

Concept Summary

for the development of an organization providing renewable energy and technology transfer services at the grassroots level in East Africa

Background – Statement of the Problem

According to World Bank statistics, there are an estimated 1.6 billion individuals in the world without access to modern energy services including electricity. In rural and peri-urban areas of East Africa, approximately 80% of the population or 18.8 million households earning \$1-2 per day spend up to 50% of their monthly income on traditional energy sources and energy related services for basic household lighting and cooking needs.

Although the energy problems of the urban and rural poor are well known, they are seldom addressed directly. Until recently, governments, politicians and foreign organizations have generally concentrated on expensive, large scale energy projects and top down solutions as development goals. Large segments of the population which are geographically or financially disadvantaged due to their remoteness or inability to pay are basically ignored – forcing them to resort to traditional energy sources for a lack of better alternatives.

The use of traditional energy sources for lighting and cooking is characterized by the inefficient and dirty consumption of large amounts of biomass fuels such as fuel wood, dung and kerosene oil. The detrimental effects of these fuels are numerous. In addition to increased safety hazards, lower economic productivity, lack of light in the evening, poor information access and environmental damage, these energy sources cause very serious health problems predominantly among women and children. The World Health Organization estimates that indoor air pollution is responsible for over 1.6 million premature deaths a year due to respiratory diseases. Indoor air pollution is the most lethal killer after malnutrition, unsafe sex and the lack of safe drinking water and sanitation (WHO Factsheet no. 292, June 2005).

If affordable, clean energy alternatives can be made available to the majority of biomass fuel users, a win-win situation can be achieved for both suppliers and beneficiaries alike.

(small) Solution

Provide affordable, reliable and appropriate clean energy technologies to the rural and peri-urban populations of East Africa on the grassroots level. The use of these technologies can improve domestic health conditions, alleviate poverty, stimulate growth and protect the environment. Through the widespread implementation of small scale solutions across the local level, many of the problems associated with large capital and cost intensive project approaches can be avoided and the poor will be presented with an opportunity to raise themselves out of the cycle of poverty.

Approach & Method

smallsolutions will implement coordinated capacity building, public awareness and business development activities in order to inform the target population of the benefits associated with the use of clean energy alternatives and prepare them to make informed decisions regarding their purchase.

smallsolutions plans a multiphase approach:

1. Identify Project Areas and Cooperation Partners

In order to enter the market, 3-5 small scale pilot projects in Kenya and Uganda will be established. **smallsolutions** will identify project areas and locate partners such as women's groups, village councils or community organizations with an established local presence and who enjoy the respect and trust of the local population.

2. Perform Sensitization, Capacity Building, Business Development Activities

After identifying cooperation partners and establishing a project area (geographic area comprising approximately 5,000-10,000 households), **smallsolutions** will begin introducing alternative energy solutions through a series of sensitization, capacity building and business development activities.

Activities will involve group discussions, product demonstrations and distribution of information materials. The goal of these efforts will be to win a handful of “spontaneous” purchasers who are quick to recognize the potential of the technology. These individuals will become “seed” representatives in their communities and through their use and excitement, serve as marketing examples for their family, friends and neighbors.

3. Achieve Sustainable Growth through Local Business Development

Community based “seed” users will become the foundation for the local business development and networked marketing structure to ensure a long term local presence and sustainable growth. We envision 1-2 local representatives per 500 households. These individuals will have the opportunity to receive in-depth training in the use, maintenance and repair of the clean energy products. In addition to becoming the business backbone of the project area, these representatives will also be able to participate directly in the growth of the business by receiving commissions for new customers acquired through their efforts.

We expect the sensitization process in a project area to last from six months to a year.

Products

smallsolutions will initially introduce 1-2 alternative energy products depending on the requirements of our local partners and the project area. Solutions focussing on solar lighting or both solar lighting and cooking will be offered.

smallsolutions has evaluated various solar lighting and cooking products currently available. Evaluation criteria involved wholesale pricing, shipping costs, performance, durability, replacement cost, design, ease of use and added value aspects such as mobil phone and battery charging capabilities.

1. Lighting and Power Products

The clean energy lighting and power products to be offered typically consist of an LED light, a 0,5-2W solar panel and mobil phone and battery charging adapters. The lighting products will initially be marketed as complete systems (light & solar cell) with the added value options available at an extra price. The LED lights generally have two settings and provide 4-6 hours of bright light at the highest quality setting and 8-10 hours at the lower setting. On the high setting, the light quality is about 10-15 times that of traditional wicked kerosene lamps.

The lamps require daily recharging by placing the solar cell in the sun and connecting it to the lamp. The charge time varies from 4-8 hours depending on the availability of sunlight. The lamp batteries reportedly have a lifespan of about 500 cycles or 1.5 years of daily use. Solar cells can be expected to last from 5-10 years if handled with care.

Additional cost savings can be achieved by using the solar panel as a mobil phone and rechargeable battery charger – resulting in even greater monthly energy savings for the customer.

Wholesale costs range from \$7.50-\$9.50 per unit. Replacement batteries and LED's are reported to cost about \$2.00 each. Local distributors are available in Kampala and Nairobi. Further price reductions and special configurations will reportedly be available as the business relationship develops.

2. Solar Cooking Products

The viability of solar cooking has been subject to mixed reactions – from the very positive to the very negative. However, field visits and personal interviews with rural users in Kenya and Uganda seem to justify including the product in an integrated solution. Due to its nature, solar cooking cannot be performed 100% of the time, but people interviewed stated being able to use it about 80-85% of the time at great savings.

Solar cooking requires a solar oven whose configuration can range from a basic cardboard and foil “box” solution to a large diameter highly reflective parabolic unit capable of boiling water in about 20 minutes. **smallsolutions** will initially market the basic cardboard unit with other options available on order. The product is generally available as a kit consisting of folding cardboard oven, black pot, plastic bag and a water pasteurization indicator (WAPI). The use of a “Fireless Cooker” (insulated basket) is also recommended. The thermal properties of the basket allow food to finish cooking or to simply keep food warm. The basket can also be combined with traditional cooking methods as a means to save fuel – it keeps food and water hot for up to 8 hours.

The solar cooking kit costs about 15,000/- USh in Uganda and 1,200/- KSh in Kenya. The equipment is produced locally.

Pricing

1. Rural Income and Cost of Traditional Energy Alternatives

Currently used traditional cooking and lighting methods include kerosene lamps and open cooking stoves which use kerosene oil, fuel wood and animal dung. According to Kawesa Mukasa of the Solar Connect Association in Uganda and interviews conducted in Kampala and the Ssesse Islands, the rural population earning from 1,600-3,200/- USh per day in Uganda generally spends about 1,000/- USh and 500/- USh per day on charcoal and kerosene respectively. This amounts to about 30,000/- USh for charcoal and 15,000/- USh for kerosene per month.

In Kenya, the income percentages and cost breakdowns are similar.

2. Price Targeting

According to an interview with Professor da Silva at Makerere University in Kampala, the price target for an up front purchase of alternative energy products should be around \$15.00 or 25,000/- USh. At higher prices, customers will reportedly not consider a purchase - even if it is a quality product. This price was confirmed by members of the East African Energy Network in Kampala and in field discussions with potential customers.

smallsolutions will initially set prices in this range and generally require full payment at the time of sale. However, in some instances individuals may not be able to afford the relatively high up front costs and other avenues will be pursued to help them purchase the products.

3. Financing Alternatives

As a part of the sensitization process, alternative finance possibilities will be discussed. In the case of the solar lamp package, it could be possible to purchase the lamp individually and make installment payments by paying for daily charging and financing costs. These daily costs would naturally be fixed at the same or a lower price than comparable daily fuel (kerosene) expenditures. At the end of the finance period, the customer would receive the solar cell and become the owner of the product.

Other financing options for both lamps and cookers could involve group purchases either through local women's groups or community organizations. These options will have to be determined on an individual project and cooperation partner basis. Microfinancing will not be pursued during the start-up due to its relatively high overhead costs and the availability of local alternatives.

Project Financing

smallsolutions will utilize a hybrid model to finance the pilot projects. Grants, donations and private capital as well as eventual revenue from the sale of the products will provide the initial financing. **smallsolutions** will contact NGO's, governmental agencies and private organizations to acquire project funds.

In the future, **smallsolutions** plans to achieve sustainability mainly through the sale of clean energy products and services, the proceeds of which will be reinvested in new project locations and expansion.