



REED programmes use a market based approach to help rural families move up the "energy ladder".

A focus on household energy

For most low-income households in developing countries, the choice of energy for cooking, lighting and heating is often *no* choice - they use whatever fuel is available and affordable. This is typically some form of biomass such as wood, dung or crop wastes - fuels that negatively impact social, economic and environmental health.

Helping populations climb the "energy ladder" from poor quality biomass sources to higher quality energy products and services, has been a driving force of development activities in the energy sector. However recent studies have found that even when newer forms of energy are made available households seldom switch over immediately but rather continue to use a mix of energy sources, based on both economics and cultural practice. Promoting the delivery of improved energy options in such an environment requires products well tailored to the needs and preferences of local populations. Small scale local enterprises are well positioned to understand and meet this demand.

Rather than prescribe a technology or energy option - a specific step in the ladder - REED programmes support a broad *range* of clean (or

cleaner) energy enterprises that deliver various products and services. Together, this portfolio of energy choices can help low-income households diversify their energy mix, improve the quality of their energy use and reduce their reliance on polluting sources.

In Africa, AREED investments in charcoal, cook stove, LPG and biofuel enterprises have all targeted household energy needs and their associated environmental costs. In China's Yunnan Province, the CREED programme is focused on financing fuel substitution enterprises, specifically those that help to preserve the region's rich biodiversity.

By supporting a broad range of energy enterprises marketing a variety of energy services, REED programmes apply a market based approach to helping rural and peri-urban households (and enterprises) climb the energy ladder.

REED support is generously provided by the United Nations Foundation, UN Fund for International Partnerships, Blue Moon Fund and The Nature Conservancy.

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As the longest running REED programme, AREED has now invested in 15 clean energy enterprises with an additional 12 investment opportunities receiving business development assistance from AREED partners. The investments include enterprises involved in a wide range of products and services, including:

- solar crop drying
- efficient charcoal production
- manufacturing efficient cook stoves
- wind powered water pumps
- solar water heating
- liquefied petroleum gas (LPG) distribution
- biofueled multifunctional platforms, and
- energy efficient motors and lighting.

First Investment for Tanzania

Two new enterprises have recently been awarded AREED financing, including the first investment for Tanzania - a four-year, US\$50,000 working capital loan for **Biomass Energy Tanzania Ltd. (BETL)**. The loan will facilitate a biomass fuel substitution service in the production of cement by the Tanga Cement Company Limited (TCCL).

The AREED working capital loan enables BETL to coordinate the delivery of 1000 tons of biomass to TCCL each month and to establish itself as a key provider of biomass waste to Tanzanian industries.

Charcoal entrepreneur Fred Musondo (far right), discusses his AREED loan with Estomih Sawe (2nd from right) from TaTEDO, and Lawrence Agbemabiese (centre) from UNEP.



Underlying BETL's business is a Tanzanian law requiring industries producing biomass waste to have it removed at their own expense. The proposed venture has the advantage of easing the financial burden on local industry and provides an opportunity to transform waste into a valued fuel source.

E+Co Africa's Jurie Willemse says the environmental benefits of establishing this enterprise as a dedicated biomass fuel supplier within the Tanzanian industrial sector is a big win for AREED. "Currently companies such as TCCL use heavy industrial fossil fuels for their kilns. Successfully replacing this fuel with unused renewable biomass leads to cost savings and numerous environmental benefits, including the potential to decrease greenhouse gas emissions."

Mali LPG Market Expands with Sodigaz

In the Malian capital of Bamako, entrepreneur Oudiary Diawara is using AREED financial and business development support to expand the market for LPG. Mr Diawara started his company **Sodigaz** to capitalize on the steady growth of LPG demand, which is increasing at an average annual growth rate of 15%.

In a short period of time, Sodigaz has developed a network of 32 distributors and captured ten percent of the LPG market in Mali. Although woodfuels present some comparative advantages to LPG (e.g., good availability, retail

price, and purchase flexibility), it is less efficient (measured in terms of useful energy), causes significant health impacts and puts increasing strain on Mali's dwindling forests.

However, the company's growth is constrained by an unreliable LPG supply – which must come by road from Ivory Coast, Ghana or Benin - and a corresponding lack of bulk storage capacity. A \$175,000 AREED loan will allow Mr Diawara to add additional storage capacity and increase the company's stock of cylinders and LPG. The increased storage capacity will provide Sodigaz with a greater capability to import LPG, increase sales and reduce the price to distributors. AREED financing will also allow Sodigaz to develop a new revenue stream through the sale of cylinders and to expand its

Kofi Nketsia-Tabiri is leaving his post as KITE's AREED project officer to become investment officer at E+Co Africa. His new responsibilities will include AREED investment in Ghana plus other duties.

KITE Workshop advances LPG Policy

In some situations REED investments also provide the opportunity and insight to contribute to improved policy environments for improved energy service delivery. AREED's experience financing LPG enterprises in Ghana and Mali (see 'SODIGAZ') has brought to light some of the problems facing new enterprises in the sector, including uncertain policy environments, limited support for rural expansion, and high prices for LPG appliances.

AREED's local partner in Ghana, the Kumasi Institute for Technology and Environment (KITE) has been working to improve LPG policy in the country. Building on the experience of financing Annesset, an LPG distributor in Accra, KITE released a policy and market report in June 2002 titled "Investment Opportunities in the Liquefied Petroleum Gas Sector in Ghana" by Kofi Nketsia-Tabiri. KITE then organised an LPG workshop in April 2003 with representatives from technical, governmental and business organisations to discuss national LPG policy in Ghana.

KITE director, Abeeku Brew-Hammond, explains that the aim is to help create an improved operating environment for enterprises supplying LPG products and services. "What is really interesting is that we have many more LPG ventures in our pipeline with operations located in more rural areas," he says. A combined enterprise development/policy push is needed to drive this rural expansion.

Support is building. In August UNDP and the World LP Gas Association launched the LPG challenge in Ghana, information on which is available at www.undp.org/seed/eap/

New energy fund

A Rand 50 million (\$ 6 million) fund has been launched in South Africa by E+Co Africa's spin-off, RAPS Finance. With backing from the Amalgamated Bank of South Africa (ABSA) and the Industrial Development Corporation, as well as the European Union and the Shell Foundation, the "Empowerment through Energy" fund will invest in growth enterprises in South Africa and other African countries, including possible follow-on investment for AREED enterprises in Ghana, Tanzania, and Zambia.

facilities. Sodigaz will also use a mobile filling station - the first in the country - to deliver LPG in towns and villages currently without LPG access.

From an AREED point of view, the investment in Sodigaz supports government initiatives as well as playing a major role in building a strong LPG industry in Mali. AREED will eventually consider further investments in the LPG sector in enterprises that continue this expansion into rural areas.

Zambia Goes “Nuts” for Local Fuel

The supply of liquid fuels in the Zambezi region of northwestern Zambia is often erratic and expensive, but the oily Jatropha nut can provide a viable and locally produced alternative fuel for use in lamps and diesel engines. The thorny Jatropha plant is found in abundance in the region and used as hedging and a natural division between properties. The nuts from the plant, however, are mostly wasted.

Enter entrepreneur Henry Ngimbu, who saw the potential to displace imported fuels with locally produced Jatropha oil. In 2001, he started **Rural Challenge International (RCI)** and began producing Jatropha oil and its by-product of “pressed cake” fertilizer using a manual oil



Jatropha plant with seed

expeller and cloth for filtration. While this enabled testing and research of the product, production capacity was limited.

With AREED support, including a \$12,000 loan for equipment and working capital, RCI is expanding the company’s current micro scale Jatropha oil production activities into a larger commercial venture. From an AREED perspective, the investment in local manufacturing has the potential to provide not only a cheaper and more reliable fuel supply, but also to create jobs and expand local economical activity.



Village Ambiental First PV Investment

Irrigating just one hectare can make a huge difference to the income of rural families in Brazil. To help such families purchase irrigation pumps powered by solar photovoltaic (PV) systems, B-REED and the Solar Development Group are co-financing a US\$110,000 loan to the enterprise **Village Ambiental (VA)**.

REED’s loan and continued enterprise development services will help VA develop a pilot consumer financing project, strengthen its market position and ultimately scale up to serve an estimated market of more than 10,000 non-electrified rural homes.

This investment exemplifies a fundamental productive use of PV energy: water pumping for irrigation. By facilitating four corn harvests per year, three of which would occur during the off-season when prices are substantially higher, rural families can increase their average monthly disposable income by 5-10 times, which can be used to rapidly pay back system costs and provide a subsequent permanent income.

“The investment represents an environmentally sustainable and economically viable use of renewable energy for increasing income, which



PV powered irrigation systems can make a substantial improvement in rural incomes.

can then lead to rural electrification and help families escape poverty,” says E+Co’s B-REED Program Manager, Gina Rodolico.

There is also potential to replicate the investment with other farmers and create sufficient scale to negotiate higher prices for rural products. With training to rotate crops and use organic fertilizers, the project will also advance the practice of sustainable land management.

USAID provides \$ 550 000 to E+Co and local B-REED partners for renewable energy enterprise development.

B-REED Pipeline Advancing

The B-REED pipeline is advancing with a number of initiatives that demonstrate the wide diversity of enterprises in the REED umbrella.

Revolving Finance

A revolving fund has been proposed to finance the maintenance needs of photovoltaic solar home systems (SHS) installed through the Luz do Sol rural electrification program in Alagoas. The fund would finance the replacement of batteries and other equipment.

Making Bricks

The largest brick manufacturer in Alagoas has recently been forced by rising costs to switch from eucalyptus wood to more polluting coke. The company has applied for B-REED support to purchase chopping and drying machines to create more efficient biomass combustion and the flexibility to burn pre-dried sugar cane waste (bagasse). Support will also be used by the company to plant a 99 ha eucalyptus forest that will eventually provide all the present fuel needs for brick firing and create 42 permanent jobs in the planting, management and harvesting of the forest.

Solar Dried Bee Pollen

Collecting and processing bee pollen may sound like an unusual enterprise, but the product is very much in demand by natural product stores, pharmacies, supermarkets, nutritionist and gym academies. A start-up company planning to stimulate the production of bee pollen and tap into this lucrative market is seeking B-REED support to solar dry bee pollen in specially built solar dryers, which are reliable and economically attractive. Further, encouraging increased pollination for the production of bee pollen can also increase coconut and fruit production and enhanced forest preservation.

B-REED assistance includes developing the business plan, designing the financing structure, and identifying the most appropriate solar dryer. There is a large potential to scale-up the enterprise and therefore the investment will generate jobs in a rural area, which can slow urban migration.

CREED

www.uneptie.org/energy/CREED

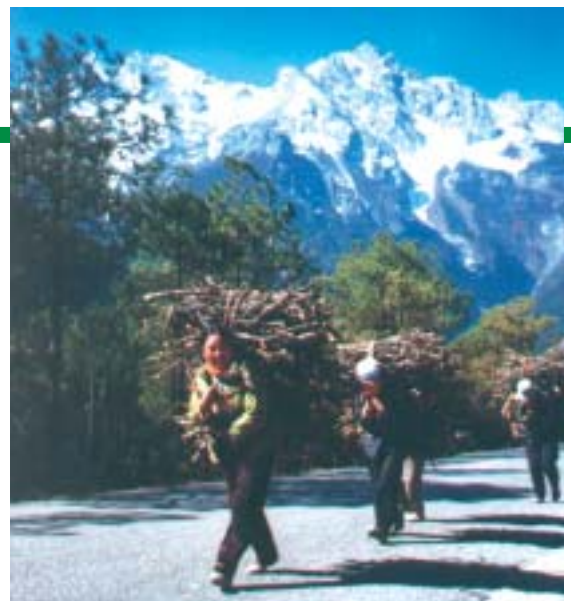


With backing from the United Nations Foundation and the Blue Moon Fund, the China REED Initiative will soon be operational and focused on areas in the northwestern part of China's Yunnan province, a region globally recognised for its rich biodiversity.

CREED's aim is to help create a sustainable energy development path for the rural poor by financing cleaner energy services that improve rural health and alleviate poverty. The project also builds on a larger, multi-year effort by The Nature Conservancy (TNC) to preserve Yunnan's biodiversity.

At a meeting in early June, partners planned the new entity 'CREED Services Inc', a joint venture that will provide the local enterprise development services. TNC's China Programme Senior Advisor, Ed Norton, said partners recognized that anchoring the REED approach in Yunnan will require pooling expertise, commitment and patience.

"All the partners see CREED as the beginning of a long term effort rather than merely a three year project. However, with trained staff and systems, we fully believe this entity can progressively assume greater responsibility for enterprise development and investment throughout and beyond the project. The first goal is to develop a track record of visible investments from the professionally managed and Chinese-staffed CREED Services Inc."



The unsustainable collection of wood for fuel impacts the rich biodiversity of China's Yunnan Province.

To make rural energy services commercially viable in this market, CREED will also offer consumer credit, micro enterprise and income generation support. CREED can thus help to influence broader shifts in energy and development underway in China and redirect existing sources of finance and support to achieve sustainable energy goals.

In August Citigroup Foundation commits USD 50,000 in matching Enterprise Finance for CREED

The
REED
report

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