Technical Report
USDOE Contract #DE-FG03-OOSF22394
"Increased use of Renewable Energy in Africa through a
Program of Energy Enterprise Development and Investment"
For the period September 15, 2001 to March 14, 2004

Submitted by E+Co
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Purpose of Contract:

To allow E+Co, in partnership with AstroPower Inc, Bergey WindPower, and Community Power Corporation, to provide training in enterprise development and technical applications, local partner capacity building, individualized enterprise development services and seed capital investment to catalyze the creation of sustainable renewable energy enterprises that deliver clean energy services to households and businesses in South Africa, Ethiopia and Tanzania. The specific areas of focus were:

- Linkage with government or bi-lateral programs in each country.
- Training sessions for energy entrepreneurs.
- Distribution of Entrepreneur Business Development Toolkits and Technical Training materials.
- Provision of Enterprise Development Services leading to Business Proposals submitted to E+Co for review.
- Business Plans or Pilot Projects ready for seed capital, with investment flowing to a number of these enterprises.
- Increased equipment sales to the three countries by the US RE companies

Results:

South Africa:

- In June 2003, The Africa Enterprise Through Energy Fund (ETEF), a Rand 50 million (~US\$7.5 million) fund was closed. The purpose of ETEF is to establish and strengthen small and medium clean energy enterprises, to ensure the delivery of modern and affordable energy services on a sustainable basis. The Fund investors are the Amalgamated Bank of South Africa, the Industrial Development Corporation of South Africa and the Shell Foundation. The E+Co model of energy enterprise development influenced the design of ETEF, which has an exclusive black economic empowerment focus in South Africa. This fund is a “first” in that it brings completely new resources to the sector and is a local currency fund, an innovative and exciting aspect of the fund structure. By March 2005, funds have been committed to 10 investments with an average deal size of R1.54 million (\$250,000).
- E+Co Africa staff worked with the Department of Minerals and Energy (DME) and the Department of Environment and Technology (DEAT) on renewable energy development. Staff has also actively participated in WSSD Type 2 initiatives, specifically in a GVEP Finance workshop and regional meetings of the UK-sponsored REEEP initiative.
- 1 Training session was held on the 15 of May 2003, and 21 entrepreneurs were trained.
- 30 Entrepreneur Business Development Toolkits and Technical Training materials have been distributed.
- 15 Project Proposals for clean energy enterprises have been submitted to E+Co for review. Enterprise development services were provided to these entrepreneurs, producing three Business Plans or Pilot Projects ready for seed capital. These business plans are for two solar water-heating companies and a wind company. Summaries of these businesses are included in Attachment 2.
- While there was early collaboration with AstroPower SA for sales expansion in the South African market, with AstroPower participating in the early E+Co sponsored training programs, this did not yield specific results, mostly through the re-trenching and subsequent sale of the AstroPower business.

Ethiopia:

Work began slowly in Ethiopia, mostly as the result of the process of securing funding from a US foundation that would be targeted for investment in Ethiopia clean energy enterprises. This was achieved in September 2002, when E+Co received a \$250,000 grant from the Packard Foundation earmarked for the development of clean energy enterprises in Ethiopia, with \$200,000 specifically for investment. The DOE funds supported the development of enterprises which would then be eligible to access the investment capital provided by the Packard Foundation.

Specific accomplishments under the DOE-funded work include:

- Introduction of the E+Co model to the Rural Electrification Fund being established by the Ethiopian Electricity Authority and the World Bank. The Ethiopian Electricity Authority requested E+Co's input on the design of this fund.
- Identification of and delivery of enterprise development services to 10 entrepreneurs, which resulted in 6 business proposals submitted to E+Co for review.
- Investment by E+Co in a solar water heating manufacturing business.

Tanzania

During the contract period, E+Co was also implementing a UN Foundation funded program in Tanzania, the Africa Rural Energy Enterprise Development Program (AREED), which closely coordinated the activities of the DOE funded work with AREED. Specifically,

- 2 training sessions were held in 2002 (May and July) and 32 entrepreneurs were trained.
- The Toolkit and Training materials were distributed to the 32 entrepreneurs.
- As a result of the training, enterprise development services were provided to 10 companies, producing 3-business plans ready for investment. These businesses are summarized in Attachment 2.
- A US\$50,000 investment was approved in March 2003, and this company is operating according to its business plan.
- AstroPower participated in the training programs, providing the entrepreneurs with insights into the energy needs of Africa and more specifically Tanzania.

Technology Company Partnerships

AstroPower was quite active with E+Co in this work. E+Co communicated with both Bergey Windpower and the Community Power Corporation regarding the activities in the three countries and their interest in participating. Bergey informed us that at that time they were not interested in the African market. Bergey did provide E+Co with materials on the Bergey products, including training documents. In conversations with Community Power Corporation, interest was expressed in the market, however the principals were not able to commit CPC staff to direct involvement in the work – the contract had only included travel funds, and not funding for technology company staff.

Attachment 1 Business Plan Summaries

South Africa:

NewEnergies (Suntank)

NewEnergies aims to lease to industrial customers a retrofitted SWH that will supply the daily hot water needs at a price that is cheaper than its current electric hot water generating costs. Experience gained on the larger systems Suntank has installed for cash shows that considerable savings can be gained from retrofitting a SWH from a more traditional electric or fossil fuel boiler. Through a lease arrangement, NewEnergies makes available a suitably sized system after carefully auditing the consumer's hot water needs and costs. The lease cost to the customer is lower than the cost of grid electricity or fossil fuel taking into account all costs and a profit for NewEnergies.

E+Co assisted NewEnergies with its business plan development. In November 2003, a \$250,000 was approved and the first disbursement was made in February 2004. As of March 2005, the company had installed 6 operating systems in senior citizen housing and other residential communities in South Africa.

African Windpower

African Windpower manufactures wind generators for the South African and overseas markets. Originally from Zimbabwe, the company was forced to relocate and start operations in SA. The company needs \$200,000 of investment capital to restart operations and invest in better plant and machinery to fill the growth in demand for its products. E+Co provided services to this company, but an investment grade business plan was not completed.

Solar Beam

Solar Beam is an established SWH business, which specializes in the design, manufacture and sales of solar water heating equipment. The company has been in existence since 1978 and has a 26 year track record. It undertook two major bush camp developments. The first, iPhiva Bush Lodge, has proven very successful, being totally solar powered, with floating chalets. The second, Sibaya Lake Lodge, proved to be a disaster, the net result being that Solar Beam was compromised. Instead of liquidating, the company consolidated and made a new start. A loan of \$140,000 will be recommended in 2003.

Ethiopia:

GAST

GAST manufactures and installs Solar Water Heaters primarily within Addis Ababa. The entrepreneurs presently are selling approximately 6-7 heaters per month. The heaters are technologically very basic and the business does not have the machinery to increase production or quality. The business was started one and a half years ago when the entrepreneur completed his university research project on solar water heaters. While still working for an engineering firm he landed a contract to build and install a solar water heater. The buyer provided him an interest free loan to increase his production and the business was borne. GAST believes that it can sell up to 200 units per year mostly to households (80%). The balance could be sold to hospitals and hotels. The problem is apparently not the demand – but rather the ability to supply the product timeously of a good quality.

E+Co provided a \$62,000 loan in July 2004. The company is performing well and meeting its business plan projections.

Tanzania:

RESCO

RESCO (T) LIMITED will procure and sell solar electric systems in rural areas of Tanzania. Systems will be sold on a cash basis to individual households and on credit to the individuals with a regular income (salaried employees). Credit will be provided to only those employees who have made arrangements with their employers to deduct the monthly amount from their salaries. A draft business plan was prepared. E+Co provided enterprise development services to the entrepreneur and a new business plan was submitted in December 2004. The entrepreneur became engaged in a UNIDO program, which has resulted in a decrease of his attention to this business expansion.

FADECO/Rift Valley

The entrepreneur has been involved in the drying of fruits for some time. However initially farmers were given dryers to process their own surplus fruits with Rift Valley undertaking marketing and distribution. Variances in supply and quality led Rift Valley to believe that the drying and processing should be done centrally along with marketing and distribution. A proposal was received that involved setting up a fully functional processing and drying operation as well as the building of commercial dryers. Existing packaging, marketing and distribution systems will be used initially. A business plan was completed. As of March 2005, the company is still active and in discussions with E+Co, although no investment has been made.

BETL

BETL will supply, transport and deliver biomass to clients. BETL secured a contract with a large cement manufacturer currently using heavy fuel oil. BETL required start up assistance in the form of a working capital loan to service the demands of the cement factory contract and establish itself as a key provider of biomass waste to industries in fuel switching applications. E+Co approved a \$50,000 investment in March 2003, and the company is performing satisfactorily.