**NAMAs Proposal – NAMA Seeking Support for Preparation**

**1.0. Title of Mitigation Action**

The Promotion of the Use of Efficient Institutional Stoves in Educational Institutions

**2.0. Description of the Mitigation Action**

This NAMA intends to reduce emissions through the promotion of the use of improved energy efficient cook stoves in educational institutions at all levels in the different regions of Uganda. Greenhouse gas (GHG) emissions will be reduced because the efficient cookstoves require less woodfuel (up to 50%) to generate the same amount of energy required for cooking as ordinary three stone cookstoves.

The promotion of energy efficient cookstoves will be achieved first by sensitising the main stakeholder, who are the Ministry of Education and Sports, to encourage the development of a policy instrument that ensures all educational institutions (EIs) in the country use energy efficient stoves. This policy instrument could include incentives in form of grants and loans for compliance. Sensitisation will then be directed towards district staff including the District Education Officer, the District Inspector of Schools, headteachers, teachers, school management committees and parents on the importance of mitigating GHGs through the use of energy efficient stoves.

A database of schools and their energy status will be made and subsequently updated on a regular basis. From this database beneficiary educational institutions will be selected based on particular criteria that will include number of pupils, energy status, financial status and willingness to pay. The EIs will be divided into five groups corresponding to the intended year of installation. The first group of EIs will then be assisted to apply for subsidies and loans from microfinance institutions (MFIs) depending on their need. The intent is to provide a subsidy for half the cost, and a loan for the remainder. The loans will be provided through a revolving fund, which will introduce an element of sustainability to the initiative. An amount of money will be available as a loan facility to the EIs through an MFI depending on their needs. This amount will enable the EIs to purchase the required number of stoves from manufacturers or their dealers, who will then be responsible for supplying and maintaining them. Manufacturers or their dealers will sign an installation and maintenance contract. The EIs will start repaying the loan after purchasing and installing these stoves and complete repayment should be between 6 and 9 months. This amount will then be available to the next group of EIs and thus become revolving.

The NAMA will also support the development of a sustainable stove industry by providing entrepreneurs including technicians and artisans with loans through microfinance institutions to improve their businesses or start up new businesses. This loan facility will be accompanied with both technical skills in the manufacture and maintenance of stoves and financial and business skills in small and medium enterprise (SME) management. The NAMA will provide funds to MFIs and build capacity to develop appropriate business models for stove manufacturers.

In order to assure the quality of stoves being produced, this NAMA will support the development of an appropriate standard for institutional stoves with Uganda National Bureau of Standards.

The types of stove to be promoted include mainly the rocket stove (Adkins *et al*, 2010) which can reduce fuelwood consumption by 33% and other appropriate models.

Greenhouse gases covered by the mitigation action - the NAMA will avoid emissions of CO2 because of more efficient combustion in the improved institutional stove, compared to the BAU scenario. More heat energy will be produced per kilogram of woodfuel, which means less woodfuel would be required for the same cooking activity. This would mean less woodfuel would be used and thus fewer emissions would be generated.

**3.0. National Implementing Agency**

The Ministry of Energy and Mineral Development (MEMD) will be the lead agency because the NAMA is primarily an Energy sector intervention. A coordination office will be established at the Ministry headquarters under the Commissioner Energy Resources Department led by the Project Coordinator MEMD. This Coordination office will liaise with a *designated officer* under the Commissioner Educational Planning in the Ministry of Education and Sports (MOES) headquarters. This designated officer will act as the Coordinator MOES. The Coordinator MOES will work closely with the Assistant Commissioner Construction Management Unit (CMU) MOES who will nominate a technical officer to be responsible for the project. The Coordinator MOES will also liaise directly with District staff led by the District Education Officers (DEO).

The DEO would identify candidate educational institutions that need support as well as an appropriate district-based NGO to carry out the sensitization. The selection of the institution would be based on the specific criteria mentioned above. The Uganda National Bureau of Standards will develop standards for institutional stoves. Stove manufacturers will manufacture and install the stoves, while microfinance institutions will provide financial products and business models for the educational institutions.

Below is a description of the key roles of the main stakeholders under this NAMA.

1. **MEMD**
2. To conduct overall coordination of programme
3. To liaise with other stakeholders including donors
4. To develop workplans and requisition for funds
5. To monitor the progress of implementation
6. To disburse funds to the key stakeholders
7. To prepare financial reports and audits
8. To conduct sensitization of stakeholders with assistance of NGOs
9. To conduct quarterly progress meetings
10. To prepare quarterly monitoring reports including emissions reduction
11. **MOES**
12. To develop a policy to promote the use of energy efficient cookstoves
13. To conduct a baseline survey on energy in EIs
14. To identify the EIs to be attended to
15. To liaise with the District Education Staff, District Inspector of Schools, Headteachers, teachers and school management committees
16. **District Education staff**
17. To identify suitable NGOs
18. To monitor the implementation of the programme with the MOES CMU
19. To provide quarterly reports
20. **Uganda National Bureau of Standards**
21. To conduct research on existing standards
22. To test the performance of institutional cookstoves
23. To develop appropriate standards with international certification
24. To monitor the construction and installation
25. **NGOs**
26. To develop appropriate materials for different stakeholders
27. To conduct sensitization workshops for MOES staff, District staff, School Staff including school management committees.
28. To provide training to artisans, technicians and on both the technical aspects of stove installation and maintenance and the financial and managerial aspects of developing stoves businesses
29. **Stove Manufacturers**
30. To manufacture, install and maintain the institutional cookstoves
31. To receive loans for business development from microfinance institutions
32. To receive technical and business skills from NGOs
33. **Microfinance Institutions**
34. To develop appropriate financial products and business models for the Educational institutions, the stove manufacturers.
35. To disburse funds and ensure repayments
36. To monitor the use of the funds and the repayments.

**Proposed activities of the NAMA**

The NAMA intends to create an increased demand for institutional stoves for educational institutions through a series of activities designed to increase both demand and supply of efficient cookstoves. Initial activities will include developing accurate data and information on the cookstoves used in educational institutions, and the number of meals prepared in these institutions. As well, cookstoves will be tested to determine the efficiency of current stoves, as well as more efficient stoves promoted through the NAMA. This work could be undertaken in conjunction with the Uganda National Bureau of Standards, to assist them in developing standards for energy efficient institutional cookstoves and for Indoor Air Pollution. By subsidizing testing costs, the NAMA will help to develop standards and provide a baseline to measure and improve the quality of stoves in the market.

The demand for cookstoves will be addressed in two ways. Firstly, The NAMA will address the limited access to financing providing a subsidy for 50% of the cookstove cost, and by setting up a revolving fund to make short-term loans available for the remainder of the cost. These loans will be guaranteed through the project, and repayment structured in a way to allow educational institutions to use savings on woodfuel costs to pay the loan, thus making the loan repayment affordable. Secondly, an awareness raising campaign will explain and demonstrate the benefits of using improved cookstoves to the key stakeholders, which are the Ministry of Education and Sports, district local governments, head teachers, school management committees and communities.

Improving the supply would be addressed by increasing capacity to manufacture institutional stoves locally. The increased capacity to manufacture stoves will be created firstly, by providing technical support to the small entrepreneurs or artisans, which would include both technical and financial skills. Secondly, the NAMA will provide financial support through loans through finance institutions for the start up or improvement of businesses in the manufacture of stoves, The NAMA would also help to offset the high costs of distribution and improve distribution channels, and assist manufacturers in developing programmes of after-sales service.

The key activities of the NAMA are thus:

* Baseline surveys
* Developing of standards for the *Institutional Stoves* and *Indoor Air Pollution*
* Sensitization of key stakeholders
* Capacity building of artisans and manufacturers, including improving and setting up of manufacturing facilities, and establishing distribution channels
* Provision of subsidies and loans through microfinance institutions

The NAMA will support the creation of a sustainable stove industry, first by sensitising stakeholders about institutional stoves, which is *knowledge and awareness creation to increase demand*. This would be followed by supporting stakeholders to *increase the production of institutional stoves* through the *availability of finance and capacity building* to sustain supply. Demand will be encouraged through subsidies and loans.

The NAMA could be piloted by implementing by selecting two districts in the each of the four regions of Uganda, since it is a national programme. The selection of the pilot districts will be done after consultation with the other stakeholders including the National Planning Authority. The NAMA will target 10% of the target population, which is 750,000 students. The Implementation Plan is shown in Table 1

**Table 1 Proposed Implementation Plan**

|  |  |
| --- | --- |
| Activities | Timeline in months |
|  | 6 | 12 | 18 | 24 | 30 | 36 | 42 | 48 | 54 | 60 |
| Baseline Surveys |  |  |  |  |  |  |  |  |  |  |
| Developing Standards for Institutional Stoves and Indoor Air Pollution |  |  |  |  |  |  |  |  |  |  |
| Sensitisation of Key Stakeholders |  |  |  |  |  |  |  |  |  |  |
| Capacity building of artisans and manufacturers, including improving and setting up of manufacturing facilities, and establishing distribution channels |  |  |  |  |  |  |  |  |  |  |
| Provision of subsidies and loans through microfinance institutions |  |  |  |  |  |  |  |  |  |  |

**4.0 Expected Time Frame for the Preparation of the Mitigation Action**

6 months

**5.0 Estimated Full Costs of Preparation**

* Background and feasibility studies : US$ 100,000
* Technical assessments and designs: US$ 40,000
* Consultations with stakeholders : US$ 20,000
* Work plans, including specific activities and elements: US$ 10,000
* Capacity Building: US$ 30,000

**6.0. Support Required for Preparing the Mitigation Action**

***6.1. Financial Support***

**US$ 200,000**

Total amount of financial resources that are needed to prepare the NAMA, and indicate that grant funds are needed.

***6.2. Capacity Building Support***

An amount of US$30,000 is included in the overall budget

**7.0 Outcomes of NAMAs**

***Reduction in GHG emissions***

The reduction in CO2 and Non CO2 emissions reduction was calculated based on the *Gold Standard Methodology* and is expected be as follows: Year 1: 10% = 11120 tCO2e

 Year 2: 25% = 27810tCO2e

 Year 3: 45% = 50050 tCO2e

 Year 4: 70% = 77860tCO2e

 Year 5: 100%= **111230 tCO2e**

*(If the default per capita consumption is 0.5 tonnes per capita per year is used the emissions reduction become* **60,950 tCO2e** *a year at the end of 5 years)*

These will be measured by:

* GHG emissions reductions as a result of reduced fuelwood use in efficient stoves from baseline
* Fraction of biomass used in year for baseline scenario that is non-renewable
* CO2 emission factor for fuelwood based on 2006 IPCC guidelines for CO2, methane and nitrous oxide emissions from wood combusted in wood stoves

The *Gold Standard* was preferred because it takes into account non-CO2 emissions as well (Lee *et al*, 2013).

***Monitoring Reporting and Verification***

The purpose of Monitoring Reporting and Verification (MRV) is to ensure that the NAMA contributes positively to the key objectives and is both cost-effective and accountable.

The monitoring of the reduction in GHGs will follow the Gold Standard requirements as well as inputs from derived from a Stakeholders Workshop in June 2014. Table 2 provides an overview of the key objectives and a brief summary of the data needs for MRV.

**Table 2: Proposed MRV framework for Institutional Stoves NAMA**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Indicators** | **Emissions factors/****Activity data** | **Data Owners**  | **Information** | **Institution Responsible for collecting Information** | **Procedure** | **Reporting** | **Verification**  | **Leadership** |
| Tonnes of biomass generated/consumed | Biomass use (tonnes) | MEMD (REA), MOES NFA,Utilities,Electric generation companies,Solar companies,Large informal sector,UBOS | Functioning of cook stovesChange in use of biomass (tonnes, costs saved) Propose technology standardsData on the capacity of stoves installed, performance records of all stoves at the point of installation  | SchoolsSchools report to MEMD (EE division), MOESUNBSPrivate Sector (Renewable Energy Associations) – Cook stove providers report to MEMD | Measurement done on a periodic basis by data providers (sometimes in response to requests or for publications) | MEMD aggregates data on a periodic basis (sometimes in response to requests) | MEMD Planning Unit goes to verify what is reportedMOES to verify impacts/co-benefits of NAMAQA/QC by GHG INV team; NEMA to do Environmental Impact Assessments/external regulatory authority (to check emissions profile of energy suppliers) External auditor as 3rd party verifier  | MEMD |
|  |  |  | MEMD influences MOES on cook stoves policyMOES influences Local GovernmentEducation Officers | MEMDDistrictLocal Governments |  |
|  |
| **Resources, capacities, staff** | Have staff but need capacities enhanced & financing to conduct energy GHG inventory on an annual basis. Other recommendations are: - level of autonomy (independent institution) - ensure regulations that require involvement of data providers to Ministry (as incentive to be responsible)  |
| **Long-term costs** | National budget allocation that is sufficient for the purpose of data collection, compilation and analysis |

**Co- benefits for local sustainable development**

The NAMA will result in significant co-benefits, categorized below using the three pillars of sustainable development: economic, social and environmental impacts. Co-benefits will be accounted for using a qualitative assessment, with a full proposal examining what statistics are readily available to measure and monitor sustainable development impacts.

***Economic Impacts***

* Income- and employment-generating effects through the improvement of existing businesses and the promotion of new businesses.
* Reduced money spent on fuelwood, freeing up financial resources for tuition, clothes, books, food, tools and equipment.

***Social Impacts***

* Improved working conditions and health status of the cooks
* Reduced indoor air pollution and associated respiratory illness
* Less pain and physical stress caused by smoke, intense heat, burns and accidents
* Reduced cooking time because of more efficient stoves means more time is available for other useful activities such as farming, food processing
* Improved nutrition of pupils, small children and adults due to more and better meals
* Acquisition of new skills and knowledge through capacity building and awareness creation
* Increased environmental awareness through good practices; students will be agents of change in their homesteads since they will observe the impact of use of improved stoves in their schools.
* The substantial savings realized as a result of using the improved cookstoves by the selected beneficiary schools will encourage other neighbouring schools to resort to the improved cookstoves as well.

***Environmental Impact***

* Reduced deforestation leading to protection of water, flora and fauna and maintaining the biodiversity due to preserved forest cover
* Microfinance institutions will create new business models which can be replicated in future technology promotion initiatives

**8.0. Links to National Policies and Other NAMAs**

**8.1. Links to National Development Plan:**

This intervention responds to two objectives in the Energy sector, which is considered one of the Complementary Sectors in the National Development Plan:

* *Objective 4* - *Promotion of Energy Efficiency.* The combustion of woodfuel is more efficient in modern institutional stoves than in traditional three stone stoves.
* *Objective 6 - Promotion of Renewable Energy*. The institutional stove is a modern renewable energy technology.

This NAMA is consistent with the overall goal of the *Renewable Energy Policy* (2007) which is to increase the use of modern renewable energy from 4% to 61%. It addresses the sustainable use of biomass as an objective in the Renewable Energy Policy.

**8.2. Links to Climate Change Policy:** The NAMA supports *Policy Priority No 9* in the Climate Change Policy (2013), which seeks to *promote sustainable energy access and utilisation as a means of sustainable development in the face of uncertainties related to climate change*. The NAMA also promotes the use of energy efficient cookstoves, which is also one of the strategies of the climate change policy.

**8.3. Links to Other Mitigation Actions**

**Gold Standard Voluntary Offset Project**

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| --- |
| Efficient Cooking with Ugastoves |

**Related Registered CDM Project**

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| --- |
| The Uganda Nile Basin Reforestation Project by the National Forestry Authority (NFA) |

**Related CDM Project with Letter of Understanding**

|  |
| --- |
| Kachung Forest Project in Dokolo District |

**Related CDM Projects in the pipeline**

|  |  |  |
| --- | --- | --- |
| **Project Name** | **Project Site** | **Total Investment** |
| The Namwasa Reforestation Project | Bukuya and Kassanda sub-counties of Kassanda County of Mubende District | Current investment $5mPlanned further $20m over the next 3-5 years |
| Improved charcoal production from renewable biomass | Mubende and Kiboga Districts |  |
| Timber Plantation in Kikonda Forest Reserve | KikondaKiboga District | US 78M |
| CDM Small-scale PoA in East Africa covering Renewable Energies (SPEAR) | Uganda, Kenya, Tanzania, Rwanda, Burundi, Ethiopia | NA |
| CDM Improved Cook Stoves for East Africa (CSEA) | Uganda, Kenya, Tanzania, Rwanda, Burundi | NA |
| Sameer’s Environment Conservation Project through Boiler Fuel Switch to Biomass | Kampala | NA |

**References**

Adkins E, et al. (2010) *Testing institutional biomass cookstoves in rural Kenyan schools for the Millennium Villages Project*, Energy for Sustainable Development., doi:10.1016/j.esd.2010.07.002

Carrie M. Lee,\*, Chelsea Chandler, Michael Lazarus and Francis X. Johnson*Assessing the Climate Impacts of Cookstove Projects: Issues in Emissions Accounting***,** Challenges in Sustainability | 2013 | Volume 1 | Issue 2 | Pages 53–71 DOI: 10.12924/cis2013.01020053.

Gold Standard Methodology “Technologies and practices to displace decentralised thermal energy consumption”, (11/04/2011).

Methodology for Improved Cook-stoves and Kitchen Regimes V.02 – 08/02/2010 Gold Standard.

## Annex II: Institutions and Key Persons

**Ministry of Energy and Mineral Development**

Permanent Secretary: Mr. Fred Kabagambe Kaliisa

and Chair Energy and Minerals

Sector Working Group

Director Energy and Minerals Eng. Paul Mubiru

and Accounting Officer:

Advisor to Chair Energy and Eng. Moses Murengezi

Minerals Sector Working Group

Ag Commissioner Energy Resources Mr James Baanabe

Department

Assistant Commissioner New and Mr Godfrey Ndawula

Renewable Sources of Energy

Senior Energy Officer (Bioenergy) Mr John Tumuhimbise

Senior Energy Officer (Bioenergy) Mr Godfrey Kimuli

**Ministry of Education and Sports**

Permanent Secretary: Dr. Lukwago Nassali

Director Basic Education: Dr Y. Nsubuga

Director Higher Education: Ms Edith Gabona

Commissioner Educational Planning: Mr Godfrey Dhatemwa

**Ministry of Water and Environment**

Climate Change Unit

Coordinator Mr. Paul Isabirye

Deputy Coordinator Mr. Chebet Maikut

**National Environment Management Authority**

Executive Director Dr. Tom Okurut

Environmental Economist Mr. Ronald Kaggwa

**UNDP**

Team Leader Energy and Environment Mr Onesmus Muhwezi

Programme Analyst

Energy and Environment – Mr.Daniel Omodo McMondo

Project Manager Low-Emissions

Capacity Building Project Ms. Martha Bbossa

Program Analyst Mr Frederik de Staun