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# African Rural Energy Enterprise Development: Unleashing small entrepreneurs for Accelerated Market Diffusion of Cook Stoves in Africa

**THE PROBLEM:** Energy supply remains largely inadequate relative to needs in much of Africa, especially in the rural areas where over 70% of the people reside. Per capita energy consumption in sub-Saharan Africa, particularly in rural communities, is the lowest in the world: 0.3 to 0.6 toe/person compared with 7.5 to 9 in North America (a ratio of 1:30). The majority of the population relies on inefficient cook stoves. Although the potential of small and medium-sized enterprises (SMEs) to expand access to improved cook stoves and other sustainable energy solutions has been recognized in recent years, identifying entrepreneurs with the capacity to turn energy

business ideas into successful enterprises remains a challenge. For the most part, prospective entrepreneurs are unfamiliar with modern and more efficient energy technologies that are appropriate to the needs of under-served rural and urban populations. Most of these entrepreneurs need a great deal of assistance to develop a clean energy business capable of reaching rural and peri-urban customers.

**RESPONSE:** The essence of AREED is the provision of business development services and capital to energy entrepreneurs. The coupling of these services has proven to be very effective in enabling

entrepreneurs to start-up innovative energy businesses, improve their management of existing ones, and demonstrate their potential to mainstream banks as sources of follow-on growth investment.

The real-life story of Toyola Energy, an AREED-financed enterprise that fabricates and sells efficient cooking stoves illustrates the main components and processes of AREED. Toyola Energy's entrepreneurs, Messrs. Suraj Wahab and Ernest Kyei, were among a group of 78 who were trained in energy efficient stove manufacture under the Ghana Household Energy Project in 2003. Though their intention was to start-up a small business after the training, they were unable to obtaining finance from any of the local banks.

Upon learning about AREED in February 2006, they applied for and received business advisory services from KITE and E+Co, resulting in a business plan that was approved for total financing of US\$270,000. From its humble beginnings as a simple tree-sheltered operation in a peri-urban community outside Ghana's capital Accra, Toyola Energy has grown dramatically, increasing sales from 3000 to over 35,000 units per annum within 4 years.

By 2010 the company had supplied over 50,000 households in 6 regions of Ghana with improved energy-efficient stoves and expanded their market to neighbouring countries. The stoves sold by Toyola Energy use standard charcoal but are 40% more efficient than the traditional stoves used in the region. This greatly reduces the amount of charcoal necessary to cook.

To date, Toyola Energy's stoves have helped offset an estimated 15,000 tons of carbon dioxide emissions. The company has also directly and indirectly generated over 200 new jobs. Through door-to-door sales and the active engagement of its sales agents in community life, Toyola Energy identified additional demands for solar lanterns. It has accordingly expanded its product offerings to meet this new demand, effectively diversifying its products and income streams. Toyola Energy's overall success has been internationally recognized with the award of Africa's Energy Personality of the Year 2010 to Mr. Suraj Wahab.

## A PRACTICAL BUSINESS MODEL

The practical process of enterprise development that has made possible the emergence of companies like Toyola and over 30 others in five African countries is best explained by example. Interested entrepreneurs are first engaged in a consultative



process that includes an initial assessment of their entrepreneurial capacities. Those who demonstrate the right aptitude and commitment are then provided with hands-on support to evaluate their business idea and to develop a business plan for funding consideration. Once an approved plan has been implemented and the business is in operation, a second loan may be provided as needed on a cost-sharing basis with the owner(s). Throughout these early stages, significant in-kind support is provided by an AREED country partner working closely with the company's management. Total AREED support to a company typically ranges from about \$25,000 to \$120,000, although it can reach \$500,000 or higher in special cases. AREED's role in the new business gradually diminishes as other partners commit funds to finance growth. The overall solution is considered complete when AREED assistance is no longer needed and the enterprise has reached sustainability, or is capable of attracting additional outside investment.

## REASONS FOR SUCCESS

The success of Toyola's cook stove business is attributable primarily to the following combination of factors:

- A highly motivated entrepreneur with a vision and determination to succeed.
- Capacity of the local AREED partner (KITE) working in close collaboration with E+Co to deliver high quality business development services.
- A large potential market.
- Ability of the entrepreneur to communicate with rural people, cultivate and retain the trust of individual households, and develop innovative marketing and sales skills.
- Access to start-up capital.

## UNEP'S ROLE

With initial backing from the UN Foundation (UNF) UNEP launched AREED in early 2000, building on the pioneering work of E+Co during the 1990s, and working closely with African partners (described below) in Senegal, Ghana, Mali, Tanzania and Zambia (See Figure 1) to deploy a pattern of catalytic activities that made the investments and overall demonstration of AREED model work. These catalytic ("foundational") interventions focused on: 1) building capacity of national partners in clean business development; 2) analytical studies to guide policies and regulatory frameworks supportive of clean energy SMEs; and 3) raising donor awareness and additional co-funding for clean energy investments.

## PARTNERS

At the country level, the main AREED partners are:

- The *Energy Program of ENDA*, an international NGO based in Dakar, Senegal, is targeted to a better technical, economic and socio-cultural understanding of the energy problem in African countries through a set of activities including design and implementation of energy information systems, energy planning, energy management, rational use of energy and, energy policy.
- The *Kumasi Institute of Technology and Environment (KITE)* is a Ghanaian NGO committed to the development of technological capabilities for sustainable energy and industrial development, in harmony with the environment.
- The *Centre for Energy, Environment and Engineering (CEEEZ)*, is a Zambian non-governmental organization (NGO), which collaborates with Government and various institutions in the country and overseas in the fields of energy, environment and engineering.
- The *Mali-Folkecenter (MFC)* is a Malian NGO whose mission is to promote use of renewable energy and environmental saving technologies in Mali with special focus on the rural population.
- The *Tanzania Traditional Energy Development and Environment (TaTEDO)* is an NGO comprised of professionals, individuals, artisans, farmers, community-based organizations and Micro Enterprises

involved in the development and promotion of Renewable Energy Systems (RES) for enhancing sustainable environment and socio-economic development of communities in Tanzania.

- The main international partner was **E+Co**, a non-profit company specializing in the creation and growth of developing country energy enterprises. With offices in Costa Rica, Nepal, Vietnam, South Africa and the United States, E+Co is a recognized leader in the enterprise centered model and related financial and fund management matters.

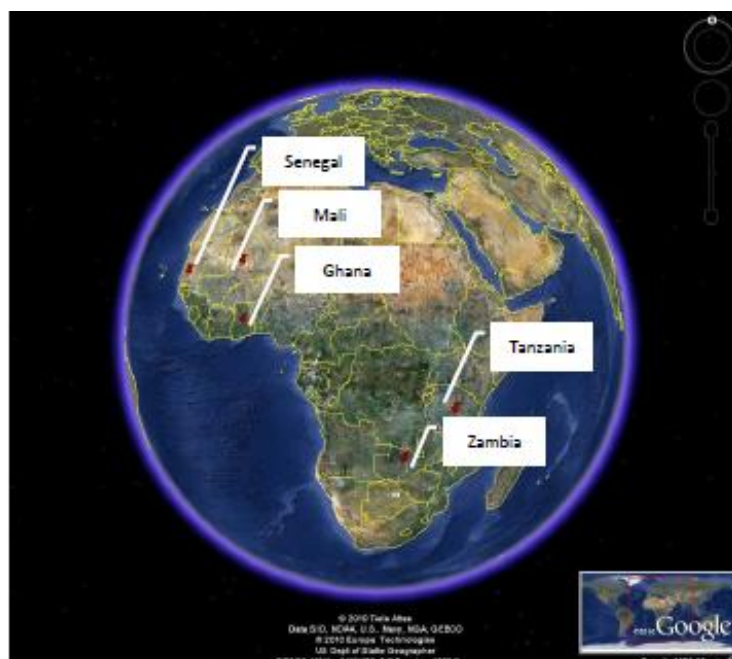


## THE BIG PICTURE:

- Impact on national policy:** Through a continuing process of engagement with national policy makers, AREED partners have made significant contributions in shaping innovative policy instruments and regulations supportive of clean energy SMEs. Examples include advisory support provided by the Mali Folkecenter toward the enactment of an enterprise-friendly law (governing importation of renewable energy equipment). And in Ghana, KITE played a key role in nurturing a forward-looking partnership between LPG retailers and government to correct market failures that were hampering expansion of the LPG market into rural areas. All the AREED partners, supported with additional Swedish government funding, are intensifying efforts to build government awareness of AREED impacts, an essential step towards mainstreaming the approach into national energy, climate mitigation and adaption planning.

b. **Replication:** The replication potential of the AREED model is high, not only because of its inherent flexibility, but also by virtue of the fact that the problem it addresses, as well as the macro-economic context of application, tends to be broadly similar across most sub-Saharan African countries. In particular, the key lessons learned are transferable to other African countries, where they could feed into the design and implementation of solutions tailored to each context. E+Co, the AREED partner which pioneered the model, has in fact drawn on lessons learned from the initial five countries to replicate the approach in new ones.

c. **Scalability:** The AREED business model is scalable on account of the positive net financial and developmental returns it makes possible. The portfolio of AREED investments yields average returns (after write-offs) of 8% to 9%. This is making the model increasingly attractive to environmental and development-oriented venture funds – a basic requirement for scaling up the approach. In addition to the initial US\$4.3 funding from UNF, AREED raised an additional US\$4 million from other donors mostly to support the scale-up of capacity building and policy aspects. Furthermore, one of the AREED partners, E+Co, has succeeded in raising US\$250 million in additional capital (as at August 2010) to scale up investments worldwide.



## LESSONS LEARNED

- Finding the right entrepreneur to support is critical for success. Capacity (skills and logistic resources) of a local country organization to do this is paramount.
- High quality business development services and toolkits must be delivered to selected entrepreneurs before, during and for several months after investment.
- Strong government support is necessary and must focus on: a) creating/expanding markets for cook stoves, and b) identifying and removing barriers to energy enterprise development and growth.
- Multiple donors that may be active in a country should carefully coordinate amongst themselves at all stages in the project/program design cycle to avoid conflicts, enhance complementarities/build synergies.
- An effective and efficient mechanism for monitoring and evaluating enterprise performance needs to be put in place, continuously and periodically feeding back lessons learned into progressive improvements in tools and services rendered to entrepreneurs.
- To facilitate replication and scale up of the model, it is essential for the project team to systematically disseminate credible enterprise performance data and development impacts to governments, financial institutions, donors and the general public in the country.