has been involved, indicate the following information for those assignments that best illustrate staff capability to handle the tasks listed under point 11.*] Name of assignment or project: Clean Cookstoves Program Year: 2008-Current Location: Fort Collins, CO (with field work in Peru, China, an India) Client: Envirofit International (funded by Shell Foundation) Main project features: Design of Cookstoves, Design of Stove Testing Lab, Development of Protocols, Development of Standards Positions held: Principle Investigator Activities performed: Project Management, R&D Management, Lab and Field Work

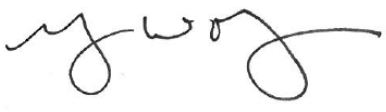
12. Do you currently or have you ever worked for the World Bank Group including any of the following types of appointments: Regular, term, ETC, ETT, STC, STT, JPA, or JPO? If yes, please provide details, including start/end dates of appointment.

No

Certification

I certify that (1) to the best of my knowledge and belief, this CV correctly describes me, my qualifications, and my experience; (2) that I am available for the assignment for which I am proposed; and (3) that I am proposed only by one Offeror and under one proposal.

I understand that any wilful misstatement or misrepresentation herein may lead to my disqualification or removal from the selected team undertaking the assignment.



_____ Date: _____

[Signature of staff member or authorized representative of the staff] *Day/Month/Year*

1. **Name of Staff**: **Elisa Derby**

2. **Proposed Position**: Outreach Team Lead

3. **Employer**: Winrock International

4. **Date of Birth**: November 15, 1974 **Nationality**: American

5. **Education**

School, college and/or University Attended	Degree/certificate or other specialized education obtained	Date Obtained
University of California, Berkeley	M.A. Energy and Resources	2001
Tufts University	B.A. Environmental Studies and Spanish	1996

6. **Professional Certification or Membership in Professional Associations**:

N/A

7. **Other Relevant Training**:

N/A

8. **Countries of Work Experience**: Bangladesh, Costa Rica, Guatemala, Honduras, Nepal, Peru, Uganda, and United States

9. **Languages:** English (native), Spanish (fluent), Portuguese (beginner)

10. **Employment Record**

From: 2003 **To**: present
Employer: Winrock International
Positions held: Senior Program Officer, Program Officer, Senior Program Associate & Program Associate

From: 2001 **To**: 2003
Employer: Airflow and Pollutant Transport Group, Indoor Environment Department Lawrence Berkeley National Laboratory
Positions held: Senior Research Associate

From: 1999 **To**: 2001
Employer: Energy Efficiency Standards Group/CLASP and Electricity Markets and Policy Group, Lawrence Berkeley National Laboratory
Positions held: Graduate Student Researcher

From: 1998 **To**: 1999
Employer: New Energy Ventures (NEV)
Positions held: Research Analyst and Customer Service Assistant

From: 1996 **To**: 1997
Employer: The School for Field Studies, Centro de Estudios sobre el Desarollo Sustenible
Positions held: Intern

11. Detailed Tasks Assigned	**12. Work Undertaken that Best Illustrates Capability to Handle the Tasks Assigned**
Lead Outreach Team, develop QA/TS implementation plan, design QA agreement templates, design and develop technical support packages	**Name of assignment or project:** Partnership for Clean Indoor Air Outreach and Coordination **Year:** 2003-2012 **Location:** Global **Client:** U.S. Environmental Protection Agency **Main project features:** Organizing and facilitating regional capacity-building workshops, webinars, Bulletins, technical assistance activities, and study tours. **Positions held:** Program Manager **Activities performed:** Compiled country landscape reports for cookstoves, coordinated and facilitated technical trainings for cookstove manufacturers, developed and published quarterly technical publications **Name of assignment or project:** WASHplus **Year:** 2010-present **Location:** Global **Client:** U.S. Agency for International Development (USAID), with FHI360 as prime **Main project features:** Delivering interventions that lead to improvements in water supply, sanitation, and hygiene (WASH) and indoor air pollution (IAP). **Positions held:** Household Energy/Indoor Air Pollution Specialist **Activities performed:** Provide technical assistance and strategic planning in indoor air pollution and household energy activities, represent USAID global cookstoves partnerships and initiatives, lead an improved cookstove (ICS) consumer needs, preferences and willingness to pay assessment in Bangladesh, coordinate improved cookstove performance field studies, develop technical training documents. **Name of assignment or project:** Biomass Energy

	Initiative for Africa (BEIA) **Year:** 2010-2012 **Location:** Sub-Saharan Africa **Client:** The World Bank **Main project features:** Administered, coordinated and supported the implementation of nine innovative pilot biomass energy projects throughout sub-Saharan Africa. **Positions held:** Project Coordinator/Pilots Administrator **Activities performed:** Provided administrative and technical guidance to grantees, oversaw pilot results monitoring and cookstove field performance assessments.

12. Do you currently or have you ever worked for the World Bank Group including any of the following types of appointments: Regular, term, ETC, ETT, STC, STT, JPA, or JPO? If yes, please provide details, including start/end dates of appointment.

N/A

Certification

I certify that (1) to the best of my knowledge and belief, this CV correctly describes me, my qualifications, and my experience; (2) that I am available for the assignment for which I am proposed; and (3) that I am proposed only by one Offeror and under one proposal.

I understand that any wilful misstatement or misrepresentation herein may lead to my disqualification or removal from the selected team undertaking the assignment.

[Signature of staff member or authorized representative of the staff]

Date: 11/3/13
Day/Month/Year

1. **Name of Staff**: **Christian Colin Per L'Orange**

2. **Proposed Position**
   Technical Team – WBT testing and training

3. **Employer**: Colorado State University

4. **Date of Birth**: June 13, 1985 **Nationality**: United States of America

5. **Education**

School, college and/or University Attended	Degree/certificate or other specialized education obtained	Date Obtained
Colorado State University	Bachelors of Science, Mechanical Engineering	May 2008
Colorado State University	Masters of Science, Mechanical Engineering	Aug 2009
Colorado State University	Doctor of Philosophy, Mechanical Engineering	To be Awarded May 2013

6. **Professional Certification or Membership in Professional Associations**:
   - Committee member to develop cookstove standards for ISO International Workshop Agreement (2011-2012)
   - Trainer in laboratory procedures and testing protocols
   - Key personnel in over 1600 hours of official EPTP/WBT tests and the evaluation of over 225 cookstove designs
   - Co-PI in the development of Global Alliance sponsored durability testing protocol development

7. **Other Relevant Training**:

8. **Countries of Work Experience**: [*List countries where staff has worked in the last ten years*]:
   India, Ethiopia

9. **Languages** [*For each language indicate proficiency: good, fair, or poor in speaking, reading, and writing*]:
   English (fluent)

10. Employment Record [*Starting with present position, list in reverse order every employment held*]:
From [*Year*]: 2006 To [*Year*]: Current

Employer: Colorado State University

Positions held: Undergraduate researcher, graduate research engineer____

11. Detailed Tasks Assigned	12. Work Undertaken that Best Illustrates Capability to Handle the Tasks Assigned
Expert consultation on standardized stove testing	[*Among the assignments in which the staff has been involved, indicate the following information for those assignments that best illustrate staff capability to handle the tasks listed under point 11.*] Name of assignment or project: Enhancing Markets and Institutional Capacity for Improved Cookstove Development and Promotion in Ethiopia Year: 2011 Location: Ethiopia (Oromia, Amahara, SNNP, and Tigray regions) Client: The Barr Foundation Main project features: Evaluation of cookstove technologies and lab testing capabilities Positions held: Technical Consultant Activities performed: Evaluation of current testing capacity, field evaluation of traditional and improved cookstoves, evaluation of producer capabilities, final report outlining findings and recommendations for the priorities when developing future projects

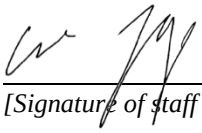
12. Do you currently or have you ever worked for the World Bank Group including any of the following types of appointments: Regular, term, ETC, ETT, STC, STT, JPA, or JPO? If yes, please provide details, including start/end dates of appointment.

No

Certification

I certify that (1) to the best of my knowledge and belief, this CV correctly describes me, my qualifications, and my experience; (2) that I am available for the assignment for which I am proposed; and (3) that I am proposed only by one Offeror and under one proposal.

I understand that any wilful misstatement or misrepresentation herein may lead to my disqualification or removal from the selected team undertaking the assignment.



Date: March 9, 2013

[Signature of staff member or authorized representative of the staff] *Day/Month/Year*

1. **Name of Staff**: **Margaret Njirambo Matinga**

2. **Proposed Position**: Outreach Team Associate

3. **Employer**: Independent Consultant

4. **Date of Birth**: September 11, 1977 **Nationality**: Malawian

5. **Education**

School, college and/or University Attended	Degree/certificate or other specialized education obtained	Date Obtained
University of Twente, The Netherlands	PhD, Energy and Health Anthropology	2010
University of Cape Town, South Africa	MSc Eng, Energy Studies	2004
University of Malawi, Malawi	BSc Mechanical Engineering	2001

6. **Professional Certification or Membership in Professional Associations**:

N/A

7. **Other Relevant Training**:

N/A

8. **Countries of Work Experience**: Cambodia, Malawi, Namibia, South Africa, Tanzania

9. **Languages:** English (fluent), Chichewa (fluent), Xhosa (fluent), French (basic), Dutch (basic)

10. **Employment Record**

From: 2012 **To**: 2013
Employer: UN Sustainable Energy for All (SE4All), UNDP Cambodia
Positions held: Independent Consultant

From: 2012 **To**: 2012
Employer: EU-Joint Research Centre (JRC)
Positions held: Visiting Researcher

From: 2012 **To**: 2012
Employer: World Bank, African Clean Cooking Initiative
Positions held: Short-term Consultant

From: 2012 **To**: 2012
Employer: Concern Universal, Household Energy Access
Positions held: Independent Consultant

From: 2012 **To**: 2012
Employer: NØrd/SØr, ENERGIA
Positions held: Consultant on behalf of NORAD's energy department

From: 2011 **To**: 2011
Employer: University of Johannesburg, Energy Technology and Research (SeTAR) Centre
Positions held: Research Fellow

From: 2005 **To**: 2009
Employer: University of Twente
Positions held: Lecturer

From: 2005 **To**: 2005
Employer: International Network on Gender and Sustainable Energy (ENERGIA)
Positions held: Principal Investigator

From: 2004 **To**: 2005
Employer: Eco Ltd.
Positions held: Consultant

From: 2001 **To**: 2005
Employer: African Research on Energy Policy Network (AFREPREN)
Positions held: Principal Investigator

From: 2004 **To**: 2004
Employer: Namibian Economic Policy Research Unit (NEPRU)
Positions held: Principal Investigator

From: 2004 **To**: 2004
Employer: Malawi Industrial Technology Research and Development Centre (MIRTDC)
Positions held: Engineer

From: 1998 **To**: 1998
Employer: UNDP
Positions held: Multi-disciplinary Research Team Lead

11. Detailed Tasks Assigned	**12. Work Undertaken that Best Illustrates Capability to Handle the Tasks Assigned**
Lead in-country data gathering and stakeholder consultations	**Name of assignment or project:** UN Sustainable Energy for All (SE4All) Gap Analysis **Year:** 2012-2013

	Location: Cambodia **Client:** UNDP Cambodia **Main project features:** Sustainable Energy For All is an initiative launched by the United Nations Secretary-General and guided by his High Level Group that brings all key actors to the table to make sustainable energy for all a reality by 2030. **Positions held:** Independent Consultant **Activities performed:** Responsible for the UN Sustainable Energy for All (SE4All) country gap analysis for Cambodia. Developing a readiness plan for implementing SE4All goals in Cambodia and providing input for priority areas in the Cambodia Climate Change Strategy Plan. Further responsible for stakeholder consultations to gain consensus on SE4All goals and strategies. **Name of assignment or project:** EU-Joint Research Centre (JRC) **Year:** 2012 **Location:** Italy **Client:** EU-Joint Research Centre **Main project features:** The European Commission's Joint Research Centre (JRC) is a department (Directorate-General, DG) of the European Commission providing independent scientific and technological support for EU policy-making. **Positions held:** Visiting Researcher **Activities performed:** Conducted research on convergences and divergences of stakeholder opinions on African energy challenges and solutions. The research used q-methodology. **Name of assignment or project:** UN Sustainable Energy for All (SE4All) Gap Analysis **Year:** 2012 **Location:** South Africa and Tanzania **Client:** UNDP Regional Service Centre **Main project features:** Sustainable Energy For All is an initiative launched by the United Nations Secretary-General and guided by his High Level Group that brings all key actors to the table to make sustainable energy for all a reality by 2030. **Positions held:** Independent Consultant **Activities performed:** Undertook a UN Sustainable Energy for All (SE4All) country gap analysis for South

	Africa and Tanzania. Produced a regional SE4All framework paper for East African economics and conducted stakeholder consultations for country action plans in South Africa. Participated in a high-level mission on SE4All to Tanzania. Prepared a policy brief of the SEAll goals and gaps for three regional economic commissions (West Africa, East Africa and Southern Africa) for a presentation at the Secretary General's meeting in September 2012. Developed a Rio+20 country position paper on the UN SE4All initiative for South Africa. **Name of assignment or project:** African Clean Cooking Initiative Assessment **Year:** 2012 **Location:** Sub-Saharan Africa **Client:** World Bank **Main project features:** To address Africa's long-standing energy challenge and build on new opportunities for transforming the cooking sector, the World Bank, under implementation by the Africa Energy Group (AFTEG), has launched the Africa Clean Cooking Energy Solutions (ACCES) initiative. The mission is to promote enterprise-based, large-scale dissemination and adoption of clean cooking solutions in Sub-Saharan Africa (SSA). By increasing access to modern technologies and cleaner fuels, the initiative seeks to alleviate the adverse health, environment, and socio-economic impacts of traditional cooking practices in SSA. **Positions held:** Short-term Consultant **Activities performed:** Designed the World Bank's clean cooking strategy for sub-Sahara Africa. Provided monitoring support and technical advice on landscape studies and other inputs commissioned by the World Bank to assess the state of clean cooking in sub-Sahara Africa. Designed the clean cooking strategy components related to quality and standards, consumer engagement, and policy and regulation. Also provided advisory support on gender mainstreaming, fuels and knowledge management components. **Name of assignment or project:** Household Energy Access **Year:** 2012 **Location:** Malawi **Client:** Concern Universal

	Main project features: Concern Universal is an international development organisation tackling poverty from the grassroots. They create opportunities for people around the world to improve their lives and shape their own futures. By building skills and connecting people at all levels in society, they help communities deliver practical solutions with long term impact. **Positions held:** Independent Consultant **Activities performed:** Designed, led and executed research on socio-cultural acceptability and market barriers of improved cookstoves in three districts in Malawi, focusing on gender aspects. Advised on policy for government, donors, and non-state actors.

12. Do you currently or have you ever worked for the World Bank Group including any of the following types of appointments: Regular, term, ETC, ETT, STC, STT, JPA, or JPO? If yes, please provide details, including start/end dates of appointment.

Yes: Short-term Consultant, African Clean Cooking Initiative, May 2012 to August 2012

Certification

I certify that (1) to the best of my knowledge and belief, this CV correctly describes me, my qualifications, and my experience; (2) that I am available for the assignment for which I am proposed; and (3) that I am proposed only by one Offeror and under one proposal.

I understand that any wilful misstatement or misrepresentation herein may lead to my disqualification or removal from the selected team undertaking the assignment.

Received via email on 06 March 2013 Date: 6/3/13

[Signature of staff member or authorized representative of the staff] *Day/Month/Year*

7.3 Terms of Reference

Terms of Reference

for

African Clean Cooking Energy Solutions Quality Assurance and Technical Support Program

1. Background

Africa Clean Cooking Energy Solutions (ACCES) is a World Bank initiative to promote enterprise-based, large-scale dissemination and adoption of clean solutions in Sub-Sahara Africa (SSA). By increasing access to modern technologies and cleaner fuels, the initiative seeks to alleviate the adverse health, environment, and socio-economic impacts of traditional cooking practices in SSA. ACCES' vision is to scale-up clean cooking and fuel technologies through a consultative, integrated, enterprise-based approach to regional development. This new initiative builds on experiences and lessons learned from donor, government, public and private investments in clean cooking solutions and the World Bank's own operations, comprehensive analytical work, as well as the Lighting Africa off-grid lighting market-transformation program.

ACCES seeks a consultative approach to its engagement in the clean cooking sector guided by the following key principles:

- Catalyzing sector development through promotion of enterprise-based approaches
- Promoting differentiated strategies to make clean fuels and cooking technologies accessible and affordable
- Maintaining a cooking technology and fuel neutral platform, promoting efficient biomass stoves while supporting the transition to clean fuels
- Integrating gender considerations into clean cooking strategies and interventions
- Aligning with and build on existing country strategies, programs and partnerships

Together, the World Bank's Africa Energy Group (AFTEG) and the Energy Sector Management Assistance Program (ESMAP) will work to implement ACCES in close coordination and through a strategic partnership with the Global Alliance for Clean Cookstoves (the Alliance).

The Alliance is undertaking targeted work in several areas related to quality, testing and standards, and all work done through the World Bank ACCES QA/TS program will be done in close coordination with The

Alliance. At present, The Alliance is coordinating the development of multi-tier technical standards to evaluate and communicate results on performance of cooking solutions (including cookstoves and fuels), in partnership with WHO and ISO. The Alliance is also working through the ISO processes to develop cooking-solution standards based on the WHO health guidelines and research on environmental and livelihoods impacts. All work regarding benchmarking quality of stoves and fuels will be done considering The Alliance work on the multi-tiered standards. In addition, the Alliance is building the capacity of regional testing centers throughout Africa with targeted grants to support staff, purchase of equipment, trainings, marketing and other requirements. The World Bank ACCES program will leverage work being done by the Alliance with regional testing centers in Senegal and Uganda.

Based on the regional Stakeholder Consultations and Landscape Analysis, ACCES developed an open, adaptable framework of support comprised of five pillars, each with the objective of targeting a specific, unmet need in the clean cooking landscape in SSA. The ACCES five pillar framework embodies a comprehensive, integrated approach to address key barriers to sector development targeting *consumers, enterprises, technology, and policy*.

Supporting Pillars

- **Quality Assurance and Technical Support**: Establishing quality specifications and developing testing methodologies to promote the manufacturing and distribution of clean, affordable, quality products.
- **Consumer Engagement**: Engaging consumer in design and product development and educating consumers on cleaner fuels and appliances;
- **Business Development**: Building and training MSME capacity, and assisting manufacturers and distributors in achieving their business goals and supporting new business models
- **Access to Finance**: Identifying pipeline for investments, consumer financing, capacity building for financial intermediaries (banks, MFIs)
- **Policy Engagement**: Identifying policy barriers that they are hampering the scale-up of clean cooking solutions, including issues related to customs duties, environment taxes, etc.

In addition, **Knowledge Management** encapsulates various knowledge generation, dissemination, communications and knowledge exchange activities specifically related to the pillars as well as those undertaken for broad sector engagement.

The ACCES Quality Assurance/Technical Support (QA/TS) pillar:

This ToR refers specifically to the QA/TS pillar within the ACCES framework. Building off World Bank analysis and stakeholder consultations in SSA, the ACCES program has identified key barriers in the area of quality, manufacturing and standards in the region.

For manufacturers, some of key challenges are:

a) Lack of incentives for manufacturers to undertake stove and / or fuel testing

b) Insufficient incentives to improve production and quality of stoves and fuels

c) Lack of certified testing centers to conduct stove/fuel testing and limited in-country capacity to undertake stove and fuel testing including equipment and skills, and for laboratory- and field-based testing

d) Prohibitively high costs of testing limits number of manufacturers with ability to test

e) Lack of national standards and norms on quality for stoves and fuels, and limited enforcement capacity

For consumers and stove promoters, some of these key challenges are:

a) Lack of sufficient information and branding for consumers to differential between high and low performing stoves and fuels

b) Lack of available high-quality, low-cost products available

c) Market spoilage, due to inconsistent testing and branding of stoves

The QA/TS pillar of the ACCES program will work together with other stakeholders to help address some of these key gaps. The successful firm will design the ACCES QA/TS program to ameliorate these challenges.

2. Objective of the Assignment

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The objective of this assignment is the first phase of a two-phase process to build an ACCES QA program for clean cooking solutions in Africa, and develop ways to link a technical support component to the QA program in order to improve the product quality and production capacity of manufacturers in Sub-Saharan Africa.

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3. Regional Scope: Initial Countries of Engagement

The firm will be responsible for the overall design of the QA/TS pillar and will develop an overarching framework for a QA program across Sub-Saharan Africa (SSA), while customizing support as relevant to individual countries. Additionally, the firm will be responsible for working with international organizations and in the context of bourgeoning international stove testing standards to develop a regional QA program for all of SSA. In the first year the firm will work closely with ACCES's first three countries of initial engagement, Senegal, Uganda, and DRC. Additional countries may be added in a later phase. Specific activities in initial countries of engagement follow.

Senegal: The World Bank has identified Senegal as an important market for clean cooking solutions and products considering the 94% of the rural population dependent on solid fuels such as charcoal, dung, fuelwood, and coal for cooking purpose. The landscape in Senegal is currently characterized by small-scale artisanal producers of charcoal and wood stoves, few semi-industrial producers, and low availability of improved fuels. The testing capacity in Senegal is limited, but work is being done though The Alliance to build the capacity of the testing center, CERER, to provide testing services to the region. A committee of stakeholders is working with the regional testing centers to build out fuel standards and norms (already

9 existing now), to revise the Jumbar stove standards (already exist now, but they are voluntary) and facilitate the creation of new national stove standards. The ACCES QA/TS program will prioritize activities that will focus on increasing manufacturing capacity and stove / fuel quality of artisans and local as well as international manufacturers in the Senegal market

Uganda: As one of the most fuel-stressed countries in Sub-Saharan Africa, World Bank ACCES interventions will work together with local stakeholders to target fuel-stressed regions. Uganda has several semi-industrial producers of charcoal stoves, including award winning Ugastove and NGO International Lifeline Fund (ILF), among others. Uganda Carbon Bureau has developed a PoA encompassing many of the stoves distributed across Uganda, and expects to complete registration process soon, with the hope to aid stove manufacturers in subsidizing stove prices to end-users through carbon financing. The Alliance-supported regional testing center, CREEC, is increasing the volume of stoves it can test and the type of testing it is able to conduct. UNACC and UNBS are beginning discussions with the National Standards Setting Body to revise national standards for stoves and fuels. ACCES QA/TS work will coordinate with national activities to build a QA program to leverage current capacity and help to increase incentives for manufacturers to undertake stove / fuel testing.

Democratic Republic of the Congo DRC: Deforestation in DRC is prevalent, and current World Bank activities focus on reforestation and livelihood activities. With the majority of the population of DRC in rural areas reliant on fuelwood for cooking, the ACCES program will develop targeted activities to introduce improved stoves that focus on fuel efficiency. ACCES will provide support to World Bank's Forest Investment Project (FIP) team in preparing the project activities on production and adoption of improved cookstoves in and around the Kinshasa area and develop interventions that are in line with the ACCES framework and engagement in the region. Among other activities, ACCES will be exploring coordination of efforts on QA/TS support development and harmonization of standards. The scope of all activities conducted in the DRC will be limited to in and around the Kinshasa area.

4. Scope of Work and General Tasks

One or more firms may decide to work together in partnership to undertake the following scope of work. The firm or firms will be charged with building the ACCES platform's QA program, and designing technical support packages for manufacturers and testing centers to support this QA program. The firm or firms will undertake targeted activities to help address identified gaps and design a strong, scalable QA program. These general tasks will include:

1) **Rapid assessment of knowledge, capacity, and investment gaps in standards, testing, quality assurance, and technology development efforts for stoves**

2) **Develop the ACCES tiered QA system that is consistent with international standards and certifications for stoves and basic fuel production technologies**

3) **Benchmarking to decide in-country standards for World Bank ACCES support**

4) **Design and develop packages of support for manufacturers and testing sites**

5. Specific Tasks

In the first phase, year 1, the firm is expected to perform the following specific tasks:

1) **Rapid assessment of knowledge, capacity, and investment gaps in standards, testing, quality assurance, and technology development efforts for stoves.** The firm will be responsible for undertaking baseline assessments of quality, standards, testing and manufacturing capacity to fill existing knowledge gaps in each of the initial countries of engagement. This may include field based testing, assessments of durability, consumer perceptions of durability, identifying testing centers, and quality assessment of manufacturing materials and processes by country.

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2) **Develop the ACCES tiered QA system that is consistent with international standards and certifications for stoves and fuel production technologies.** The firm will be responsible for designing and building an ACCES QA program for clean cooking solutions in Sub-Saharan Africa, contextualizing the program for ACCES' three initial countries of engagement: Senegal, Uganda and DRC. Specific tasks will include definition of protocols to be used in ACCES QA testing centers, coordination with international and local standards setting bodies, coordination with the Alliance and Alliance-supported regional testing centers, coordination with primary manufacturers, and design of a multi-year strategy for operationalizing the program.
3) **Benchmarking to decide in-country standards for World Bank ACCES support.** Within the tiered QA program, the firm will be responsible for benchmarking stove performance standards that products / manufacturers must meet in order to quality for ACCES support. Specific tasks will involve:

    i. Setting country-specific performance targets for World Bank support/funding;
    ii. Contextualizing targets for World Bank support within the relevant national and international standards and norms.

4) **Design and develop packages of support for manufacturers and testing sites.** These technical support packages will offer technical assistance and funding linked to and designed to improve manufacturer quality, product quality, and production capacity. They will also be available to testing centers to improve capacity, including both quantity and quality of testing. The design of the technical support package should:

    i. Employ a tiered approach to measuring the technical quality of a product and, where possible, measurable targets to facilitate progress of any one stove product within the tiered design;
    ii. Develop types of technical assistance needed for manufacturers to increase the quality of their product and /or standardization of their manufacturing;
    iii. Harmonize with commitments and incentives linked to support under ACCES Business Development and Access to Finance pillars and tailored to needs and capacity. Designing a multi-year plan for linking technical support to QA and develop a plan for operationalizing the technical support program;

iv. Develop a plan for the provision of necessary support to testing centers

6. Outputs and Deliverables

Documents to be produced

- Baseline assessments of quality and manufacturing, testing and standards landscape in Senegal, Uganda and DRC
- Strategy and Implementation Plan for QA/TS across SSA informed by initial assessments
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- Stove quality global testing methodology for World Bank QA program including (see Lighting Africa QTM and ISM):
    - A defined Quality Test Method (QTM) that encompasses performance (efficiency and emissions), safety and field assessment (to the extent doable in phase one)
    - Stove and fuel specifications
- ACCES country-specific Minimum Quality Standards and Recommended Performance Targets document
    - Minimum standards for the ACCES program
    - Targets linked to TA
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- Templates of QA agreements between:
    - Manufacturers and testing centres
    - ACCES and testing centers
    - ACCES and manufacturers
- Technical Support Packages: documents that detail the technical support packages and describe their linkages to quality targets

Standards to be Defined

- Minimum Specifications of ACCES Approved improved stoves by country
- Quality Benchmarks for each tier of quality framework and linkages to technical assistance

Targets

The firm will set targets and Key performance indicators in the following areas:

- Quantity of manufacturers to include in technical support program
- Number of products (stoves and or fuels) to improve through technical support program
- Amount of total technical support provided to manufacturers, by stove type and country
- Quantity of stoves to test under QA program, by region and country
- Number of new testing centers to train to preform tests for ACCES QA program
- Number of total qualified testing centers that have signed agreements with World Bank ACCES QA program

7. Firm's Responsibilities

All final reports and primary data will be submitted in an electronic format that is compatible with/ easily convertible to standard software applications for statistics, and spread sheets and presentation software (excluding any PDF type files which cannot be further edited by the project).

Within two week after receiving comments from ACCES, the Consultant will complete the reports and re-submit the final reports to the ACCES project manager.

8. The ACCES Team's responsibilities:

The ACCES team will stay engaged in the development of the QA/TS process, and will provide strategic support to the firm, including:

- Facilitating connections with the World Bank teams and development partners in each of the three initial countries of engagement, including attending meetings, continued dialogue with clients to discuss QA/TS program, and additional stakeholder consultations, as needed
- Continued dialogue with regional testing centers in Uganda, Senegal and DRC, and coordination with international trainings
- Providing support to link firms conducting market analysis and fuel landscape analysis with QA firm to leverage and coordinate the work of all
- Providing feedback on workplan, draft report, tool development, etc.

9. Qualifications and Experience

The project staff:

Project Lead:
Have at least 10 years of experience in the clean cooking sector, with at least 5 years of experience related to testing and quality of stoves and fuels.

Other staff:
Fluency in French
Expertise in conducting WBTs
Proven ability to conduct trainings

The firm must have:

- Demonstrable experience in the provision of technical assistance to stove manufacturers in developing countries, preferably in Africa;
- Demonstrable experience in carrying out similar improved stove and fuel quality and testing in developing countries, preferably in Africa;
- Demonstrable experience in the establishment of clean cooking sector partnerships and past experience working with the Alliance and the Alliance-supported regional testing centers;

- Demonstrable experience working with global standards and norm setting for improved cookstoves and improved fuels;
- Demonstrable experience in implementation of donor supported projects;
- Proven record of arranging partnerships with international organizations for work in the clean cooking sector.

10. Duration of the contract and level of effort

The contract is for 12 months (March, 2013 – April, 2014), and all deliverables are expected to be submitted to the Client by Septe,mber 30th, 2014.

The estimated level of effort is about 40 person days per month for 12 months. Consulting firms are requested to present, in their technical proposal, a level of effort chart showing their expected chronogram and time allocation for the development of each of the deliverables and any assumptions made regarding the level of effort for each of the deliverables and the scope of work to be performed.

11. Payment Schedule

The contract shall be paid in installments as follows:

Activity	Output	Timing	Payment	Total
Contract Signing / Mobilization	Signed Contract	**0 weeks**	**10%**	**10%**
Inception report		**4 weeks**	**10%**	**20%**
Baseline Assessments	Quality and Manufacturing Baseline Assessments to fill any knowledge gaps in initial countries of engagement	**6 weeks after signing**	**10%**	**30%**
Stove Quality Testing Methodology for QA program	A comprehensive methodology for testing stoves and fuels under the WB ACCES QA/TS program, including a QTM, ACCES benchmarks, country targets, and stove/fuel specifications. Creation of ACCES QA Minimum quality standards and performance targets.	**Tools for in country activities: 8 weeks after signing**	**10%**	**40%**
		Final: 21 weeks after signing	**15%**	**55%**
QA Templates	Templates for agreements with manufacturers	**25 weeks after signing**		
Minimum quality standards and benchmarks	Develop in country minimum quality standards and benchmarks	**37 weeks after signing**	**15%**	**70%**
Draft Strategy and Implementation Plan for QA/TS Program	Strategy and Implementation plan for the proposed structure of the World Bank QA/TS program across SSA	**41 weeks after signing**		
Build technical support packages	Design technical support packages and linkages to other ACCES pillars (access to finance and business development)	**47 weeks after signing**	**20%**	**90%**
Final Strategy and Implementation Plan for QA/TS Program	Strategy and Implementation plan for the proposed structure of the World Bank QA/TS program across SSA	**50 weeks after signing**		
Final Presentation of work and findings		**1 year after signing**	**10%**	**100%**