



REQUEST FOR MSP APPROVAL

(1-STEP PROCEDURE)

TYPE OF TRUST FUND: GEF Trust Fund

PART I: PROJECT IDENTIFICATION

| | | | |
|---|---|------------------------------|-------------------------|
| Project Title: | Promoting energy efficient cook stoves in micro and small-scale food processing industries | | |
| Country(ies): | Chad | GEF Project ID: ¹ | 5795 |
| GEF Agency(ies): | UNIDO | GEF Agency Project ID: | 120617 |
| Other Executing Partner(s): | Agence pour l'Energie Domestique et l'Environnement (AEDE), Ministry of Environment and Fishery | Submission Date: | 04-10-2014 30-5-2014 |
| GEF Focal Area (s): | Climate Change | Project Duration (Months) | 36 |
| Name of parent program (if applicable): | N/A | Project Agency Fee (\$): | 63,175 |

A. FOCAL AREA STRATEGY FRAMEWORK²:

| Focal Area Objectives | Expected FA Outcomes | Expected FA Outputs | Trust Fund | Grant Amount (\$) | Co-financing (\$) |
|-----------------------|--|--|------------|-------------------|-------------------|
| CCM-2 (select) | Outcome 2.2. Sustainable financing and Delivery mechanisms for promoting energy efficient technologies in the relevant sectors established and operational | Output 2.2: Investments Mobilized Output 2.3: Energy savings achieved | GEFTF | 665000 | 2,600,000 |
| Total Project Cost | | | | 665,000 | 2,600,000 |

B. PROJECT FRAMEWORK

| Project Objectives: To promote energy efficient cook stoves in traditional agro-food processing industries | | | | | | |
|--|------------|--|--|------------|-------------------|------------------|
| Project Component | Grant Type | Expected Outcomes | Expected Outputs | Trust Fund | Grant Amount (\$) | Cofinancing (\$) |
| 1. Improving the design of cook stoves to achieve the optimum fuel efficiency | Inv | Energy efficient cook stoves accepted and deployed | 1.1. Infrastructure for the assembly of stoves and development of new models established 1.2. Local cook stove manufacturers trained on improved technology assembly, maintenance, sales, management and marketing skills, quality control and after-sale service | GEFTF | 220,000 | 500,000 |

¹ Project ID number will be assigned by GEFSEC.

² Refer to the reference attached on the [Focal Area Results Framework and LDCF/SCCF Framework](#) when filling up the table in item A.

| | | | | | | |
|--|----|---|--|-------|---------|-----------|
| | | | 1.3. Local distribution channels developed and operationalized 1.4. Micro-enterprises trained on proper use and maintenance of the EE cook stoves | | | |
| 2. Creating sustainable financial schemes for financing the acquisition of energy efficient stoves | TA | Facilitation to access to finance for the beneficiaries (manufacturers & end-users of energy efficient stoves) put in place | 2.1. Credit and savings mechanism including guarantee scheme for micro-enterprises developed and operational. 2.2. Framework for scaling up the project impacts and ensuring sustainable income streams through the voluntary carbon market developed. | GEFTF | 90,000 | 1,300,000 |
| 3. Improving the business performance of micro-enterprises | TA | Increased income and improved product quality generated | 3.1. Networks of micro-enterprises developed in selected pilot clusters 3.2. Linkages between the value chains for EE cook stoves manufacturers and the micro-enterprises using the stoves in targeted clusters created 3.3. Management and production enhancement skills of micro - enterprises developed 3.4. Awareness of the microenterprises on the benefits of improved cook stoves and clustering acquired | GEFTF | 250,000 | 600,000 |
| 4. Monitoring & Evaluation | TA | Adequate monitoring and evaluation mechanisms are in place, facilitating smooth and successful | 4.1. Regular monitoring exercises conducted, PIRs prepared, tracking | GEFTF | 45,000 | 45,000 |

| | | | | | | |
|--------------------------------------|--|---|--|-------|---------|-----------|
| | | project implementation and sound impact | tools according to the GEF requirements prepared. 4.2. Final project evaluation conducted | | | |
| Subtotal | | | | | 605,000 | 2,445,000 |
| Project Management Cost ³ | | | | GEFTF | 60,000 | 155,000 |
| Total Project Cost | | | | | 665,000 | 2,600,000 |

C. CO-FINANCING FOR THE PROJECT BY SOURCE AND BY NAME IF AVAILABLE, (\$)

| Sources of Cofinancing | Name of Cofinancier | Type of Cofinancing | Amount (\$) |
|--------------------------|---|---------------------|------------------|
| National Government | Agence pour l'Energie Domestique et l'Environnement | Cash | 1,000,000 |
| GEF Agency | UNIDO | In-kind | 300,000 |
| GEF Agency | UNIDO | Cash | 60,000 |
| Foundation | Shell Foundation | In-kind | 110,000 |
| CSO | Envirofit | In-kind | 90,000 |
| CSO | Envirofit | Cash | 40,000 |
| National Government | Ministry of Environment | Cash | 1,000,000 |
| Total Cofinancing | | | 2,600,000 |

D. GEF/LDCF/SCCF/NPIF RESOURCES REQUESTED BY AGENCY, FOCAL AREA AND COUNTRY¹

| GEF Agency | Type of Trust Fund | Focal Area | Country Name/Global | Grant Amount (a) | Agency Fee (b) ² | Total c=a+b |
|------------------------------|--------------------|------------|---------------------|------------------|-----------------------------|-------------|
| | | | | | | |
| Total Grant Resources | | | | | | |

¹ In case of a single focal area, single country, single GEF Agency project, and single trust fund project, no need to provide information for this table

² Please indicate fees related to this project.

E. CONSULTANTS WORKING FOR TECHNICAL ASSISTANCE COMPONENTS:

| Component | Grant Amount (\$) | Cofinancing (\$) | Project Total (\$) |
|----------------------------|-------------------|------------------|--------------------|
| International Consultants | 93,000 | 330,000 | 423,000 |
| National/Local Consultants | 185,000 | 280,000 | 465,000 |

F. DOES THE PROJECT INCLUDE A "NON-GRANT" INSTRUMENT? No

There will be no non-Grant instrument financed by the GEF grant. However the project will setup a financial mechanism that guarantees groups of micro-scale enterprises towards local banks to facilitate access to financing.

PART II: PROJECT JUSTIFICATION

³ PMC should be charged proportionately to focal areas based on focal area project grant amount in Table D below.

A. Project Overview

A.1. Project Description. Briefly describe the project, including ; 1) the global environmental problems, root causes and barriers that need to be addressed; 2) the baseline scenario and any associated baseline projects, 3) the proposed alternative scenario, with a brief description of expected outcomes and components of the project, 4) incremental cost reasoning and expected contributions from the baseline , the GEFTF, LDCF/SCCF and co-financing; 5) global environmental benefits (GEFTF, NPIF) and adaptation benefits (LDCF/SCCF); 6) innovativeness, sustainability and potential for scaling up.

1) The global environmental problems, root causes and barriers

Energy situation in Chad

Although Chad is relatively well endowed in terms of energy sources e.g. solar and oil, firewood remains the principal fuel source in the country. According to the Oil and Gas Journal, Chad is the country ranked as the tenth-largest oil reserve in Africa with 1.5 billion barrels of proven reserves as of 1 January 2013. The production of crude oil in Chad during the year 2012 was estimated at 105,000 barrels per day (bbl/day). Further, Chad ranked 38 worldwide in respect to its proven oil reserves, according to the CIA World Factbook in 2010.

In view of its location and being a Sahelian country, Chad benefits from great solar potential of about 4.5 billion MWh/year and therefore ranked 20 worldwide in 2008 for its solar potential(National Renewable Energy Laboratory NREL, US Department of Energy DOE).

Despite the facts stated above, in 2008 biomass accounted for 94% of the primary energy supply in Chad (Clean Energy Info Portal, REEGLE). Only 2.2% of the Chadian households have access to electricity, among which only 1% is outside the capital of N'Djamena (REEGLE). Chad relies on imports of natural gas.

Between 1990 and 2010, Chad lost 12.1% of its forests (FAO). With a high population growth of 2.6% in 2011, ranked 31st (World Bank) and the presence of refugees from neighbouring Sudan, South Sudan and Central African Republic, pressure on firewood and forest is constantly growing. The imbalance between supply and demand of firewood accelerates desertification and poses concerns for rural, peri-urban and urban development as well as energy supply. In fact, 79% in urban and 90% in peri-urban and rural areas of the energy supply derives from ligneous sources.

To curb the high deforestation rates, the Government of Chad passed an act that prohibits cutting green wood, which is in place since January 2009. Further, there are a few initiatives implemented in villages such as the 100 villages Village Exploitant Rationnellement son Terroir (VERT) initiative which promotes villages to rationally exploit their local resources. Often the measures promoted are not efficiently executed and enforced.

The VERT initiative commenced in October 2013 and targets areas away from N'Djamena. Its main objective is to reduce the pressure on forest and support the Government's fight against desertification through the creation of accredited zones close to the capital where dead wood can be collected. These are areas where the needs in terms of firewood are the highest in the country and represent 79% of the energy consumption of urban households. The initiative supports (a) creating Local Management Committees consisting of members from the local communities especially women, who are responsible to put in place and manage a local market of firewood and (b) creating 3 village nurseries (village forests/replanting) in 3 villages around the capital including Garia in the Batha region (385km from N'Djamena), Abourda (335km from N'Djamena), and Mokofi in the Guera region (420km from N'Djamena).

Industrial Sectors Targeted

As one of the poorest and least developed countries in the world, ranked 184 out of 186 at the human development index (UNDP, 2012), Chad’s economy relies significantly on Agriculture followed by Services. Industry accounts for 9.4% of the country’s GDP, where oil, cotton textiles, meatpacking, brewing, natron (sodium carbonate), soap, cigarettes and construction materials are the most prominent industries.

A 2010 study on firewood consumption in the framework of the project formulation for a strategy and action plan of urban and peri-urban forestry (FUPU) estimated that the beer brewing and catering sectors in the capital N’Djamena alone consume around 14,000t of firewood per annum over 3,300 cabarets (equivalent of bars) and 2,300 meat grilling stands. These two sectors exclusively use firewood for their cooking activities. As cutting of green wood is prohibited, the entrepreneurs mostly rely on buying wood in the market at a price which exceeds three times the price of wood before the ban on cutting wood was enforced (FUPU study). The high consumption of firewood exerts a negative impact on environment and affects the livelihood of micro and small entrepreneurs in the country.

Traditional breweries produce a local beer called “billi-billi”, which is sorghum based alcoholic drink that requires intensive cooking between 10 and 16 hours per batch. The breweries qualify as cottage industries exclusively operated by women entrepreneurs in the backyard of their houses. Each brewery employs 4 to 15 women and produces 2 to 3 batches of beer, 150 to 200 liters each, per week. At least 54 kg of wood is required per batch. The bili-bili can be sold and consumed on the third day of the process. It is sold at a cabaret (equivalent to a bar for which the women pay a rent twice a week. Each cabaret has on average 12 breweries selling their beer on different days. Beer brewers cook the beer on traditional 3 stones cook stoves supporting one barrel. The stoves used are outdated and highly inefficient, increasing even further the amount of wood utilized per batch.

In addition to breweries, smoking/grilling various types of meat “tchélé” is another sector that consumes a lot of firewood. The tchélé is run by men who chose their points of sale along the streets, either with a simple booth or a small shop that includes an extension with benches where consumers can consume the meat on the spot. These entrepreneurs employ between 2 and 5 people depending on their size and whether they also do the butchery related work. The survey conducted during the preparation of the project reveals that the average daily profit margin for the tchélé operators is around US\$ 11.2 to 22.4.

As a result of the survey, four intervention zones were selected as the focus areas for the project activities. The intervention zones were selected based on two criteria, namely; high concentration of the enterprises in selected areas and the proximity to the capital N’Djamena, which is one of the main intervention zones employing 2,300 tchélé and over 40,000 beer brewers. The four selected zones are:

| City & surrounding villages of | Distance from the capital |
|--------------------------------|---------------------------|
| N’Djamena | n.a. |
| Massaguet | 100 km North-East |
| Guelendeng | 150 km South |
| Mandélia | 55 km South |

A map view of the selected zones is displayed below:



2) Baseline Scenario & Projects

Supply of Energy Efficient Cook Stoves in Chad

In Chad, traditional agro-food industries especially traditional beer brewing and meat grilling use large commercial cook stoves characterised by low energy efficiency due to the incomplete combustion of firewood. This leads to longer cooking times and an increased consumption of firewood, which may be addressed through the implementation of energy efficient cook stoves, which are expected to save at least 50% of the firewood consumption and considerably decrease the cooking times. Thus the shift to energy efficient cook stoves allows users to increase their income and profit margins by decreasing their fuel costs and optimizing the production process. It further contributes to decreasing GHG emissions and reducing deforestation rates and negative impacts on health.

The survey implemented during the preparatory phase for the project identified 28 craftsmen manufacturing cook stoves used for the targeted food processing sectors in the four intervention zones. In Chad although locally developed energy efficient stoves for two targeted sectors are available, those technologies have not been commercialized and disseminated into the Chadian market. Two local cook stove manufacturers have developed prototypes for EE stoves with the support of the Association pour le Développement de Micro-Crédit – association for the development of microcredit (ACID-MC) and Action pour la Technologie Appropriée à la Protection de l’Environnement et le Développement (ATAPED). The prototypes developed have not been commercialized yet as the manufacturers are facing some constraints related to limited financial resources, high costs of raw materials (especially sheet metal), absence of relevant technical training and support and weak market demand .

ACID-MC is an association created in 2007 to support groups of women and youth to manage energy efficient and alternative energy initiatives in the agro-food sector. The association supported the development of the Pulvigaz stoves, one for beer brewing and one for meat grilling using natural gas as a fuel source. ATAPED on the other hand supported the development of an improved stove for the Tchélégrille which can use wood or natural gas. Further, some efforts were made to create a group of craftsmen producing cook stoves and support the group to meet weekly but in practical terms the group meetings were held a few times only. At the moment, because of the barriers named above, local cook stove manufacturers cannot produce and sell their EE stoves at a market scale.

The main barriers for the introduction of energy efficient stoves in the micro-scale food-processing sectors in Chad which the project aims to overcome are the following:

- Technology:

Improved cook stove technology should not only be appropriate to the needs of each sector/usage

but also affordable, easy to use, durable, widely available and socially acceptable/desirable. The main hurdle in terms of technology is also related to support to manufacturers as well as relevant training, focus on performance and monitoring, uniformity of the stoves as well as quality assurance.

- Financing:

Access to finance is one of the key issue that entrepreneurs are facing and especially in LDCs such as Chad. In order to be able to produce and sell improved cook stoves, some significant investments have to be done to adapt the technology to the users' needs as well as further improve the energy efficiency and performance of the stoves to be commercialized.

- Dissemination:

To achieve the shift from traditional energy inefficient to improved cook stoves rapid and large-scale adoption of improved cook stoves is necessary. This can be achieved by overcoming other of the mentioned barriers on the demand side as well as ensuring a certain production capacity and appropriate technology on the supply side.

- Resistance:

The introduction and dissemination of new, energy efficient technologies goes along with reluctance to change was first as the targeted entrepreneurs are used to a specific technology for a certain time. Thus a strategy has to be put in place to overcome the resistance and reach the acceptance of the users as well as the consumers.

- Awareness:

The lack of information on potential new energy efficient technologies leading to reduced fuel consumption and costs while improving the production process (e.g. less cooking time) , health conditions (no more burns, respiratory and optical diseases) and the livelihood as a whole is a tremendous barrier. Thus the project aims at putting significant efforts on awareness raising activities.

Baseline Projects

Fighting against desertification has been a priority in the countries of the Sahel region since October 1984 in Nouakchott where a regional strategy had been developed. The objectives were to slow down the desertification and degradation process of the environment by ensuring the basic needs of the population while preserving the ecological equilibrium. In the framework of this strategy, Chad has decided to focus on two pillars on the energy related topic: promotion of improved cook stoves and substitution fuels for firewood and charcoal.

The government of Chad have thus *inter alia* developed a Domestic Energy Strategy and given the role of implementing it to the AEDE (Agence pour l'Énergie Domestique et l'Environnement) in 1997. Between 1990 and 2010, the following main activities were undertaken:

- Creation of 100 VERT villages (see A.1.1)) with 500,000ha of set up forests managed by dedicated local management structures
- Dissemination of more than 40,000 domestic ICS
- Technical capacity building of local domestic cook stove manufacturers e.g. blacksmiths and women potters
- Development of an expertise inside of the AEDE
- Institutional capacity building of NGOs and local communities
- Implementation of the project on natural resources management in the oil region of Doba.

The government had also put in place a prohibition of cutting and selling green wood.

However, the efforts made in terms of reforestation (e.g. VERT villages) were limited. Introducing and disseminating energy efficient technologies in the traditional food processing sector in Chad did not happen yet while for domestic cook stoves it remains with limited tangible results.

As such, conscious of the urge to promote EE stoves while promoting the private sector, the government is strongly willing to mobilize and use funds to support significant impacts in firewood and GHG emissions reduction while improving the livelihoods of their food processing players through the promotion of adapted ICS. To fill its knowledge and experience gap on this field as well as to effectively and efficiently reach a larger scale of micro-scale producers and introduce more appropriate EE technologies, the government strongly supports the intervention of the GEF especially shown by using part of its STAR allocation as well as a USD 1 million co-financing over the 3-year period of the project.

3) Proposed alternative scenario

While the political will and commitment of the Chadian Government towards conserving forests and reducing the reliance on woody biomass as the main source of fuel in Chad, the absence of advanced technologies, the lack of know-how, knowledge and capacity and limited financial capacity prevent the development of a market to promote energy efficient cook stoves. Without the GEF-funded alternative scenario, the market for energy efficient cook stoves will remain very weak and will consist of fragmented efforts without reaching the market scale. The GEF funded project will support the development of the market for improved energy efficient cook stoves by engaging players from the private sector, civil society, technology providers, financing experts as well as Governmental institution. It will also improve the economic livelihood of micro and small industries and integrate energy issues into their business practices and helping them advance by replacing basic technologies to low emission and fuel saving technologies. This shift would not be possible without the GEF intervention. The GEF funded project targets on one side the supply of energy efficient stoves in the country along with improving the livelihoods of the targeted sectors' entrepreneurs and their communities through:

- Promoting EE stoves consuming 50 – 80% less firewood for processing food
- Clustering the two sectors in each intervention zones to support the demand of improved cook stoves, generating collective gains and empowering the women and men entrepreneurs. The clusters will be used to build on and integrate the reforestation efforts of the VERT project into the cluster action plans and supporting the end-users establish to sustainable chains of fire wood supply.
- Facilitating access to finance to acquire improved cook stoves by putting in place a credit and savings scheme as well as linking up to the voluntary carbon markets to generate additional revenues for end-users switching to improved cook stoves.

The proposed project aims at promoting energy efficient cook stoves in traditional agro-food processing industries in Chad with a focus on 2 sub-sectors: traditional sorghum based beer brewing (bili bili, kochat and argui) and meat grilling (tchélé).

The shift to energy efficient technologies would contribute to improved production processes, cost reduction and additional income generation for the end-users. While the continued use of firewood is not a long term solution, the market in Chad is still premature and the technologies developed for the targeted applications at the time being focus on reducing the firewood consumption rather than promoting alternative fuels. The application of alternative fuels may be explored within the development and testing of appropriate cook stove models. The beer brewery sector is dominated by females while the meat grilling is dominated by males, therefore the project pays a particular attention into streamlining gender aspects across the various project activities. The project will focus on large cook stoves for commercial usage in and around N'Djamena, Guelendeng, Massaguet and Mandelia. The four areas were selected with the approval of the national counterpart based on clear criteria (see A.1.1)). The co-financing committed by the Government will be allocated mainly to scale up the project by extending it to other cities and areas where one or both sectors are highly represented such as Moundou, Moussoro, Abéché

and Mongo.

The project addresses the identified barriers through a mix of technical assistance and financial assistance activities.

| Barrier | Actions |
|---|---|
| <p>Lack of awareness</p> <p>The traditional food sector users of cook stoves are not aware of the economic, environmental and health benefits of improved cook stoves.</p> | <p>UNIDO will work together with its project partners AEDE, the Ministry of Environment and Fisheries, Shell Foundation and Envirofit, as well as created clusters, NGOs, sector associations, and other relevant partners on spreading awareness on the benefits of improved cook stoves in the targeted sectors.</p> <p>The focus will be put on the users e.g. women beer brewers and men grilling meat but also on the consumers of the related products.</p> <hr/> <p>Related project outcome: 3. Improving the business performance of micro- and small-scale enterprises</p> <p>Outputs: 3.4</p> |
| <p>Traditional technologies embedded in the end-users' behavior</p> <p>Beer brewers and tchéle operators are used to their traditional cook stoves and production processes</p> | <p>The project will introduce and disseminate end-users' needs adapted and state-to-the art stoves with the support of Envirofit, leader in clean cooking technologies in the developing world. Thanks to awareness raising activities (see point above), demonstration projects in the intervention zones supported by AEDE, customized financial schemes and production improvement actions, end-users will be motivated to overcome their resistance to change and shift to EE stoves.</p> <p>Related project outcomes: 1. Improving the design of cook stoves to achieve the optimum fuel efficiency 2. Creating sustainable financial schemes 3. Improving the business performance of micro- and small-scale enterprises</p> <p>Outputs: 1.1, 2.1, 2.4, 3,3</p> |

| Barrier | Actions |
|--|--|
| <p>Lack of capacity to design, produce and sell relevant EE technologies</p> | <p>By collaborating with the Shell Foundation and Envirofit experienced in introducing and</p> |

| | |
|--|--|
| <p>The two local EE cook stove manufacturers for the two targeted sectors of the project have developed prototypes but were unable to commercialize them. The EE, cooking performance and suitability of the stoves to the user's needs were not fully assessed.</p> | <p>disseminating ICS as well as based on UNIDO's experience in a similar project in Burkina Faso, adapting existing proven commercial EE stoves to the local needs of the targeted sectors, implementing an assembly line and relevant distribution channels while integrating local cook stove producers will further leverage the impacts of the ICS on the environment and the livelihood of the end-users. As such bigger GHG emissions reductions and larger scale dissemination of ICS can be achieved.</p> |
| <p>Lack of financing</p> <p>EE stoves are more expensive to acquire than traditional ones.</p> | <p>Related project outcomes: 1. Improving the design of cook stoves to achieve the optimum fuel efficiency</p> <p>Outputs: 1.1 – 1.5</p> |
| <p>Missing sustainability aspect of similar initiatives when mobilized funds are over</p> <p>Previous initiatives to introduce ICS were offering the stoves to part of the population and no real take-off happened afterwards.</p> | <p>Adapted financing schemes to each and every cluster and beneficiary will be put in place to ensure that end-users willing to shift to clean technologies can afford them.</p> <p>Related project outcome: 2. Creating sustainable financial schemes</p> <p>Outputs: 2.1, 2.4</p> |
| <p>Missing sustainability aspect of similar initiatives when mobilized funds are over</p> <p>Previous initiatives to introduce ICS were offering the stoves to part of the population and no real take-off happened afterwards.</p> | <p>Leveraging on the country's and UNIDO's past experience as well as best practices, the project encompasses sustainability in all its components in close collaboration with its partners and the project's end-users. This includes capacity building of ICS suppliers and distributors, food processors and institutions, developing an assembly line along with distribution channels for ICS, supporting the scale up of production & distribution, financing schemes (credit, saving and carbon credits), putting in place village forests with the active participation of end-users, clustering entrepreneurs to generate additional incomes.</p> <p>Related project outcomes: 1. Improving the design of cook stoves to achieve the optimum fuel efficiency 2. Creating sustainable financial schemes 3. Improving the business performance of micro- and small-scale enterprises</p> <p>Outputs: 1.2-1.5, 2.1-2.4, 3.1-3.3, 3.5</p> |

In addition to the project management, monitoring and evaluation, the project consists of three main components and a Monitoring & Evaluation Component:

- (1) Improving the design of cook stoves to achieve the optimum fuel efficiency.

This component includes the support to develop appropriate cook stoves adapted to user's needs in each of the selected sectors in partnership with Envirofit International, which is a social enterprise established to develop well-engineered technology solutions to improve the human condition on a global scale. Envirofit has proven experience in developing markets for clean cookstove solutions that are customized for various applications. The involvement of Envirofit International will enable the development and dissemination of cookstoves that are well adapted to the users' needs. Envirofit will work closely with the two local EE stove producers as well as other stove producers on the design, assembly and dissemination of the EE cookstoves.

Within the lifetime of the project, the project will import pre-fabricated stoves in several batches. The first batch of around 100 stoves should be delivered at the end of 2014/early 2015 to create a gradual demonstration effect and the remaining stoves should be installed within the next two years of project implementation. The Government of Chad will support custom/tax free importation of the improved cook stoves to disseminate improved cook stoves on a wider scale in the Chadian. As the market for clean cook stoves in Chad is very underdeveloped and the demand for improved cook stoves is very low therefore it would be premature to consider establishing a production line for cook stoves in Chad. Therefore within the lifetime of the project, the focus will be on laying the foundation by identifying and training qualified assemblers of the stoves, providing them with the tools required to assemble the stoves, identifying warehouses and potential distributors to store, distribute and sell the stoves through designated sale points.

Technology transfer to local manufacturers at a later stage and also linking to regional production facilities such as the one in Nigeria may follow. The growth in the sales and projections will justify a shift to local production. Envirofit's experience in Kenya was in a way that they imported the products for the first two years and then started the partial assembly of the products on site towards the third year. By now the entire production is taking place in Kenya. The project will facilitate south-south cooperation between the existing facilities of Envirofit based in Kenya and Nigeria and the Chadian entrepreneurs through supporting the exchange of knowledge and experience among experts of those countries.

Output 1.1.:

The first essential step is to interact with and understand the users of the future EE stoves namely women beer brewers and men grilling meat. Observations of the detailed production process of the targeted sectors and interviews with focus groups as a representative sample of users of the two targeted sectors will play a key role in understanding the needs of the stove users. The experience of the existing local cook stove producers in the local market will be helpful further develop the prototypes developed and bring them into the market.

The Shell Foundation will support the analysis of the use of the existing traditional stoves and the benefits of the tailored improved stoves. Further details will be gathered through tailored questionnaires and interviews planned within the cluster diagnostic study under component 3 targeting both the users and producers of the stoves.

Accordingly the technicians to be trained on the assembly of the stoves will be selected, the distribution points, retailers and warehouses to store the improved stoves for the beer brewers will be designated in close collaboration with Envirofit and the local manufacturers.

Since the tchélegrill is not available within Envirofit's product portfolio, it will provide technical and R&D to local cook stove manufacturers to improve their prototypes and introduce them into the market. During the cluster diagnostic, the possibility of sourcing the raw material for the production of the stoves locally or from regional sources will be explored.

Output 1.2.:

The local manufacturers of cook stoves and the technicians identified earlier will receive training on the product design, assembly of the improved stoves, their installation and maintenance. The

trainees will not only enhance their technical skills but also their management skills especially in terms of sales & marketing as well as quality control. Experts from Kenya and Nigeria may support the training to allow the Chadian entrepreneurs to benefit from their experience and lessons learned in projects within a similar context.

As such they can understand the product and offer relevant sales and after-sales services ensuring not only the quality of the product but also of the related services to their customers/the EE stoves users.

Output 1.3.:

Without dedicated distribution channels the supplied stoves will not reach their users (“Place” in the theory of the marketing mix/4Ps of McCarthy, 1960). Shell Foundation and Envirofit in their proven business model have integrated local distribution channels. They not only identify the potential local distributors but also train them via the “Envirofit University” which is an online training platform to address point of sales education. This will enable the local distributors across the intervention zones improve their capacity and better convince the potential customers to shift to the EE stoves. It will also ensure that local distributors upgrade their skills on how to train food processors to use and maintain their stoves for a sustainable performance of the stoves.

The “Envirofit University” would be provided in French. To support access to the courses, the project will facilitate access to computers and internet at designated points to be institutionalized within AEDE and its outreach network.

Envirofit in partnership with John Hopkins University launched a training programme for women’s empowerment that supports leveraging women entrepreneurship throughout the value chain for improved cook stoves to increase their adoption. The training will be offered through the project and is expected to enhance the capacity of women entrepreneurs throughout the ICS value chain: manufacturing, management and sales & marketing.

Output 1.4.:

To further sustain the adoption of the ICS and based on past experiences and best practices, (potential) users of EE stoves need to be properly trained on how to efficiently use their stoves and maintain it to get the best out of their stoves: EE, cooking performance and lifetime.

In addition to the personal demonstration on the usage and maintenance of the stoves by local distributors, the Shell Foundation will support the development and dissemination of tailored user guides. Each user will also receive a poster on clear do’s and don’ts (drawings & in writing) to further facilitate the usage.

| Output | Activity |
|---|---|
| 1.1. Infrastructure for the assembly of stoves and development of new models established | 1.1.1. Develop technology team and close collaboration between technology experts: Envirofit, local cook stove manufacturers, distributors, technicians, etc. |
| | 1.1.2. Determine the market needs (observations, focus groups/interviews) |
| | 1.1.3. Identify relevant area for warehouses, sales and distribution points, technicians to be trained across the intervention zones. |
| | 1.1.4. Support the R&D to further develop the tchélegrill prototype & determine local and regional sourcing of raw materials |
| 1.2. Identified local cook stove manufacturers trained to efficiently support the EE stove supply | 1.2.1. Train identified partnering local stoves manufacturers on the assembly, installation and |

| | |
|--|--|
| | maintenance of the stoves as well as management skills such as marketing, sales & after-sales and quality control. |
| 1.3. Local distribution channels developed, trained and operational | 1.3.1. Train local distributors via the “Envirofit University” |
| | 1.3.2. Train women entrepreneurs to empower them and integrate them into the EE stove value chain (manufacturing, management, sales/marketing) |
| | 1.3.4. Ensure efficient functioning of local distribution channels (incl. effective marketing, sales & after-sales) |
| 1.4. Users of EE stoves trained on usage and maintenance of their stoves | 1.4.1. Train users on usage and maintenance of their stoves via local distributors |

(2) Creating sustainable financial schemes.

The wide-scale dissemination of EE stoves depends on the availability of alternative technologies and funding and the improved end-user awareness of the benefits of EE stoves and alternative technologies. Given the fact that the project works mostly with entrepreneurs in the informal sector with limited income streams and profit margin, facilitating access to finance is crucial to ensure a wider scale dissemination of the improved stoves. The project will not provide any subsidies to the end-users to purchase the improved cook stoves but will support the entrepreneurs obtain funds to finance the energy efficient stoves. Using a commercial model of financing treats the beneficiaries as consumers rather than recipients of aid and allows them to be more responsible.

According to the survey done for the project preparation in August-September 2013, the daily profit margin of the targeted food processors does not exceed USD 22 and the costs related to firewood per day (meat grilling)/process (beer brewing) is around USD 13, which is equivalent to \$ 260 per month assuming 20 days of operation per month. The Envirofit institutional stove is in the range of US\$ 700 excluding VAT and customs and has a proven efficiency of 80% reduction in the amount of firewood required for the same operation. Therefore the monthly savings in the price of firewood are estimated at US\$ 208 per month allowing the operators to recover their invested capital in around 5 months.

To facilitate the purchase of EE stove, the project supports the creation of a financial scheme to support the users in mobilizing the funds required to purchase the new stoves. The financial scheme proposed build on the experience of UNIDO in the Burkina Faso project and lessons learned within the schemes implemented by the Shell Foundation/Envirofit in other countries.

Further by creating local capacities and linking up to the voluntary carbon markets, the project aims at ensuring a reliable income stream to sustain the economic achievements in the sectors of intervention, support future projects on improved cook stoves and enrich the role and experience of women and men working in the sector.

A detailed presentation of the activities and outputs planned within this component are presented below:

Output 2.1.:

Following the experience gained in Burkina Faso, the project will work on the creation of self-help-groups or what is known in Chad as the “tontine”. The development of clusters serves very well in that connection as the cluster promotes the spirit of the group and one of the core action areas within the cluster action plan is mobilizing self-financing to support the purchase of

improved stoves.

Within the scheme, subgroups, of a size between 5 to 10 cluster members, are formed and encouraged to develop savings behaviour. The subgroups will be created based on common needs, geographical proximity and friendship and trust as these are key to the success of the scheme. Getting the users together within the subgroups allows them to pool their resources together to finance the improved stove. It also supports them in getting financing from microfinance institutions if needed as it reduces the related risks towards the financial institution in granting credits since the group commits to covers for the defaulting members who are not able to pay back at a given period.

At the group level, every member pays a monthly contribution into a fund. This fund is managed by the subgroup where members know each other well and agree to work together in a group. Each month another member gets the collected money. The selection of the member obtaining the internal credit is based on his/her expressed needs, the approval of the majority of the members as well as his/her perceived/proven credibility. In order to reflect the co-financing generated for purchasing the stoves by the micro-enterprises, the Ministry of Environment takes responsibility to ensure that financing of around US\$ 1,000,000 will be mobilized directly by the micro-enterprises to purchase 1500 new stoves.

In cases when larger investment needs are required, the project will identify a local micro-financing institution to provide collective or individual credits could be granted. In this case savings are collected on a regular basis and deposited at a bank with two subgroup members being the signatories to ensure higher security. Depending on the investment needs of each group member, credit could be given either by the group directly or by requesting credit from a local micro-finance institution if needed. The savings of the subgroups (subgroup guaranty scheme), the potential individual savings along with the principle of support among the subgroup members if one of them defaults of a member will constitute a reduction of the risk for the bank.

A similar model was already implemented by UNIDO within the scope of the GEF project on promoting energy efficient technologies in the beer brewery sector in Burkina Faso. Within that project UNIDO established a collaboration with two local financial institutions which offer credit for groups of project beneficiaries. In that case groups of small-scale food processors can chose the financial institution that suits them best based on their own needs, which may include past experience with the financial institution, loan conditions and geographical distance of the institution. The development of groups within the cluster and the basic business training offered to the entrepreneurs allows them to comply with the bank requirements and increases their chances of getting a loan. In that sense, the project in Chad will build on the experience in Burkina Faso taking into account the Chadian context.

The project develops a dual level guaranty scheme:

- One at subgroup level nurtured by the subgroup members via a monthly contribution and deposited at the partnering local financial institution;
- One at project level to cover potential larger defaults for an amount of USD 20,000. During the project implementation a legal entity/microfinancing institution will be identified. The activities, responsibilities and arrangements to be made with this entity will be defined as early as possible during the project implementation and prior to effecting any payment.

Basic accounting skills as well as repayment on time will be taught to ensure a sustainable system.

The Shell Foundation based on its lessons learned and best practices will support the development of a sustainable financial mechanism. It will also contribute to awareness raising on the needs and benefits of such a scheme as well as participate to the related capacity building efforts. One of the schemes employed within other projects supported by the Shell Foundation

and Envirofit is based on a model where the distributors of the stoves make the upfront payment related to the cost of the stove and they are paid back on a monthly basis using 75% of the estimated costs related to firewood savings and 25% is kept with the users of the stove to encourage them and promote the use of the stoves within the community. If this model is applied, it is expected that the users would be able to pay back the costs of the stoves within around 6 months by paying US\$ 150 to pay off the price of the stove monthly and will still earn US\$ 50 extra per month due to the savings achieved.

Thus, end-users willing to shift to EE technologies, active members of created financial subgroups (see outputs below), creditworthy and reliable will be eligible to get access to finance.

Through this component, the project will install at least 1,500 energy efficient cook stoves. The selection criteria for the 1500 cook stoves to be improved include: a) energy performance of the old stove, b) usage rates, c) quantity of wood consumed, d) efficiency of the new stove, e) economic feasibility of the investment and f) ability to comply with the requirement of the financial agreement with the local bank.

Output 2.2.:

According to the Global Alliance for Clean Cookstoves, carbon financing is playing a key role in the development of a global market for clean cookstoves and fuels. Carbon markets can bring in significant revenues to support the dissemination of improved cook stoves in various areas of the world and especially in Sub-Saharan countries. These revenues generate significant revenue for the stove businesses and provide options for keeping prices low for the consumer. It will sustain the economic achievements in the sectors of intervention, support future projects on improved cook stoves and enrich the role and experience of women and men working in the sector as it incentivizes the monitoring, increased usage and adoption and increased fuel efficiency and durability. It will also replicate and complement the achievements of the local financial mechanism. Banks involved in the local financial mechanism may act as the coordinating and monitoring entity (CME) of the project if they invest in the registering the POA or supporting its development.

Despite valuable income streams that may be generated through the carbon market, the market remains very complex and costly particularly in connection with the certification requirements to measure and monitor emission reductions. In addition the uncertainty around the future of the carbon markets hinders investments at scale and the financing gap between the project registration and the first revenues from the carbon markets necessitate the availability of initial working capital to get the flow starting.

In line with the Alliance's strategy the project will support the creation of knowledge platform to provide information on carbon financing, share best practice guidelines for revenue sharing and incentives and stimulating the demand for the credits by engaging potential buyers, linking buyers and sellers and forging partnerships.

To support the creation of the local knowledge of the carbon markets, the project will train local relevant stakeholders from the ministries, NGOs and civil societies, private sector representatives to acquire theory and practice on cook stove carbon market projects that will help them get a better understanding and knowledge of the carbon markets. The project will also support the creation of a national platform to exchange knowledge, tools, best practices and information on the carbon markets with local stakeholders.

The Shell Foundation will support the development of a business plan for scaling up the project and support its inclusion into existing carbon market programmes operated or planned by Envirofit in the region.

The project will allow smaller players to pool their credits for sale of larger buyers and ensure equitable revenue sharing between the carbon players and the stove producers/users.

As displayed in the annex E, conservative estimates of the cash flow incoming from the carbon markets related to projects supporting the introduction of 1000 stoves at a price of EUR 6 / ton CO₂, the annual income for the project from the carbon market is expected to be in the range of EUR 17500 per year and a total of around EUR 250,000 per 22 years.

| Output | Activity |
|---|---|
| 2.1. Credit & savings mechanism incl. guaranty scheme for micro-enterprises developed and operational | 2.1.1. Raise awareness on credit & savings mechanism with end-users |
| | 2.1.2. Create subgroups based on determined selection criteria |
| | 2.1.3. Implement adapted financial scheme for each subgroup |
| | 2.1.4. Train two members per subgroups to basic accounting skills and efficient financial scheme |
| | 2.1.5. Partner with micro-finance institution as required |
| | 2.1.6. Compile the results and lessons learned from the implementation of these projects & disseminate through different media and building on the experience of the Global Alliance for Clean Cookstoves |
| 2.2. Developing a Framework for scaling up the project impacts and ensuring sustainable income streams through the voluntary carbon markets | 2.2.1. Train 20 master project developers on GS project identification and development |
| | 2.2.2. Develop and support the operation of a national platform disseminating information on carbon market |
| | 2.2.3. Support matchmaking between the buyers and the sellers, pooling of credits and the creation of an equitable revenue sharing mechanism |
| | 2.2.4. Support linking up with identified regional PoAs (incl. contracts) |

(3) Improving the business performance of micro and small enterprises.

A cluster is a high geographical density of enterprises engaged in related production activities along a given value chain. As such it can play a leading role in the development of a dynamic private sector. It allows micro and small enterprises to enjoy a range of benefits they could not reach being isolated. Among these benefits there are pooling common factors and resources (shared purchase of inputs, raw material and equipment, specialized suppliers, market linkages, etc.) but also increased solidarity, improved skills thanks to trainings and knowledge sharing, optimized productivity, etc. The clusters empower each gender: women in beer brewing and men in meat processing.

The cluster not only includes enterprises in a given segment of a value chain but also encompasses other players of the value chain (e.g. suppliers of cook stoves, of raw materials, etc.), service providers, related and support institutions. In the project it would be for instance the local representations of the Ministry of Environment and Ministry of Energy and Oil, associations of women beer brewers and of meat processors, vocational training centres, etc.

Thus the component 3 focuses on supporting the development of at least 4 clusters of enterprises in and around the selected cities of the projects: N'Djamena, Massaguet, Guelendeng and Mandelia. The exact number of clusters, their geographical borders and the entities participating to the cluster will be determined during the cluster diagnostic study to be undertaken at project start.

Cluster building also supports the development and integration of efficient supply and distribution chains for EE cook stoves leading to increased market demand. Sensitization, awareness raising and information efforts along with capacity building of cluster members are supporting the outcomes of this component.

UNIDO has built its cluster development experience since the mid-1990s in projects in developing countries all over the globe. UNIDO has also constantly improved and adapted its cluster development methodology to fit to the specifics and realities of each context. Many of these projects have been undertaken in Sub-Saharan Africa for micro and small-scale food processors. More specifically, the GEF funded project on promoting EE technologies in the beer brewing sector in Burkina Faso has already implemented with success this approach whereby through the project interventions 4 clusters were developed around the traditional beer brewing value chain. Here-again, south-south cooperation between the cluster development agents and members of the clusters in Burkina to display to the Chadian entrepreneurs the success of the proposed model will be necessary. Exchange visits between the two countries will be facilitated to further support innovation in this area.

Envirofit commit to and will support the training of women support groups which is currently run within the Global alliance for clean cookstoves.

Training and mentoring of the executive partner and stakeholders will be provided by UNIDO and selected experts from Burkina Faso. Support to improve the performance of micro and small scale food processors via the clusters will be ensured at each step of the implementation of the project and component 3 from the cluster diagnostic study through action planning to the monitoring & evaluation. Links between the different players of the value chain as well as the related institutions will be enhanced, contributing to an increased performance and improved livelihoods of the micro and small enterprises targeted. The local executing partner will bring in their in-country experience and access at the grassroot level. They will also ensure the national ownership of the initiative.

Output 3.1.:

The first essential step in component 3 is the Cluster Diagnostic Study. It is a deep dive into the actual situation of the value chain of the two targeted sectors in the selected intervention zones. It gives clear and detailed insights on the various players of the value chain (identification of the enterprises/number, localization, characteristics, processes/flow charts, turnover, cost structure, profit margin, issues, etc.), their relationships to each other, the cook stove technology used, the related institutions, development partners and service providers. All the pieces of information are collected via a survey and interviews in the field as well as secondary desk research. The cluster diagnostic study leads to a Cluster Mapping where all potential members of the cluster and their relationships are depicted. During the cluster diagnostic study awareness raising efforts among the various stakeholders on the cluster concept and its benefits as well as the importance of shifting to EE technologies and the project are made.

A detailed action plan per cluster is derived from the cluster diagnostic report and integrated into the project work plan. The consolidated project work plan is shared with key stakeholders and needs the approval from the Steering Committee.

The implementation of the action plan leads to the development of clusters around the two target sectors namely beer brewing and meat grilling.

Output 3.2.:

In order to implement the cluster action plan efficiently, the links between the different identified cluster members have to be developed and/or strengthened. Dialogue and consultations between the different value chain links and institutions will be organized and concrete agreements sealed when needed.

A special focus will be put on creating associations and legally registered groups for the two targeted food processing sectors as well as linking them up with the EE cook stove manufacturers/distributors to support the dissemination of EE stoves. The cluster association in each intervention zone will be leading discussions to agree with the manufacturer/distributor of EE cook stoves on the price, quality, guarantee, training on usage and maintenance of the EE stoves, delivery, and any other relevant point to them. The cluster association will act as a centralized buyer: each food processor member of the cluster willing to shift to the EE stove shall submit his request to the cluster association. As such the EE stoves can be bought in bulk at better conditions (demand side) and facilitate and ensure purchasing orders of EE stoves (supply side). This approach also facilitates the monitoring of EE stoves installed and the feedback of the users to be shared with suppliers and distributors.

Output 3.3.:

Once the members of the clusters understand the benefits of working hard together and trusting each other, collective gains as well as individual profits can be further enhanced. As such, trainings on management skills and productions enhancement will be offered. The training will be tailored to the audience and very practically oriented e.g. with concrete examples and exercises in their own sector. The integration of the topics learnt during the class will be checked, stimulated and reinforced thanks to the regular visits of the PMU and especially the Cluster Development Agents - CDAs (part of the PMU and working mostly in the field. Each CDA has 1-2 clusters to take care of depending on the size and complexity of the relevant cluster to be determined during the project) who are in close contact with their clusters.

Output 3.4.:

As the overall objective of the project is to promote energy efficient stoves for the targeted food processing micro-scale industries, a particular focus will be put in the clusters to stimulate the demand for ICS. Awareness raising activities including demonstration projects and comprehensive explanation of the benefits to shift to EE stoves, appropriate usage and maintenance will be undertaken within the clusters. Thanks to the development of clusters, purchasing can be centralised at cluster level. The ICS are bought in bulk to benefit from economies of scale and other favourable conditions (maintenance long term agreements with the supplier, etc.). The cluster association will play thus also a role of catalyser of the demand for ICS as well as monitoring of the number of EE stoves acquired, links to and service quality of local distributors of EE stoves, and support to tracking the EE stoves' efficiency and carbon emissions reduction (see Activity 2.2.3.).

| Output | Activity |
|---|---|
| 3.1. Cluster Diagnostic | 3.1.1. Perform a detailed cluster diagnostic report that identifies the enterprises/number, localization, characteristics, processes/flow charts, turnover, cost structure, profit margin, issues |
| 3.2. Cluster Action Plan | 3.2.1. Create associations and legally registered groups for the two targeted food processing sectors 3.2.2. Link associations to EE cook stove manufacturers/distributors to support the dissemination of EE stoves |
| 3.3. Training to members of the cluster | 3.3.1. Train entrepreneurs on benefits of the cluster approach, improving their business performance, joint procurement & collective efficiency |
| 3.4. Awareness Raising | 3.4.1. Hold awareness raising activities to disseminate the benefits of clustering and the benefits of adopting improved cook stoves |

4) INCREMENTAL COST REASONING AND EXPECTED CONTRIBUTIONS FROM THE BASELINE , THE GEFTF, LDCF/SCCF AND CO-FINANCING;

So far no initiative has been launched in the country to introduce energy efficient technologies for productive activities. Being one of the priorities of the government to fight against desertification and combat climate change, GEF resources were allocated to support the dissemination of EE cook stoves in the traditional agro-food industry.

GEF resources are incremental as they allow the targeted sectors using stoves to shift to more EE stoves reducing wood consumption and GHG emissions. Without GEF support, the above-mentioned barriers, the objective and successful implementation of such project would not be addressed and the base knowledge to create a market for energy efficient stoves in the country will be absent. This would lead to a further degradation of deforestation and desertification levels as well as health conditions of users, consumers and their respective households and no reduction of GHG emissions. As it is also the aim of the project to ensure sustainability and replicability, GEF's incremental activities will ensure the scaling up of the project results and activities to other areas in the country via knowledge sharing.

5) Global environmental benefits

The global environmental benefits deriving from the project are related to:

- Reduced concentrations of smoke and air pollution
- Reduced forest degradation and conserve biodiversity
- Reduced greenhouse gas emissions

The estimation of the emission reductions related to the adoption of energy efficient cook stoves in the two targeted sectors in Chad is calculated using the small scale methodology AMS-II.G. – version 3, which is applicable for Gold Standards Projects.

Preliminary estimations were obtained through a feasibility study that included end-users' interviews as well as a study on firewood undertaken in 2010 in N'Djamena by the Ministry of Environment and some general assumptions as outline in Annex E.

Direct reductions

As tchéle operators use their stoves every day while beer brewers only twice a week (because of the limited number of bars/cabarets where they can sell their products), the total direct emissions through the installation of 1,500 energy efficient stoves over the duration of the project would reach 12,162 tCO₂ e per year.

Indirect emission reductions – top down

The market potential for improved cook stoves in industrial and commercial uses is at least 10 times the scale of the project. Therefore assuming a reduction of 121,620 tCO₂ e per year may be achieved from all stoves operating in these sectors and assuming a causality factor of 0.4 means a top down indirect emission reduction estimate of 48, 648 t CO₂ per year and 486,480 over the lifetime of 10 years.

Indirect emission reductions – bottom up

Assuming a replication factor post-project as spillover of 4.0 as a result of both the demonstration projects and capacity building , the indirect top down market potential amounts to around 4,864,800 t CO₂ over 10 years.

Further information on the calculation of the GHG emission reductions is available in Annex E to this document and the attached GEF/STAP methodology spreadsheet.

6) Innovativeness, sustainability and potential for scaling up

The project is considering the baseline projects very innovative and will have a significant impact in its intervention zones and beyond. Indeed, the government of the Republic of Chad plans via its co-financing contribution to also extend the project to other relevant zones during and after the project.

The innovativeness of the project lies in the commercial driven model applied, which presents a more sustainable way of dealing with the problem because it depends on market forces to guide the product development and drive consumer demand. Treating the operators as customers rather than aid recipients.

The sustainability of the project is ensured through different levers:

- Component 1 : Technology
Capacity building of local cook stove manufacturers to support them to further improve their energy efficient stoves (using different fuels) and build their management and marketing skills
- Component 2: Access to Finance
Development and operationalization of a financial mechanism supporting the promotion of energy efficient stoves with one or more key local financial institutions, guarantee schemes and initiating savings attitude among the end-users
Capacity building at national level on accessing additional finance for cook stove projects thanks to the voluntary carbon markets including developing and/or linking up with existing Program of Activities (PoA) and implementing such projects, leading to additional revenues for end-users/ sustaining the dissemination of energy efficient stoves

The potential for scale up of the project is real through:

- Facilitating access to finance via credit and the voluntary carbon markets
Government’s will to expand the project to other zones of the countries (possibly to Moundou, Moussoro, Abéché and Mongo)
- Component 3: Cluster Development of micro-enterprises
Cluster building uniting all relevant stakeholders in and around the traditional beer brewing sector on the one hand and the meat processing sector on the other, leading to collective gains and better integration into the local value chain

A.2. Stakeholders. Identify key stakeholders (including civil society organizations, indigenous people, gender groups, and others as relevant) and describe how they will be engaged in project and/or its preparation:

The key national stakeholders of the project are:

| Individuals/Companies | Institutions |
|--|---|
| <ul style="list-style-type: none"> • Women beer brewers • Men meat processors • Cook stove producers • Other players of the value chain • Carbon market stakeholders • Families & communities • Consumers of processed food | <ul style="list-style-type: none"> ○ Associations of beneficiaries ○ AEDE, Agence pour l’Energie Domestique et l’Environnement (Agency for Domestic Energy and Environment), governmental agency and executing partner of the project ○ Ministry of Environment and Fishery ○ Ministry of Energy and Oil ○ Any NGO or other development partner relevant to the project implementation and |

| | |
|--|--|
| | sustainability <ul style="list-style-type: none"> ○ Ministry of Women Empowerment ○ Co-financers |
|--|--|

A Project Steering Committee (PSC) will be established with representatives from the institutions mentioned above, UNIDO, and the GEF Focal Point in Chad. The Board will review project plans, provide advice on strategic approaches and solutions to ensure that project objectives are achieved. The PSC will meet every 6 months.

A brief description of every project partner (national and international) and their related role is described in the table below:

| Institution name | Envisaged role in the project |
|--|---|
| Ministry of Environment & Fishery | <ul style="list-style-type: none"> • Counterpart of the project • Support in the promotion of the project and EE stoves especially in terms of outreach and logistics |
| AEDE | <ul style="list-style-type: none"> • Executing partner of the project • Host location and close collaboration with the PMU • Support via its expertise in EE and stoves to various aspects of the project |
| Association of beneficiaries (more or less structured depending on the geographical area and sector) | <ul style="list-style-type: none"> • Support in particular to the cluster development of micro-enterprises and generating collective gains (incl. reduced costs of inputs, facilitation to access to finance, empowerment, etc.) |
| Any other ministry & government agency | <ul style="list-style-type: none"> • Synergies between their activities and the project to be leveraged • Members of the steering committee as such giving feedback & advice for the efficient implementation and sustainability of the project |
| NGOs (incl. ATVPE – Association Tchadienne des Volontaires pour la Protection de l’Environnement) | <ul style="list-style-type: none"> • Support & advice especially in terms of sensitization and training on various topics depending on their own expertise and the project needs |

| Institution name | Envisaged role in the project |
|---|--|
| Shell Foundation (Member of the Global Alliance for Clean Cook Stoves as Donor) | <ul style="list-style-type: none"> • Support the dissemination of clean cook stove solutions • Support the development and scale-up of models to disseminate the use of clean cook stoves • Share knowledge and experience gained through projects implemented in other countries and regions |
| Envirofit (Member of the Global Alliance for Clean Cook Stoves as Implementor) | <ul style="list-style-type: none"> • Develop well-engineered technology solutions to improve the energy efficiency of institutional stoves • Support and train local technicians on the assembly of the stoves • Support the development of related projects within the carbon market |

A.3. Describe the socioeconomic benefits to be delivered by the Project at the national and local levels, including consideration of gender dimensions, and how these will support the achievement of global environment benefits (GEF Trust Fund/NPIF) or adaptation benefits (LDCF/SCCF):

By promoting energy efficient cook stoves, the project will contribute to significantly reducing the wood consumption of the micro-scale food processors in the intervention zones in Chad. Indeed the technology used so far, compared to other countries in Sub-Saharan Africa, is rather basic and requires needs a higher amount of firewood- a scarce resource in a Sahel country. The technology used is an open fire type e.g. without a combustion chamber hence leading to calorific waste, incomplete combustion, harmful smokes and a certain amount of CO₂e emissions.

Introducing energy efficient technologies will not only reduce their fuel cost but also thanks to specific project activities improve their production processes (incl. management & marketing, hygiene, safety, etc.) and their health (complete combustion).

The livelihoods of the micro-scale food processors (beer brewing and meat grilling) and the cook stove producers but also of their respective households, communities and consumers of their products will thus be improved.

The energy savings will support global environment benefits via the CO₂ savings of 580,000 tonnes over 10 years. In addition, the installation of the improved stoves will result in a saving of about \$ 2500 per year, out of which the cost of the stove is around \$ 700 to be paid during the first year of operation. This has a significant impact on the livelihood of the end-users targeted as it increases their profits.

Women continue to have lower rates of participation in the labour market, high unemployment rates and pay differences around the world and particularly in developing countries. According to the ILO, 95% of the female labour force in Chad resides in the informal economy, which makes the women working in these sectors more vulnerable to inequalities of the labour market. As the project targets the beer brewing sector, which is a sector dominated by women, a core focus for the project is supporting the women entrepreneurs in improving the business performance of their enterprises and linking them together through clusters to ensure that they have a stronger voice in determining the development of their business.

The training offered with the support of Envirofit and John Hopkins University under component 1 of the project will further support the empowerment of women entrepreneurs along the supply chain for improved cook stoves.

Throughout the training programmes offered within the project, efforts will be made to make the training available to equally qualified female candidates and will target as a 30% participation rate by women candidates. Efforts will also be made to make the training accessible to women for example, minimum level of literacy, adequate day times for women participation, locations easily accessible to women, etc. In addition, during the inception phase, a basic gender analysis will be done to ensure the integration of gender sensitive indicators in the project results framework.

The project works towards achieving environmental objectives and simultaneously contributes to promoting gender equality through supporting female brewers in running a profitable business, access financing and bringing women together in clusters, which gives them a stronger voice in the community. Furthermore by linking up to emissions trading via the carbon markets, the project will ensure that the associations of female brewers play a role in monitoring activities within each programme of activities and that they support bringing income streams from the carbon markets to support the regular maintenance of the stoves. Moreover, efforts will be made to offer training to equally qualified females.

A.4 Indicate risks, including climate change, potential social and environmental risks that might prevent the project objectives from being achieved, and if possible, propose measures that address these risks:

| Risk | Potential Impact | Probability | Management/ Mitigation |
|---|-------------------------|--------------------|--|
| The government policies and programmes supporting energy efficiency and sustainable energy would be discontinued and the project results would not be mainstreamed. | Medium | Low | Promoting energy efficient stoves is one of the priorities of the Chadian government as stated in the Environment policy following the regional strategy adopted in Nouakchott in 1984. The Government commitment is displayed in the allocation of funds to support the programme and its replication within the country. |
| The global climate change would have negative impacts on the firewood supply. | Low | Negligible | The impact of global climate change on the firewood supply within the lifetime of the project is negligible. In the longer term, the reforestation efforts undertaken by the Government and research into alternative fuels will support reducing the impacts and shifting away from firewood. |
| The energy efficient stoves supplied within the project would not perform as expected. | Medium | Low | Envirofit performed rigorous testing on the stove and ensures that an 80% reduction in the wood consumption will be met. Envirofit also carries out a detailed evaluation once the stoves are put in the field. |
| The cost of the new stoves would be too high for commercialization. | Medium | Medium | The wood savings per month will allow the operators to pay back the cost of the new stoves within around 7 months and allow them to make profit beyond the initial investment cost paid. |

A.5. Explain how cost-effectiveness is reflected in the project design:

The project aims at reducing significantly GHG emissions while decreasing the pressure exerted on deforestation and desertification in a Sahel country facing high levels of climate

vulnerability. The two sectors chosen account among the productive activities consuming the most firewood - a scarce resource in Chad – and being very energy inefficient considering the basic cook stove technologies used. Energy costs along with the opportunity costs related to time to get the firewood and negative health impacts represent the biggest share of costs for the two sectors targeted.

Introducing EE cook stoves reducing the wood consumption by at least 50% and up to 100% for the EE stoves using alternative fuels will thus generate significant savings for the users while improving their health and environment. Only with the energy cost savings set aside, users can repay their investment for the EE stoves within a few months – the investment being supported via component 2 – Facilitation to access to finance.

The project model – technical and managerial capacity-building, implementation of EE technologies, facilitation to access to finance – has proven its efficiency in other UNIDO projects in developing countries and especially in LDCs. A similar UNIDO project under GEF 4 in Burkina Faso focusing on one of the two targeted sectors of the project namely traditional beer brewing is successfully under implementation.

The project is designed to guarantee long term sustainable savings beyond the lifetime of the project by inherently continuing to stimulate the demand thanks to demonstration projects, mouth-to-mouth propaganda and sensitization efforts supported by the government. The plan of the government to expand the borders and replicate the project in other areas of the country will further contribute to shift toward more EE stoves and reduced energy costs. The financial mechanism developed is also a way to sustain the dissemination of EE stoves and thus generating cost savings.

Skills development in terms of increased value creation within each sector (supply, production, marketing, sales, etc.) as part of the cluster building activities (component 3) will generate increased cost-effectiveness.

The efforts to create national capacity in terms of carbon finance to support the further dissemination of the stoves will ensure additional saving beyond the lifetime of the project.

The cost effectiveness of the project in terms of the CO₂ savings per \$ is estimated at \$60/ton, which is comparable with other similar GEF funded projects.

A.6. Outline the coordination with other relevant GEF financed initiatives [not mentioned in A.1]:

There is no clear synergy between the proposed project and other ongoing project financed by the GEF in Chad at the time of the project preparation.

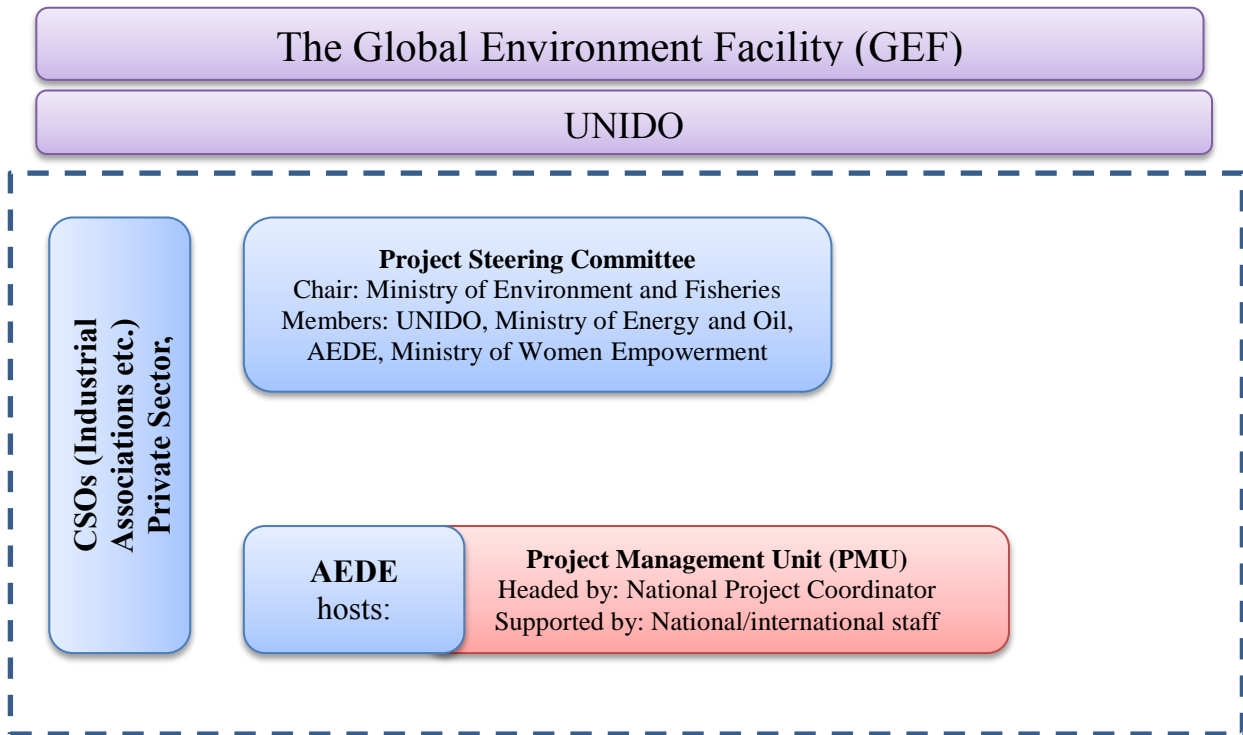
A.7 Describe the institutional arrangement for project implementation:

As the GEF Implementing Agency, UNIDO holds the ultimate responsibility for the implementation of the project, the delivery of the planned outputs and the achievement of the expected outcomes.

UNIDO will be responsible for the general management and monitoring of the project, and reporting on the project performance to the GEF. UNIDO will be in charge of procuring the international expertise needed to deliver the outputs planned under the three project components. It will manage, supervise and

monitor the work of the international teams and ensure that deliverables are technically sound and consistent with the requirements of the project.

The project implementation arrangement as stated in A.2. will be structured as follows:



Inception Phase: The project inception phase is intended to kick start project activities, complete the requirements for project registration, select the project team and setup the project office and prepare the project operational manual and the first year work plan. It will conclude with the first meeting of the Project Steering Committee where the team, the work plan and the project operational manual will be presented to all the project partners.

Implementation Phase:

All stakeholders of the project will be represented in the Project Steering Committee. Members will be informed on a monthly basis about the implementation status of the project through a project newsletter sent electronically and twice a year at the Project Steering Committee. Clear roles and responsibilities in the implementation of the project as well as the detailed work plan will be agreed upon at the 1st Steering Committee (and updated if necessary during the project roll out).

The project will be coordinated through a Project Management Unit (PMU) to be hosted at AEDE or at the Ministry of Environment and Fishery. The PMU is responsible for the day-to-day management, execution and monitoring of project activities as per an agreed annual project work plan.

AEDE will be the national executing partner of the project supporting the implementation of the project and its possible geographical extension. AEDE and PMU will work very closely together to ensure an efficient implementation of the project.

The Project Management Unit (PMU) itself will be composed of:

- A National Project Coordinator
- 2 national Cluster Development Agents

B. DESCRIPTION OF THE CONSISTENCY OF THE PROJECT WITH:

B.1 National strategies and plans or reports and assessments under relevant conventions, if applicable, i.e. NAPAs, NAPs, NBSAPs, national communications, TNAs, NCSA, NIPs, PRSPs, NPFE, etc.

National Communication

Chad signed and ratified the United Nations Framework Convention (UNFCCC) on Climate Change on 12 June 1992 and 30 April 1993 and ratified the Kyoto Protocol on 10 August 2009. The second national communication was prepared by the Government of Chad with the support of UNDP and GEF financing and submitted to the UNFCCC in June 2012.

The document summarized the main characteristics of the energy sector in Chad as follows:

- A strong energy dependence on fuel imports prior to the development of local refinery petroleum products in 2011;
- A significant proportion of wood-based fuels (wood, charcoal and residues plants) and fauna in final consumption more than 80%;
- Limited access to conventional energy including fossil source with 3-4 % electricity coverage.
- A small extension of renewable energy (wind and solar).

To address the critical energy situation, the Government of Chad developed a framework to meet the energy demands of the population as contained in its policy letter and strategy for the electricity sub-sector (2002-2006). The policy foresees increasing access to energy to support agricultural and industrial productivity and sets a secondary objective to promote alternative energy sources such as solar and wind to limit the impact of cutting firewood on the regeneration of forest resources.

To support this policy, the Government put in place a programme with specific objectives that include: (i) rehabilitate and increase production capacity and existing infrastructure, (ii) achieve electrification secondary centers and border cities (iii) promote the use of fuel less expensive, and (iv) promote the use of renewable and alternative energy.

Also, in order to contribute to the mitigation of GHG Chad and reduce the impacts of deforestation, the following actions were proposed within the national communication in connection with the use of energy efficient stoves:

- Promoting the wide-scale dissemination of improved cook stoves.
- Introduce alternative fuels such as butane gas to replace the use of firewood for home cooking. This will reduce the strong dependence on firewood and pressure on forests.

NAPA:

The NAPA's main objective is to reduce the climate change effects on the most vulnerable communities in order to reach sustainable development. As such the project complies with the NAPA as it targets micro-scale enterprises in the food processing, informal sector highly depending on the climate hazards (availability of firewood, cereals and livestock) by supporting them to ensure and increase incomes and livelihoods.

Climate change observed and expected in Chad (multiplication of droughts, floods, sand storms, extreme temperatures, violent winds, etc.) have harmful effects especially on the agro sector. The latter is crucial e.g. occupying more than 75% of the population and representing about 40% of the GDP.

Ligneous resources especially firewood are particularly affected: lack of water, extremely high temperatures and deforestation. Hence a reduction of at least half of the wood consumption thanks to the dissemination of EE cook stoves could reduce the strong pressure exerted not only on the environment but also on the socio-economic conditions.

Furthermore, one of the main orientations of the NAPA consists in sensitizing on climate change issues, an element that is put forward in all the 4 components of the project.

- PRSP:

The Poverty Reduction Strategy Paper 2 (PRSP2) reflecting the national development policy of Chad prioritizes the food-processing sector while focusing on protecting the environment and promoting the development of the private sector. A particular effort is put on reinforcing capacity building. The project is thus in line with these priorities as by creating value added in the rural sector by transforming cereals and livestock in products with higher margins. In addition project end-users will receive support & advice in technical and managerial terms.

- National Action Plan against Desertification:

Deforestation and GHG emissions can be reduced thanks to decreased consumption of firewood via the introduction of EE cook stoves using less wood or natural gas or biogas. Hence it would contribute to slow down the desertification process in Chad and in the area.

B.2. GEF focal area and/or fund(s) strategies, eligibility criteria and priorities

The relevant GEF focal area is CCM- 2 Energy Efficiency – Promote market transformation for EE in industry and the building sector. The project promotes the introduction and dissemination of EE cook stoves in the micro-scale food processing industry namely traditional beer brewing and meat grilling. It will positively contribute to the market transformation as so far there are no EE stoves in these two wood consuming sectors. By not subsidizing the stoves per se the project will not lead to market distortions. The project will support both market forces:

- Offer: supporting cooks stove to disseminate EE stoves in the two relevant sectors (Component 1)
- Demand: creation of micro-enterprise clusters to stimulate the need and purchase of the EE stoves (Component 3)

And facilitate access to finance for both offer and demand to further foster the adoption of the EE stoves.

As such the project will support the government's efforts to mitigate climate change especially by extending and replicating the project to a larger geographical scope.

B.3 The GEF Agency's program (reflected in documents such as UNDAF, CAS, etc.) and Agencies comparative advantage for implementing this project:

- UNIDO LDC Operational Strategy:

The project complies with UNIDO's LCD Operational Strategy, endorsed by LDC countries at the LDC Ministerial Conference held in November 2011 in Vienna, Austria. Indeed it fulfills 2 main pillars namely "Adding value by converting commodities into products" and "targeting the most vulnerable communities" (especially women and smallholders/micro-scale enterprises).

- UNIDO's Energy Strategy:

The latter aims at supporting developing countries and countries in transition to achieve the following objectives:

- Increase the competitiveness of their industries by reducing the dependence on fossil fuels;
- Reduce their impact on climate change by decreasing the carbon emissions of their industries and by promoting renewable energy technologies;
- Increase the viability of their enterprises, particularly in rural areas, by augmenting the use of locally available renewable energy sources.

The project promotes EE technologies using less biomass as well as using renewable energies namely natural gas and biogas.

- UNDAF:

Chad has a temporary UNDAF for 2012-2013. The upcoming strategy should be in line with the temporary version and include UNIDO. The project would as such match with specific effects of 2 out of the 3 main priority lines of the UNDAF. It would include reinforcing capitals (social, financial, natural, human, etc.) of rural micro-scale enterprises to support employment as well as sustainable management of environmental resources. Capacity building, EE technology dissemination, access to finance as well as better integration into the value chain are key levers. Moreover, the governance related component of the UNDAF supporting populations to participate in the decision process is part of the project via the development/reinforcement of associations and clusters leading to increased empowerment of groups of beneficiaries.

- UNIDO's comparative advantage:

The GEF Council document GEF/C.31/5 (p.7, 36-37) gives UNIDO comparative advantage for this Strategic Program under the Intervention Type Capacity Building/Technical Assistance. The project has a strong focus on promoting Industrial Energy Efficiency through accelerating the dissemination of EE cook stoves in the micro-scale food processing industry in Chad.

UNIDO has built its expertise on EE related topics in the industry for more than three decades *inter alia* via capacity building and technology transfer, development and deployment in developing countries and LDCs in particular. Moreover, UNIDO has extensive experience in MSME development crucial in this project.

Today UNIDO is implementing a similar project on the promotion of EE stoves for the traditional beer brewing sector in Burkina Faso.

Therefore UNIDO has a significant comparative advantage to implement this project because of its experience and expertise in promoting EE technologies along with developing and sustaining MSMEs.

- Burkina Faso experience:

Since May 2012, UNIDO with financing from the Global Environment Facility (GEF) has been working on a similar project in Burkina Faso; the project directly contributes to MDGs 1 (Eradicate Extreme Poverty and Hunger), 3 (Promote Gender Equality and Empower Women) and 7 (Ensure Environmental Sustainability). This intervention will impact the lives of over 500 women entrepreneurs by supporting them in building better businesses, while also promoting energy efficient technologies, which is estimated to reduce the CO₂ emissions from their activities by around 40,650 tons annually.

The programme is planned around the same three-pillar approach proposed within the scope of this project (a) technology deployment and demonstration, (b) improving the business performance of the beer brewers and (c) facilitating access to sustainable financing.

(a) Technology Deployment and Demonstration

The project provides a platform for the demonstration of three different types of technologies for improved cook stoves, but on a wider scale also promotes locally manufactured technology solutions that depend on locally available fuel. In cooperation with IRSAT, a national research center which has been working on the designs of improved cook stoves for the last 30 years, the project trains 100 craftsmen and graduates of vocational training schools on the designing and building of improved cook stoves and creates demand for their services.

In the first phase, the project focused on wood-based energy efficient stoves and at the demonstration level, natural gas driven stoves (due to the availability of natural gas and the related subsidies). In the second phase, the project will look into the feasibility of using other renewable energy sources, such as biogas, for industrial applications at the level of the beer brewers.

(b) Improving the business performance of the beer brewers

As mentioned earlier, beer brewing is an important source of income for women in Burkina Faso; however, the beer brewing process is labor intensive and the profit margin is very small. This, in addition to the geographical proximity and concentration of the beer brewers, made the idea of developing clusters to improve the business performance of the beer brewers very relevant. These clusters aim to pool common factors and resources, such as a skilled workforce, specialized suppliers and market linkages, and foster collective efficiency through joint actions such as information sharing, networking, and the shared purchase of inputs or raw materials.

Considering that the women beer brewers in Ouagadougou are fairly well organized through a beer brewer association that represents the sector and takes up issues of common concern, the project targets 4 intervention zones in the rural areas of Pabre, Saaba, Ziniaré and Zorgho where the beer brewers have no common representative body. Through constructive dialogue, the project supports beer brewers within every cluster to identify a shared vision of the cluster and have them commit to the achievement of common goals. In each cluster, a cluster development agent supports the group in working towards these goals through the preparation, implementation and monitoring of a cluster action plan that aims to improve business practices through the following activities:

- 1) Creating associations of *dolotières* in the four areas of intervention to develop soft skills among members and undertake common initiatives for the purchase of raw materials, transportation, marketing, testing, and other issues related to the future development of the sector;
- 2) Promoting self-financing within small groups and supporting them to develop linkages with financial institutions and access credit directly or through the association;
- 3) Enhancing entrepreneurship and basic management skills
- 4) Creating awareness on hygiene in the manufacturing and selling of beer;
- 5) Creating awareness on the benefits of improved cook stoves and the technology options available to further promote these improved cook stoves;
- 6) Creating quality consciousness in beer processing and training in conducting simple quality tests.

The association of beer brewers in Ouagadougou has plans and ambitions to expand into a nationwide federation, so the creation of these community-level associations in rural areas, outside the reach of the federation, further facilitates its activities.

(c) Facilitating access to sustainable financing

In addressing the issue of financing, the project looked into the immediate financing needs, as well as the longer-term need to ensure a reliable income stream to sustain the economic achievements in the sector, support future projects on improved cook stoves and enrich the role and experience of women working in the sector.

To address the short-term financing needs and improve access to the credit offered by banks, the project promoted the concept of self-help groups/group financing which are not common among the *dolotières*. The main purpose of the groups is to develop a saving behavior and solidarity in order to collect money to finance the costs of the improved cook stoves; trust and knowledge of each other are key to the success of this system.

The financing aspect is touched upon at different levels; an improved cook stove costs around FCFA 80,000, 75% of which is related to the costs of the main inputs, such as the aluminum pots which may be bought in bulk through the women's association and later of the federation to ensure better pricing.

In such cases, the women's association represents and guarantees the women vis-à-vis financial institutions and is paid in installments by collaborative groups of twenty to thirty women that come together and form a group. The Group has to be officially registered as a smaller form of the regional beer brewer association. Each group designates two representatives to establish a bank account on behalf of the group, or represent the group with the association, and who are responsible for paying back the credit installments.

Members of the group sign a written agreement to reinforce their commitment to the group and define the penalty to be enforced by the group in cases of non-repayment by one or more of the members. Each member contributes a fixed amount of FCFA 1,000 per month at the month's end to the 2 representatives who in turn pay this towards the bank loan. In the case that one of the group members cannot contribute during a given month, members of that group contribute equal shares of that member's contribution and collect that installment at a later date from the defaulting member. The project keeps a small contingency fund with the bank for guarantee purposes in the case of non-repayment by the group.

In order to ensure that the project provides a reliable income stream that continues to finance further improved cook stoves and support the maintenance of the old cook stoves, the project supports the creation of local capacity for project developers to prepare projects and facilitate financing through the carbon markets. In addition, the project puts forth a monitoring plan that promotes the women's associations and the larger federation as the owners of future micro-scale programmes of activities (POAs) that fit under the umbrella of a country-wide POA developed and currently under registration by a local NGO.

Inputs from the experience of the Burkina Faso project were critical in the design and tailoring the project into the Chadian context.

C. DESCRIBE THE BUDGETED M & E PLAN:

According to the Monitoring and Evaluation policy of the GEF and UNIDO, follow-up studies such as Country Portfolio Evaluations and Thematic Evaluations can be initiated and conducted. All project partners and contractors are obliged to (i) make available studies, reports and other documentation related to the project, and (ii) facilitate interviews with staff involved in the project activities.

Project Start

A Project Inception Workshop will be held within the first 3 months of project start involving those with assigned roles in the project organisation structure. The inception workshop is crucial to building ownership for the project results and to plan the first year work annual work plan. The Inception Workshop will address a number of key issues including:

- Understand objectives, outputs, activities
- Assist all partners to fully understand and take ownership of the project
- Detail the roles, support services and complementary responsibilities of local stakeholders vis a vis the Project Management Unit (PMU)
- Discuss roles, functions and responsibilities within the project's decision making structures, including reporting and communication lines, and conflict resolution mechanisms
- Based on the project results framework, finalise the first annual work plan
- Review and agree on the indicators, targets and their means of verification and recheck assumptions and risks
- Provide a detailed overview of reporting, monitoring and evaluation (M&E) requirements. The M&E work plan and budget should be agreed and scheduled.
- Plan and schedule Project Steering Committee (PSC) meetings. Roles and responsibilities of all project organisation structures should be clarified and meetings planned.

The first PSC meeting should be held as soon as possible after the inception phase deliverables are available.

Annual Project Review/Project Implementation Reports (APR/PIR)

These key reports are prepared to monitor progress made since project start and in particular for the previous reporting period. The APR/PIR includes, but is not limited to, reporting on the following:

- Progress made toward project objective and project outcomes – each with indicators, baseline data and end of project targets (cumulative)
- Project outputs delivered per project outcome (annual)
- Lesson learned/good practice
- Expenditure reports
- Risk and adaptive management
- Portfolio level indicators (i.e. GEF focal area tracking tools) are also used by most focal areas on an annual basis

End of Project

An independent Final Evaluation will take place 3 months prior to the final PSC meeting and will be undertaken in accordance with UNIDO and GEF guidance. The final evaluation will focus on the delivery of the project's results as initially planned (and as corrected after the mid-term evaluation, if any such correction took place). The final evaluation will look at impact and sustainability of results, including the contribution to capacity development and the achievement of global environmental benefits/goals. The TOR for this evaluation will be prepared by the UNIDO Project Manager based on guidance from the UNIDO evaluation group.

The terminal evaluation should also provide recommendations for follow up activities and requires a management response.

During the last 3 months the project team will prepare the Project Terminal Report. This comprehensive report will summarize the results achieved (objectives, outcomes, outputs), lessons learned, problems met and areas where results may not have been achieved. It will also lay out recommendations for any further steps that may need to be taken to ensure sustainability and replicability of the project's results.

Learning and knowledge sharing

Results from the project will be disseminated within and beyond the project intervention zone through existing information sharing networks and forums.

The project will identify and participate, as relevant and appropriate, in meetings and conferences which may be of benefit to project implementation through lessons learned. The project will identify, analyze and share lessons learned that may be beneficial in the design and implementation of similar future projects.

Costs of M&E Activities:

| M&E Activity Categories | Feeds Into | Time Frame | GEF Grant Budget (\$US) | Co-financing Budget (\$US) | Responsible Parties |
|--|---|---|--------------------------------|-----------------------------------|--|
| Measurement GEF Tracking Tool specific indicators | Terminal Evaluation Reports | At completion | 5,000 | 5,000 | <ul style="list-style-type: none"> • Project technical experts & M&E consultants provide feedback to AEDE/PMU; • AEDE/PMU submit inputs for consolidation and approval by project steering committee (PSC) |
| Monitoring of project impact indicators (as per LogFrame) | Project management; Semi-annual progress report; Annual GEF PIR | Semi-annually | 15,000 | 10,000 | |
| Periodic Progress Reports | Project management; Annual GEF PIR | Semi-annually | 5,000 | 5,000 | |
| Independent terminal evaluation | Terminal Evaluation Review (TER) conducted by UNIDO EVA and/or GEF EO | Project completion (at least one month prior to the end of the project and no later than six months after project completion) | 20,000 | 15,000 | Independent evaluator for submission to UNIDO PM |
| Total | | | 45,000 | 35,000 | |

Legal Context

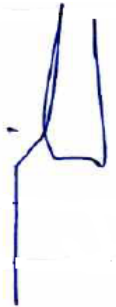
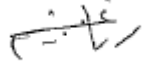
The Government of the Republic of Chad agrees to apply to the present project, mutatis mutandis, the provisions of the Standard Basic Assistance Agreement between the United Nations Development Programme and the Government, signed and entered into force on 14 October 1977.

PART III: APPROVAL/ENDORSEMENT BY GEF OPERATIONAL FOCAL POINT(S) AND GEF AGENCY(IES)

A. RECORD OF ENDORSEMENT OF GEF OPERATIONAL FOCAL POINT (S) ON BEHALF OF THE GOVERNMENT(S): (Please attach the [Operational Focal Point endorsement letter\(s\)](#) with this template. For SGP, use this [OFP endorsement letter](#)).

| NAME | POSITION | MINISTRY | DATE (MM/dd/yyyy) |
|---------------|-----------------------------|-------------------------------------|-------------------|
| Hakim Djibril | GEF Operational Focal Point | MINISTRY OF ENVIRONMENT AND FISHERY | 01/14/2014 |

B. GEF AGENCY(IES) CERTIFICATION

| This request has been prepared in accordance with GEF/LDCF/SCCF/NPIF policies and procedures and meets the GEF/LDCF/SCCF/NPIF criteria for project identification and preparation. | | | | | |
|---|--|--------------------|---|------------------|---------------------|
| Agency Coordinator, Agency name | Signature | DATE (MM/dd/yy yy) | Project Contact Person | Telephone | Email Address |
| Mr. Philippe Scholtès, Managing Director, Programme Development and Development and Technical Cooperation division (PTC) UNIDO GEF Focal Point |  | 30/05/2014 | Ms. Rana Ghoneim, Energy and Climate Change Branch, UNIDO  | +43-1-26026-4356 | r.ghoneim@unido.org |

ANNEX A: PROJECT RESULTS FRAMEWORK (either copy and paste here the framework from the Agency document, or provide reference to the page in the project document where the framework could be found).

| Goal | | | | | | |
|---|---|--|--|---|--|---|
| To ensure environmental sustainability through reducing GHG emissions related to the micro and small-scale food processing sector in Chad | | | | | | |
| Objective | | | | | | |
| To stimulate the market demand for energy efficient cook stoves in traditional agro-food processing industries in Chad with a focus on 2 sub-sectors: traditional sorghum based beer brewing (bili bili, kochat and argui) and meat grilling (tchélé) | | | | | | |
| Outcome 1 | | Indicators | Baseline | Targets | Means of verification | Risks and Assumption |
| 1. Design of cook stoves improved | | % energy efficiency of the improved stoves | Inefficient stoves are used | Stoves adopted improve energy efficiency by 80% | Verification reports | Promoting energy efficient cook stoves & saving firewood is a priority for the Chadian Government |
| Outputs | Activities | Indicators | Baseline | Targets | Means of verification | Risks and Assumption |
| 1.1. Infrastructure for the assembly of stoves and development of new models established | 1.1.1. Develop technology tea and close collaboration between technology experts, Envirofit, local stove manufacturers, distributors, technicians, etc... 1.1.2. Determine the market needs 1.1.3. Identify relevant areas for warehouses, sales and distribution points, technicians to be trained across the intervention zones. 1.1.4. Support the R&D to further develop the tchelegrill prototype and determine local and regional sourcing of raw materials. | EE technology adopted | No clear EE technology for food processing purposes yet used | Improved cook stove technology determined | Evaluation & recommendations report | Cook stove technology needs to be produced locally |
| 1.2. Local cook stove manufacturers trained to efficiently support the EE stove supply | 1.2.1. Train local stove manufacturers on the assembly, installation and maintenance of stoves as well as management skills. | Knowledge sharing with international experts | No exchange on EE technology | At least 2 knowledge sharing partners | Status reports Potential collaboration/ MOUs signs | Producers of improved cook stoves are willing to engage in knowledge sharing, training and development of |

| | | | | | | |
|--|---|--|--|---|---|---|
| | | # of trained cookstove manufacturers | No training of cook stove manufacturers | The 2 existing cookstove manufacturing entities trained | Training reports | EE cook stoves |
| 1.3. Local distribution channels developed and operationalized | <p>1.3.1. Train local distributors via the “Envirofit University”</p> <p>1.3.2. Train women entrepreneurs to empower them and integrate them into the EE stove value chain</p> <p>1.3.3. Ensure efficient functioning of local distribution channels</p> | <p># of distributors operating</p> <p># of women entrepreneurs trained</p> | No distributors & no women entrepreneurs working in the supply chain for clean cook stoves | <p>At least 2 distributors in each geographical zone or cluster</p> <p>At least 25% women entrepreneurs involved in the supply and distribution of stoves</p> | User surveys | The market for improved stoves is attractive for investment. |
| 1.4. Users of EE stoves trained on usage and maintenance of their stoves | 1.4.1. Train users on usage and maintenance of their stoves via local distributors | % of the users efficiently utilizing their stoves | The users do not use the stoves | 90% of the users utilize the stove efficiently | Direct interviews and surveys | Users of the stoves realize the benefit of using the improved stoves |
| Outcome 2 | | Indicators | Baseline | Targets | Means of verification | Risks and Assumption |
| 2. Sustainable financial mechanisms put in place | | % of the beneficiaries applying group-financing schemes | No users apply group financing schemes to finance improved cook stoves | 100% of the users in target zones apply group-financing schemes | User surveys | Mutual trust and interest in the group members to support group-financing |
| Outputs | Activities | Indicators | Baseline | Targets | Means of verification | Risks and Assumption |
| 2.1. Credit and savings mechanism including guarantee scheme for micro-enterprises developed and operational | <p>2.1.1. Raise the awareness of beneficiaries on group savings mechanisms</p> <p>2.1.2. Create subgroups based on determined selection criteria</p> <p>2.1.3. Implement adapted financial schemes for each group</p> <p>2.1.4. Train 2 members in each subgroup on basic accounting skills and administration of the saving scheme</p> | <p>\$ of loans granted</p> <p># of guarantee funds established</p> <p># of cook stoves replaced</p> <p># of good</p> | <p>No investments in EE cookstoves continue in operation</p> <p>No guaranty fund dedicated to food</p> | <p>At least USD 50,000 mobilized per year</p> <p>At least 15 guarantee funds established</p> <p>1500 replaced cook stoves</p> | <p>Regular feedback of stakeholders</p> <p>Training reports</p> <p>Project Status reports</p> | <p>Local financial institutions’ priorities and interests are not the 2 targeted sectors</p> <p>End-users understand the importance of a saving behavior and of guarantee funds</p> <p>Reduction of the life cycle energy costs becomes a priority for micro and small-</p> |

| | | | | | | |
|--|---|--|--|--|---|--|
| | <p>2.1.5. Partner with micro-finance institutions as required.</p> <p>2.1.6. Compile the results and lessons learned from the implementation of these projects & disseminate through different media and building on the experience of the Global Alliance for Clean Cookstoves</p> | <p>practice examples available</p> | <p>processors to support shift to EE cook stoves</p> <p>No EE stoves in the targeted 2 sectors available on the market</p> <p>No best practice examples available</p> | <p>50 good practice examples available</p> <p>Guaranty funds established</p> | | <p>scale food processors</p> |
| <p>2.2. Framework for scaling up the project impact and ensuring sustainable income streams through the voluntary carbon markets developed</p> | <p>2.2.1. Train 20 master project developers on GS project identification and development</p> <p>2.2.2. Develop and support the operation of a national information platform to disseminate information on carbon market</p> <p>2.2.3. Support matchmaking between the buyers and sellers of carbon credits, pooling of credits and the creation of an equitable revenue sharing scheme.</p> <p>2.2.4. Support linking up with identified regional POAs</p> | <p># of project developers trained</p> <p># of project operators trained</p> <p>Monitoring entity selected and capacity built</p> <p>Monitoring methodology developed Platform established</p> | <p>No project developers available locally</p> <p>Project operators not aware of monitoring requirements</p> <p>No adapted methodology yet developed and monitored No platform available</p> | <p>20 project developers trained (out of which 30% women)</p> <p>30 project operators trained (Out of which 30% women) Monitoring entity chosen and strengthened incl. developed relevant monitoring methodology for EE cook stoves 1 platform established</p> | <p>Regular feedback of stakeholders</p> <p>Training reports</p> <p>Project Status reports</p> | <p>Qualified entities are identified to act as the DOE and CME</p> <p>Relevant local monitoring entity identified</p> <p>Qualified entities are active and willing to exchange on the dedicated platform</p> |
| Outcome 3 | | Indicators | Baseline | Targets | Means of verification | Risks and Assumption |
| Business performance of micro-enterprises improved through clustering | | % of Cluster members improve their | Limited profits | Cluster members improve their | User surveys | Cook stoves replaced are occurring due to improved market conditions |

| | | business performance and profits | | business performance and profits by at least 40% | | |
|--------------------------------------|---|--|---|---|--|--|
| Outputs | Activities | Indicators | Baseline | Targets | Means of verification | Risks and Assumption |
| 3.1. Cluster Diagnostic conducted | 3.1.1. Perform a detailed cluster diagnostic report that identifies the enterprise number, location, characteristics, process/flow charts, turnover, cost structure, profit margins, issues, etc... | # of clusters associations formalized | No clusters association available | At least 2 cluster association formalized (60% women) | Feedback of stakeholders Visits of the CDAs Progress reports Minutes of meeting | Micro and small-scale food processors endorse the cluster concept |
| 3.2. Cluster action plan implemented | 3.2.1. Create associations and legally registered groups for the two targeted food processing sectors 3.2.2. Link associations to EE cook stove manufacturers/distributors to support the dissemination of EE stoves | Increase in the number of EE cook stoves sold per year | No increase in the sale of EE cook stoves | At least 500 cook stoves sold per year (60% women) | Feedback of stakeholders Visits of the CDAs Progress reports Minutes of meeting | |
| 3.3. Members of the cluster trained | 3.3.1. Train entrepreneurs on the benefits of the cluster approach, improving their business performance, joint procurement and collective efficiency. | # of cluster members trained | No training in newly created clusters | 80% of cluster members trained (60% women) | Training reports Study report | Food processors members of clusters are willing to engage in training and skills development |

| | | | | | | |
|--|---|------------------------------|--|--|------------------|--|
| 3.4. Awareness of the cluster members improved | 3.4.1. Hold awareness raising sessions to disseminate information on the benefits of clustering and the benefits of adopting improved cook stoves | # of cluster members trained | No awareness in newly created clusters | 80% of cluster members participate in awareness sessions (60% women) | Workshop reports | Food processors members of clusters are willing to engage in training and skills development |
|--|---|------------------------------|--|--|------------------|--|

ANNEX B: CALCULATION OF GHG EMISSION REDUCTIONS

The estimation of future emission reductions is based on Small Scale Methodology AMSII.G., Version 3 (which can also be used for Gold Standard Projects):

It is assumed that in the absence of the project activity, the baseline scenario would be the use of fossil fuels for meeting similar thermal energy needs.

Emission reductions would be calculated as:

$$ER_y = B_{y,savings} * f_{NRBy} * NCV_{biomass} * EF_{projected\ fossil\ fuel} \quad (1)$$

Where:

| | |
|--------------------------------|---|
| ER_y | Emission reductions during the year y in tCO ₂ e |
| $B_{y,savings}$ | Quantity of woody biomass that is saved in tons |
| f_{NRBy} | Fraction of woody biomass saved by the project activity in year y that can be established as non-renewable biomass |
| $NCV_{biomass}$ | Net calorific value of the non-renewable woody biomass that is substituted (IPCC default for wood fuel, 0.015 TJ/ton) |
| $EF_{projected\ fossil\ fuel}$ | Emission factor for the substitution of non-renewable woody biomass by similar consumers. Use a value of 81.6 tCO₂/TJ⁴ |

$B_{y,savings}$ is estimated by applying relevant Option 2, paragraph 6 of AMS-II.G Ver. 3:

$$B_{y,savings} = B_{old} * (1 - \eta_{old} / \eta_{New}) \quad (2)$$

Where:

| | |
|--------------|---|
| B_{old} | Quantity of woody biomass used in the absence of the project activity in tons |
| η_{old} | <ol style="list-style-type: none"> Efficiency of the system being replaced, measured using representative sampling methods or based on referenced literature values (fraction), use weighted average values if more than one type of system is being replaced; A default value of 0.10 may be optionally used if the replaced system is a three stone fire, or a conventional system with no improved combustion air supply or flue gas ventilation system, i.e. without a grate or a chimney; for other types of systems a default value of 0.2 may be optionally used |

⁴ This value represents the emission factor of the substitution fuels likely to be used by similar users, on a weighted average basis. It is assumed that the mix of present and future fuels used would consist of a solid fossil fuel (lowest in the ladder of fuel choices), a liquid fossil fuel (represents a progression over solid fuel in the ladder of fuel use choices) and a gaseous fuel (represents a progression over liquid fuel in the ladder of fuel use choices). Thus a 50% weight is assigned to coal as the alternative solid fossil fuel (96 tCO₂/TJ) and a 25% weight is assigned to both liquid and gaseous fuels (71.5 tCO₂/TJ for Kerosene and 63.0 tCO₂/TJ for Liquefied Petroleum Gas (LPG)).

η_{new} Efficiency of the system being deployed as part of the project activity (fraction), as determined using the Water Boiling Test (WBT) protocol. Use weighted average values if more than one type of system is being introduced by the project activity

Assumptions:

B_{old} is determined by calculating the product of the number of systems (stoves) multiplied by the estimated average annual consumption of woody biomass per appliance (tons/year) (as per Option (a), paragraph 7). This can be derived from historical data or a survey of local usage,

$$B_{old} = (500 \text{ stoves} \times 16.79 \text{ tons wood}^5/\text{stove per year for tchéle operators}) \\ + (1000 \text{ stoves} \times 5.60 \text{ tons wood}^6/\text{stove per year for beer brewers}) \rightarrow$$

$$\eta_{old} = 10\% \text{ (default value)}$$

$$\eta_{new} = 35\%$$

$$B_{y,savings} = 13,995 \times (1 - 0.29) = 9,936.45 \text{ tons}$$

$$f_{NRB,y} = NRB / (NRB + DRB) \quad (3)^7$$

which is the ratio of Non Renewable Biomass (NRB) approved by the DNA and the UNFCCC CDM EB⁸ and the total biomass used which is the sum of Non Renewable Biomass (NRB) and Demonstrably Renewable Biomass (DRB).

Assumptions:

In this estimation it is assumed that Demonstrably Renewable Biomass is 0.

$$NRB = 92\%$$

$$DRB = 0$$

$$f_{NRB,y} = 0.92 / 0.92 + 0 = 1$$

Therefore applying above mentioned assumptions this would result in yearly emission reductions of

$$ER_y = 9,936.45 \text{ t} \times 1 \times 0.015 \text{ TJ/t} \times 81.6 \text{ tCO}_2/\text{TJ} = \mathbf{12,162 \text{ tCO}_2}$$

⁵ Average Annual consumption of woody biomass for tchéle operators (based on the feasibility study Q3 2013)

⁶ Average Annual consumption of woody biomass for beer brewers (based on the feasibility study Q3 2013)

⁷ Woody biomass is “renewable” if one of the following two conditions is satisfied: (I) The woody biomass is originating from land areas that are forests where: (a) The land area remains a forest; **and** (b) sustainable management practices are undertaken on these land areas to ensure, in particular, that the level of carbon stocks on these land areas does not systematically decrease over time (carbon stocks may temporarily decrease due to harvesting); **and** (c) any national or regional forestry and nature conservation regulations are complied with. (II) The biomass is woody biomass and originates from non-forest areas (e.g., croplands, grasslands) where: (a) the land area remains as non-forest or is reverted to forest; and (b) sustainable management practices are undertaken on these land areas to ensure in particular that the level of carbon stocks on these land areas does not systematically decrease over time (carbon stocks may temporarily decrease due to harvesting); and any national or regional forestry, agriculture and nature conservation regulations are complied with.

⁸ <http://cdm.unfccc.int/DNA/fNRB/index.html> (seen on 11/5/2013)

Annex C: Project Budget Breakdown

GEF Budget Breakdown by component

| Component Based Budget for the GEF Grant | | | | | |
|---|----------------------------------|---------|--------|--------|--------------|
| GEF Grant Budget Component 1 | | | | | |
| Component 1 | Type of Expense | Yr 1 | Yr 2 | Yr 3 | Output Total |
| | International Expertise | 16,000 | 16,000 | 16,000 | 48,000 |
| | Local Travel | 5,000 | 5,000 | 5,000 | 15,000 |
| | National Expertise | 20,000 | 20,000 | 20,000 | 60,000 |
| | Contractual Arrangement | | | | |
| | Training/Workshops | 25,000 | 25,000 | 20,000 | 70,000 |
| | International Meetings/Workshops | 10,000 | 10,000 | 7,000 | 27,000 |
| | Miscellaneous | | | | |
| TOTAL Component 1 | | 76,000 | 76,000 | 68,000 | 220,000 |
| GEF Grant Budget Component 2 | | | | | |
| Component 2 | Type of Expense | Yr 1 | Yr 2 | Yr 3 | Output Total |
| | International Expertise | 15,000 | 15,000 | 15,000 | 45,000 |
| | National Expertise | 5,000 | 5,000 | 5,000 | 15,000 |
| | Training/Workshops | 10,000 | 10,000 | 5,000 | 25,000 |
| | Equipment | 5,000 | | | 5,000 |
| TOTAL Component 2 | | 35,000 | 30,000 | 25,000 | 90,000 |
| GEF Grant Budget Component 3 | | | | | |
| Component 3 | Type of Expense | Yr 1 | Yr 2 | Yr 3 | Output Total |
| | National Expertise | 30,000 | 30,000 | 30,000 | 90,000 |
| | Contractual Arrangement | 50,000 | 50,000 | 20,000 | 120,000 |
| | Training/Workshops | 10,000 | 10,000 | 10,000 | 30,000 |
| | Equipment | 10,000 | | | 10,000 |
| TOTAL Component 3 | | 100,000 | 90,000 | 60,000 | 250,000 |
| GEF Grant Budget MNE | | | | | |
| MNE | Type of Expense | Yr 1 | Yr 2 | Yr 3 | Output Total |
| | Contractual Arrangement | 10,000 | 10,000 | 25,000 | 45,000 |
| TOTAL Component MNE | | 10,000 | 10,000 | 25,000 | 45,000 |
| GEF Grant Budget Project Management | | | | | |
| Project Management | Type of Expense | Yr 1 | Yr 2 | Yr 3 | Output Total |
| | National Expertise | 18,200 | 18,200 | 18,200 | 54,600 |
| | Miscellaneous | 1,800 | 1,800 | 1,800 | 5,400 |
| TOTAL Component Project Management | | 20,000 | 20,000 | 20,000 | 60,000 |

Project Management Unit

| Position / title | \$ / person week | Estimated person weeks | Total (\$) | Tasks |
|--------------------------|------------------|------------------------|---------------|---|
| National Project Manager | 350 | 156 | 54,600 | Under the supervision of the UNIDO Project Manager, the NPC will be responsible for the day-to-day management of the implementation of the project including all programme and administrative matters, and also the Project Management Unit (PMU), to ensure that the project is effectively and smoothly implemented as described in the project document, and that proper and effective communication with all the stakeholders is carried out. |
| Total | | | 54,600 | |

National Consultants

| Position / title | \$ / person week | Estimated person weeks | Total (\$) | Tasks |
|----------------------------|------------------|------------------------|----------------|--|
| Cluster Development Agents | 300 | 300 | 90,000 | Undertake a cluster diagnostic study to identify the characteristics, opportunities and constraints within the cluster. In addition, the CDAs support the preparation and implementation of a cluster action plan and monitoring of the activities within the cluster. |
| Communication expert | 300 | 50 | 15,000 | Organise information and awareness stimulation activities; capture lessons learned and best practices and assist in their dissemination; Support the operation of the knowledge platform under the carbon markets. |
| Technical experts | 500 | 120 | 60,000 | Undertake the dissemination and the local training on improved cook stoves at selected enterprises and the development and assembly of new stoves. |
| MNE experts | 500 | 40 | 20,000 | Monitoring of the project activities against the GEF tracking tool and providing inputs to the terminal evaluation. |
| Total | | | 185,000 | |

International Consultants

| Position / title | \$ / person week | Estimated person weeks | Total (\$) | Tasks |
|-----------------------------|------------------|------------------------|---------------|---|
| Trainers on improved stoves | 1,600 | 30 | 48,000 | Training of trainers on the design and assembly of improved energy efficient cook stoves. |
| Carbon market consultants | 1,500 | 20 | 30,000 | Support the development of tailored training material for project developers on developing cook stove projects under the voluntary carbon markets, delivering the training and proposing related M&V framework. |
| Financial expert | 1,500 | 10 | 15,000 | Advise on innovative finance mechanisms to support EE cook stoves; assist with financial evaluation of EE projects; provide corresponding training to entrepreneurs or local financial institutions. |
| Total | | | 93,000 | |

Co-financing budget breakdown by co-financing source

| Proposed Co-financing Budget | | | | | | |
|-----------------------------------|----------------------------------|---------|-----------|------------------|-------------------------------|--------------|
| Co-financing Budget Component 1 | | | | | | |
| Component 1 | Type of expense | UNIDO | Envirofit | Shell Foundation | Ministry of Environment, Chad | Output Total |
| | International Expertise | | 50,000 | 30,000 | | 80,000 |
| | Local Travel | | | | 50,000 | 50,000 |
| | National Expertise | | | | 120,000 | 120,000 |
| | Contractual Arrangement | | | | 160,000 | 160,000 |
| | Training/Workshops | | 20,000 | 20,000 | 50,000 | 90,000 |
| | International Meetings/Workshops | | | | | |
| TOTAL Component 1 | | | 70,000 | 50,000 | 380,000 | 500,000 |
| Co-financing Budget Component 2 | | | | | | |
| Component 2 | Type of expense | UNIDO | Envirofit | Shell Foundation | Ministry of Environment, Chad | Output Total |
| | International Expertise | | 40,000 | | | 40,000 |
| | National Expertise | | | | 60,000 | 60,000 |
| | Contractual Arrangement | | | | 1,100,000 | 1,100,000 |
| | Training/Workshops | 20,000 | 20,000 | 20,000 | 40,000 | 100,000 |
| TOTAL Component 2 | | 20,000 | 60,000 | 20,000 | 200,000 | 1,300,000 |
| Co-financing Budget Component 3 | | | | | | |
| Component 3 | Type of expense | UNIDO | Envirofit | Shell Foundation | Ministry of Environment, Chad | Output Total |
| | International Expertise | 180,000 | | | | 180,000 |
| | Local Travel | | | | 30,000 | 30,000 |
| | National Expertise | | | | 100,000 | 100,000 |
| | Contractual Arrangement | | | | 100,000 | 100,000 |
| | Training/Workshops | | | 40,000 | 50,000 | 90,000 |
| | International Meetings/Workshops | 100,000 | | | | 100,000 |
| TOTAL Component 3 | | 280,000 | | 40,000 | 280,000 | 600,000 |
| Co-financing Budget Component MNE | | | | | | |
| Component MNE | Type of expense | UNIDO | Envirofit | Shell Foundation | Ministry of Environment, Chad | Output Total |
| | National Expertise | | | | 10,000 | 10,000 |
| | International Expertise | 35,000 | | | | 35,000 |
| TOTAL Component MNE | | 35,000 | | | | 45,000 |

| Co-financing Budget Project Management | | | | | | |
|---|------------------------|--------|-----------|------------------|-------------------------------|---------------------|
| Component Project management | Type of expense | UNIDO | Envirofit | Shell Foundation | Ministry of Environment, Chad | Output Total |
| | Travel | 25,000 | | | 40,000 | 65,000 |
| | National Expertise | | | | 35,000 | 35,000 |
| | Equipment | | | | 5,000 | 5,000 |
| | Office space | | | | 50,000 | 50,000 |
| TOTAL Project Management | | 25,000 | | | 140,000 | 155,000 |

Annex D – Project 3 year timetable

| Outcome | Output | Activity | Year 1 | | | | Year 2 | | | | Year 3 | | | |
|---|---|---|--------|----|----|----|--------|----|----|----|--------|----|----|----|
| | | | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 |
| 1. Improving the design of cook stoves to achieve the optimum fuel efficiency | 1.1. Infrastructure for the assembly of stoves and development of new models established | 1.1.1. Develop technology team and close collaboration between technology experts: Envirofit, two existing local EE cook stove developers and other local cook stove manufacturers | | | | | | | | | | | | |
| | | 1.1.2. Determine the needs of food processors (observations, focus groups/interviews) | | | | | | | | | | | | |
| | | 1.1.3. Identify relevant areas for warehouses, sales and distribution points, technicians to be trained across the intervention zones | | | | | | | | | | | | |
| | | 1.1.4. Support the R&D to further develop the tchelegrill prototype and determine local and regional sourcing of raw materials | | | | | | | | | | | | |
| | 1.2. Identified local cook stove manufacturers trained to efficiently support the EE stove supply | 1.3.1. Train identified partnering local stoves manufacturers on the new technology (incl. usage and maintenance) as well as management skills (incl. marketing, sales & after-sales and quality control) | | | | | | | | | | | | |
| 1.3. Local distribution channels developed, | 1.3.1. Identify potential local distributors across | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | | |
|--|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| | trained and operational | the intervention zones | | | | | | | | | | | | | | | | | | |
| | | 1.3.2. Train identified local distributors via the “Envirofit University” | | | | | | | | | | | | | | | | | | |
| | | 1.3.3. Train women entrepreneurs to empower them and integrate them into the EE stove value chain (manufacturing, management, sales/marketing) | | | | | | | | | | | | | | | | | | |
| | | 1.3.4. Ensure efficient functioning of local distribution channels (incl. effective marketing, sales & after-sales) | | | | | | | | | | | | | | | | | | |
| | 1.4. Users of EE stoves trained on usage and maintenance of their stoves | 1.4.1. Train users on usage and maintenance of their stoves via local distributors | | | | | | | | | | | | | | | | | | |
| 2. Creating sustainable financing mechanisms | 2.1. Credit & savings mechanism incl. guaranty scheme for micro-enterprises developed and operational | 2.1.1. Raise awareness on credit & savings mechanism with beneficiaries | | | | | | | | | | | | | | | | | | |
| | | 2.1.2. Create subgroups based on determined selection criteria | | | | | | | | | | | | | | | | | | |
| | | 2.1.3. Implement adapted financial scheme for each subgroup | | | | | | | | | | | | | | | | | | |
| | | 2.1.4. Train two members per subgroups to basic accounting skills and efficient financial scheme | | | | | | | | | | | | | | | | | | |
| | | 2.1.5. Partner with micro-finance institutions as required | | | | | | | | | | | | | | | | | | |
| | 2.2. Framework for | 2.2.1. Train 20 master | | | | | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | |
|--|---|---|--|--|--|--|--|--|--|--|--|--|--|--|
| | scaling up the project impavys and ensuring sustainable income streams through voluntary carbon markets developed | project developers on GS project identification and development | | | | | | | | | | | | |
| | | 2.2.2. Develop and support the operation of a national platform to disseminate information on carbon markets | | | | | | | | | | | | |
| | | 2.2.3. Support matchmaking between buyers and sellers, pooling of credits and the creation of an equitable revenue sharing mechanism | | | | | | | | | | | | |
| | | 2.2.4. Support linking up with identified regional PoAs (incl. contracts) | | | | | | | | | | | | |
| 3. Improving the business performance of enterprises | 3.1. Cluster Diagnostic | 3.1.1. Perform a detailed cluster diagnostic report that identifies the enterprises/number, localization, characteristics, processes/flow charts, turnover, cost structure, profit margin, issues | | | | | | | | | | | | |
| | 3.2. Cluster Action Plan | 3.2.1. Create associations and legally registered groups for the two targeted food processing sectors 3.2.2. Link associations to EE cook stove manufacturers/distributors to support the dissemination of EE stoves | | | | | | | | | | | | |
| | 3.3. Training to members of the cluster | 3.3.1. Train entrepreneurs on benefits of the cluster approach, improving their | | | | | | | | | | | | |

| | | | | | | | | | | | | | | |
|--|------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|
| | | business performance, joint procurement & collective efficiency | | | | | | | | | | | | |
| | 3.4. Awareness Raising | 3.4.1. Hold awareness raising activities to disseminate the benefits of clustering and the benefits of adopting improved cook stoves | | | | | | | | | | | | |

ANNEX E: ESTIMATION OF CASH FLOWS FROM VOLUNTARY CARBON MARKETS

According to a study commissioned by the Global Alliance for Clean Cookstoves, market prices for clean cook stove certificates are around 5-6 EUR.

Nevertheless, they can be significantly higher depending on the project type, the motivation of the buyer, the amount of certificates, the demand as well as the supply, etc.

The forecasted price was thus set to 6 EUR.

| VER related Cash Flows (EURO) | | | | | | | | | | | | | | | | | | | | | | | | | | Sum |
|--|-------|---|----------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|------------|
| Year | | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | | |
| | | 1 | 2 | | | | | | | | | | | | | | | | | | | | | | | |
| Income | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Estimated VERs Generation | | | 12,162 | 12,162 | 12,162 | 12,162 | 12,162 | 12,162 | 12,162 | 12,162 | 12,162 | 12,162 | 12,162 | 12,162 | 12,162 | 12,162 | 12,162 | 12,162 | 12,162 | 12,162 | 12,162 | 12,162 | 12,162 | 12,162 | 12,162 | 121,620 |
| Deduction Gold Standard Issuance Fee | 0.02 | | 11,919 | 11,919 | 11,919 | 11,919 | 11,919 | 11,919 | 11,919 | 11,919 | 11,919 | 11,919 | 11,919 | 11,919 | 11,919 | 11,919 | 11,919 | 11,919 | 11,919 | 11,919 | 11,919 | 11,919 | 11,919 | 11,919 | 11,919 | |
| Price/VER | 6 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Income (0.5 year lag to Generation) | | | 0 | 71,513 | 71,513 | 71,513 | 71,513 | 71,513 | 71,513 | 71,513 | 71,513 | 71,513 | 71,513 | 71,513 | 71,513 | 71,513 | 71,513 | 71,513 | 71,513 | 71,513 | 71,513 | 71,513 | 71,513 | 71,513 | 71,513 | 1,501,764 |
| Costs | | | | | | | | | | | | | | | | | | | | | | | | | | |
| PIN | | 0 | | | | | | | | | | | | | | | | | | | | | | | | 0 |
| PDD/MP/Validation Support/Registration | | 0 | -50,000 | | | | | | | | | | | | | | | | | | | | | | | -50,000 |
| Negotiation/Brokerage | 0.045 | | 0 | -3,218 | -3,218 | -3,218 | -3,218 | -3,218 | -3,218 | -3,218 | -3,218 | -3,218 | -3,218 | -3,218 | -3,218 | -3,218 | -3,218 | -3,218 | -3,218 | -3,218 | -3,218 | -3,218 | -3,218 | -3,218 | -3,218 | -67,579 |
| Validation | | | -50,000 | | | | | | | | | | | | | | | | | | | | | | | -100,000 |
| Monitoring Reports/Verification Support | | | 0 | -25,000 | -25,000 | -25,000 | -25,000 | -25,000 | -25,000 | -25,000 | -25,000 | -25,000 | -25,000 | -25,000 | -25,000 | -25,000 | -25,000 | -25,000 | -25,000 | -25,000 | -25,000 | -25,000 | -25,000 | -25,000 | -25,000 | -525,000 |
| Verification | | | | -25,000 | -25,000 | -25,000 | -25,000 | -25,000 | -25,000 | -25,000 | -25,000 | -25,000 | -25,000 | -25,000 | -25,000 | -25,000 | -25,000 | -25,000 | -25,000 | -25,000 | -25,000 | -25,000 | -25,000 | -25,000 | -25,000 | -525,000 |
| GS Account Annual Fee (500 USD) | | | | -393 | -393 | -393 | -393 | -393 | -393 | -393 | -393 | -393 | -393 | -393 | -393 | -393 | -393 | -393 | -393 | -393 | -393 | -393 | -393 | -393 | -393 | |
| Issuance Registry Fee (0.05 USD/t GSVER) | 0.05 | | | -468 | -468 | -468 | -468 | -468 | -468 | -468 | -468 | -468 | -468 | -468 | -468 | -468 | -468 | -468 | -468 | -468 | -468 | -468 | -468 | -468 | -468 | |
| Total Costs | | 0 | -100,000 | 0 | -54,079 | -54,079 | -54,079 | -54,079 | -54,079 | -54,079 | -79,079 | -54,079 | -54,079 | -54,079 | -54,079 | -54,079 | -54,079 | -79,079 | -54,079 | -54,079 | -54,079 | -54,079 | -54,079 | -54,079 | -54,079 | -1,267,579 |
| Earnings before taxes | | 0 | -100,000 | 0 | 17,434 | 17,434 | 17,434 | 17,434 | 17,434 | 17,434 | -7,566 | 17,434 | 17,434 | 17,434 | 17,434 | 17,434 | 17,434 | -7,566 | 17,434 | 17,434 | 17,434 | 17,434 | 17,434 | 17,434 | 17,434 | 234,184 |

The earning could be notably increased and obtained earlier when linking up with advanced PoAs e.g. under registration or already operational. The project aims at identifying such potential PoAs and support local projects to integrate these PoAs (component 4).

Annex F – GEF OFP Endorsement letter

REPUBLIQUE DU TCHAD
 PRESIDENCE DE LA REPUBLIQUE
 PRIMATURE
 MINISTERE DE L'ENVIRONNEMENT
 ET DES RESSOURCES HALIEUTIQUES
 SECRETARIAT GENERAL
 POINT FOCAL OPERATIONNEL FEM
 N° 001/PR/PM/MERH/SG/PFO FEM/2014

UNITE-TRAVAIL-PROGRES

Mardi, le 14 Janvier 2014

To : Mr, Philippe Scholtes
 Officer-in-charge Managing Director PTC
 UNIDO GEF Focal Point

Subject : Endorsement for Promoting energy efficient cook stoves in micro and small-scale food Processing industries

In my capacity as GEF Operational Focal Point for the Republic of Chad, I confirm that the above Project proposal (a) is in accordance with my government's national priorities including the priorities identified in STAR and the National Adaptation Plan of Action and our commitment to the relevant Global environmental conventions; and (b) was discussed with relevant stakeholders, including the global environmental convention focal points.

I am pleased to endorse the preparation of the above project proposal with the support the GEF Agency (ies) listed below. If approved, the proposal will be prepared and implemented by UNIDO. I request the GEF Agency (ies) to provide a copy of the project document before it is submitted To the GEF Secretariat for CEO endorsement.

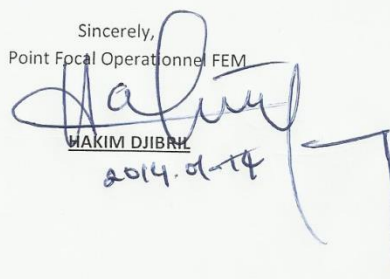
The total financing (from GEFTF, LDCF, SCCF and/or NPIF) being requested for this project is US\$728, 175, inclusive of project preparation grant (PPG), if any, and Agency fees for project cycle management services associated with the total GEF grant. The financing requested for the Republic of Chad is detailed in the table below:

| Source Of Funds | GEF Agency | Focal Area | Amount in (US\$) | | | |
|----------------------------|------------|------------|---------------------|----------------|---------------|----------------|
| | | | Project preparation | Project | Fee | Total |
| GEFTF | UNIDO | CC | 0 | 665,000 | 63,175 | 728,175 |
| select | select | select | | | | 0 |
| select | select | select | | | | 0 |
| select | select | select | | | | 0 |
| Total GEF Resources | | | 0 | 665,000 | 63,175 | 728,175 |

[WHERE THE SOURCE OF FUNDING IS GEF TRUST FUND ONLY (I.E. EXCLUDING LDCF AND/OR SCCF) AND THE FOCAL AREA FALLS UNDER THE STAR MODEL, INCLUDE THE FOLLOWING:

I consent to the utilization of the Republic of Chad's allocations in GEF-5 as defined in the System for Transparent Allocation of Resources (STAR).]

Sincerely,
 Point Focal Operationnel FEM


 WAKIM DJIBRI
 2014.01.14

Annex G: Co-financing letters

REPUBLIQUE DU TCHAD

PRESIDENCE DE LA REPUBLIQUE

PRIMATURE

MINISTRE DE L'ENVIRONNEMENT
ET DES RESSOURCES HALIEUTIQUES

SECRETARIAT GENERAL

AGENCE POUR L'ENERGIE DOMESTIQUE
ET L'ENVIRONNEMENT



UNITE - TRAVAIL - PROGRES

N° 481 MERH/SG/AEDE/2013

N'Djamena, le

Le Ministre de l'Environnement et des Ressources Halieutiques

A
Monsieur Philippe Scholtès
Directeur Chargé de la Division de l'élaboration
des Programmes et de la Coopération Technique
Organisation des Nations Unies pour le Développement Industriel
Centre International de Vienne
PO Box 300-A-1400 Vienne
- AUTRICHE -

Objet : Promotion des foyers énergétiquement efficace pour le secteur des micro-entreprises au Tchad

Le Ministère de l'Environnement et des Ressources Halieutiques de la République du Tchad appuie l'initiative de l'Organisation des Nations Unies pour le Développement Industriel (ONUDI) pour le lancement du « *Projet Promotion des foyers énergétiquement efficace pour le secteur des micro-entreprises au Tchad* » qui sera mis en œuvre par l'Agence pour l'Energie Domestique et l'Environnement (AEDE).

La mise en œuvre de ce projet contribuera à réduire la pression sur les forêts, favorisera la conservation des ressources naturelles et par conséquent, l'atténuation du changement climatique. En outre, le Projet permettra la promotion des secteurs de la grillade et de la brasserie traditionnelle dans le but d'augmenter leur compétitivité et leur offrira des larges possibilités de coopération et de partenariat futur avec les autres secteurs privés.

Le Ministère sera heureux de coopérer avec l'ONUDI à la mise en œuvre de ce projet et est prêt à contribuer au cofinancement à hauteur de 1.000.000 USD (soit 500.000.000 FCFA) durant les trois ans de vie du projet. La contribution annuelle sera programmée en termes d'activités dans le budget de l'AEDE.

A cet effet pour l'année 2014 un montant de 120 000 000 FCFA (240.000 USD) a été alloué à ce projet dans le budget de l'AEDE.

Je vous prie de recevoir, Monsieur le Directeur General, l'assurance de mes meilleures salutations et de ma franche collaboration.


MAHAMAT ISSA HALIKIMI





Making the world fit for humanity

March 7, 2014

Philippe Scholtes
Officer in Charge
Programme development and technical cooperation division
UNIDO

Dear Mr. Phillippe Scholtes:

On behalf of Envirofit International, Inc., I am writing this letter to confirm our support and involvement with your programs in Chad. We appreciate the invitation for involvement and look forward to providing resources for implementation, training and development of improved cooking systems to meet the needs of the Chad communities affected. The total financial contribution of Envirofit is estimated \$130,000 USD in combined (\$40,000 *cash* and \$90,000 *in-kind*) contribution to support realization of the project.

We are aligned with your commitment to improve air quality, reduce deforestation and provide cooking systems that have been designed and tested to excel in performance and reliability for large volume liquids cooking. We are honored to be invited to implement this institutional stoves program and to provide research and training for the grill cooking needs, as well.

Our international team is happy to avail themselves of the project at hand, and we look forward to providing the resources as outlined in your project document to ensure your success.

Best regards,

A handwritten signature in black ink, appearing to read "Tim Bauer".

Tim Bauer
VP of Sales & Business Development



**SHELL
FOUNDATION**

Mr Philippe Scholtes
Officer in Charge
United Nations Industrial Development Organisation (UNIDO)
Programme and Technical Cooperation Division
Vienna International Centre
Wagramerstrasse 5
A-1400 Vienna
Austria

Shell Foundation
40 Bank Street
Canary Wharf
London E14 5NR
United Kingdom
Tel +44 207 934 5496
Fax +44 207 934 7348
Email chris.west@shell.com
Internet <http://www.shellfoundation.org>

12 March 2014

Dear Mr Scholtes

Shell Foundation is committed to developing the institutional stove market in Africa.

We have already provided funding of US\$500,000 to complete the product development and support sales and have leveraged an additional US\$500,000 from the OPEC Fund for International Development (OFID) to build capacity. In addition to this monetary support, Shell Foundation will provide in-kind support for UNIDO's initiative to introduce cleaner cookstoves into Africa – with an initial focus on Chad and Burkina Faso.

The in-kind support to be provided by Shell Foundation will comprise:

- An initial trip to Chad with UNIDO to understand the challenges (including people, market and competitors) and most importantly what is being used at present and what the benefits would be of an improved product. If appropriate and if required, a second trip to evaluate the pilot results will be undertaken and will include educational workshops on distribution, the business model and design.
- Allocation of time from members of the Shell Foundation team (including Deputy Director, Business Development Adviser and Communications) in order to structure the pilot programme including decisions on roles of the partners, logistics required and terms of reference.
- Managing the relationship between UNIDO and Envirofit.
- Managing training of local partners i.e. introducing a virtual educational platform to educate local distributors (Envirofit University).
- Sharing and implementing Shell Foundation's lessons learned to create relevant social marketing material, distribution and financing models.
- Developing a business plan (together with Envirofit, UNIDO and local distributors for scale up after pilot - with the inclusion of a carbon programme). This will include mapping and managing relationships with relevant in-country stakeholders with UNIDO that will be relevant for the scale up.

Shell Foundation is a charitable company limited by guarantee
Registered in England number 4007273 Registered Charity number 1080999
VAT Registration number GB 235 7632 55 1147
Registered Office: Shell Centre London United Kingdom SE1 7NA

- If appropriate (depending on volumes disseminated and geographies) SF would support with a third-party monitoring/field sampling exercise to be conducted by Berkeley Air who are experts in the field of Indoor Air Pollution data analysis.

We look forward to working with you.

Yours sincerely



Chris West
Director, Shell Foundation

REPUBLIQUE DU TCHAD

PRESIDENCE DE LA REPUBLIQUE

PRIMATURE

MINISTERE DE L'ENVIRONNEMENT
ET DES RESSOURCES HALEUTIQUES

SECRETARIAT GENERAL

POINT FOCAL OPERATIONNEL - FEM

N° ___/MERH/SG/PFO-FEM/2014

UNITE/TRAVAIL/PROGRES



N'djamena, le 26 Mars 2014

A
Monsieur Philippe Scholtès
Directeur Chargé de la Division de l'élaboration
Des Programmes et de la Coopération Technique
Organisation des Nations Unies pour le Développement Industriel
Centre International de Vienne
PO Box 300-A-1400 Vienne
-Autriche-

Subject: Mobilisation des Producteurs pour le projet Foyers Améliorés énergétiquement pour les secteurs micro-entreprises.

En ma qualité de Point Focal Opérationnel du Fonds pour l'Environnement Mondial (FEM) du Tchad, je confirme que j'aiderai à mobiliser les producteurs de bili bili et de tchéli d'acquérir 1500 foyers améliorés dont 1000 pour la production de bili bili et 500 pour la production de tchéli. Le coût d'acquisition des foyers est approximativement de 1000 000\$.

Le Gouvernement du Tchad, pour sa part s'engagera à travers l'Agence pour l'Energie Domestique et Environnement (AEDE) qui est l'organe d'exécution du projet faisant aussi partie intégrante du cofinancement du Ministère de l'Environnement et des Ressources Halieutiques participera au soutien des activités de mobilisation des producteurs à acquérir les 1500 foyers sur la durée du projet.

Sincerely,

LE POINT FOCAL OPERATIONNEL DU FEM

HAKIM DJIBRIL

A handwritten signature in black ink, appearing to read 'Hakim Djibril', written over a horizontal line.