NRECA International Ltd.

Your Touchstone Energy® Partner

Cooperative Development Program

Semi-Annual Progress Report

July 1, 2003 – December 31, 2003

Cooperative Agreement
No. FAO-A-00-97-000012-00

Submitted by:
NRECA International, Ltd.
4301 Wilson Boulevard
Arlington, VA 22203

to

The Office of Private and Voluntary Cooperation
Bureau for Democracy, Conflict and Humanitarian Assistance
U.S. Agency for International Development
1300 Pennsylvania Avenue, N.W. (Room 7.6D)
Washington, D.C. 20523

Cooperative Development Program

Semi-Annual Progress Report

July 1, 2003 – December 31, 2003

Cooperative Agreement
No. FAO-A-00-97-000012-00

Submitted by:

NRECA International, Ltd.
4301 Wilson Blvd.
Arlington, Va. 22203

to:

The Office of Private and Voluntary Cooperation
Bureau for Democracy, Conflict and Humanitarian Assistance
U.S. Agency for International Development
1300 Pennsylvania Ave. N.W. 7.6 D
Washington, D.C. 20523

Table of Contents

1. Executive Summary.....4

2. Global Overview.....6

3. CDP Focus Countries

   Guatemala/Central America 8
   India.....8
   Dominican Republic.....8
   Bolivia.....9
   CFC Sub-grant/Philippines.....9

4. Attachments

   A. NRECA – IFC/PSAPT Alliance Concept
   B. NRECA-IDB/MIF Alliance Concept
   C. NRECA International Foundation Growth Chart
   D. Tanzania "ACCESS H2O" Project Paper
   E. ECOWAS Resolution on Rural Electrification
   F. Southern Sudan Electric Cooperative Project Concept

List of Acronyms

ADB/PSOD - Asian Development Bank/Private Sector Operations
CAS – Corporate Advisory Services (IFC)
CFC - National Rural Utilities Cooperative Finance Corporation
CDP - Cooperative Development Program
CDO - Cooperative Development Organization
DBP - Development Bank of the Philippines
ECs – Electric Cooperatives (Philippines)
ERC - Energy Regulatory Commission (Philippines)
FEB - Fundacion Energetica Boliviano (Bolivia)
GDA - Global Development Alliance (USAID)
IDB - Inter-American Development Bank
IFC - International Finance Corporation (World Bank Group)
MDBs - Multilateral Development Banks
MIF – Multilateral Investment Fund (Inter-American Development Bank)
NEA - National Electrification Administration (NEA)
NRECA - National Rural Electric Cooperative Association
OCDC - Overseas Cooperative Development Council
PSAPT - Private Sector Advisory Policy Transactions (World Bank Group)
REFC - Rural Electrification Financing Corporation (Philippines)
USDA - U.S. Department of Agriculture
WBREDC – West Bengal Rural Electrification Development Corporation (India)

EXECUTIVE SUMMARY

The purpose of NRECA's Cooperative Development Program is to promote electric cooperatives as the system of choice in the broader context of global electrification. Our basic CDP strategy is to develop institutional alliances internationally and in-country for improving and supporting the electric co-op model. Focus countries are Bolivia, Dominican Republic, Guatemala, India and Philippines, which is focused on our continuing support to REFC under our sub-grant with CFC.

Global

Key objective and strategy: Build working alliances with public and private agencies to promote, implement, and strengthen cooperative and consumer-based rural power programs.

Counterparts: World Bank/IFC, IDB/MIF, ADB/PSOD, USAID and other bilateral donors, private corporate foundations and funds, NGOs and potentially others.

Current status/primary activities: An understanding was reached with the World Bank/IFC's Private Sector Advisory Service/Policy Transactions group to begin working formally as a partnership. Several initial activities were under discussion at the end of the reporting period, including work in Philippines, Vietnam, and Nigeria. Preliminary concepts for setting up electric cooperative development agencies in partnership with private-sector units of the Inter-American Development Bank and the African Development Bank were also developed. NRECA also participated in the OCDC-coordinated case study review aimed at establishing a common evaluation model for USAID-support CDOs.

Guatemala (Central America)

Key objective and strategy: Fill the rural electrification gap left by INDE's privatization by developing/ expanding an independent rural electrification financing system based on a revolving fund model similar to the financing system supporting rural electric co-ops in the U.S.

Counterparts: Municipalities, cooperatives and private investors, Ministry of Energy and INDE/Union Fenosa trust fund.

Current status/primary activities: NRECA continued to explore ways of assisting the GOG to improve and expand the on-going rural electrification trust fund particularly to include a role for municipalities and local community groups.

Dominican Republic

Key objective and strategy: Develop a sustainable, national-scale electric cooperative development model working directly with local communities and in collaboration with the GODR and multilateral lenders.

Counterparts: Superintendent of Energy (GODR) and local communities.

Current status/primary activities: We continued work on setting up a national electrification management framework with the government that will lead to supporting electric cooperatives, and laid plans for establishing one or two pilot projects to be funded with a USDA monetization program. A new GDA grant was approved to support this process.

India

Key objective and strategy: Strengthen the role of electric cooperatives in States' electricity reform programs, as part of the Union Government's rural electrification expansion program, and develop a new "cooperativization" model that can be replicated.

Counterparts: Ministry of Power, REC, WBREDC and others.

Current status/primary activities: We focused our effort on developing a consortium arrangement with several Indian partners to implement a model project (in West Bengal).

Bolivia

Key objective and strategy: Develop and implement a strategy for sustainable support for electric co-ops.

Counterparts: Vice-Ministry of Electricity and several Bolivian electric co-ops.

Current status/primary activities: A major monetization project submitted by NRECA in 2002 was approved by USDA and we began work to mobilize this project.

CFC Sub-grant/Philippines

Key objective and strategy: Establish an independent financial agency for electric co-ops as an initial step toward strengthening the internal institutional capacity of the co-op community to modernize and improve itself.

Counterparts: Rural Electrification Financing Corporation, Development Bank of Philippines and multilateral investment agencies (IFC and ADB).

Current status/primary activities: The REFC initiative achieved a critical mass with the completion of a formal business plan as the basis for negotiations with banks and investors, however obstacles remain.

GLOBAL OVERVIEW

NRECA's cooperative development program (CDP) strategy is oriented toward promoting the rural electric cooperative model in response to electric utility sector reform in the developing countries. These policy changes have created new opportunities to introduce the concept of electric cooperatives in countries where privatization of para-statal electric utility agencies has not explicitly provided for rural electrification, traditionally a government agency function. Similarly, this new policy direction in the electricity utility sector overseas, incorporating principles of market competition and de-regulation, has made it necessary to develop stronger support systems for existing rural electric cooperative programs in countries where NRECA has already established the cooperative model. NRECA's CDP strategy is focused on developing new mechanisms and new funding sources for developing and supporting rural electric cooperatives in reform-trending countries where NRECA sees an opportunity to promote and/or expand the electric cooperative model, both in NRECA's CDP focus countries and in other countries and regions where new opportunities arise.

This strategy is being led by the following principles:

- NRECA is developing new alliances to allow rural electric cooperatives and the rural electric cooperative model to find a larger role as part of the overall privatization of electric power industries.

- As part of this approach NRECA will develop new, independent funding mechanisms and sources that in turn can attract funds from traditional development agencies that "buy-in" to NRECA's strategic approach.

- In carrying out project activities, NRECA is expanding the use of NRECA member electric cooperatives and their resources overseas, including personnel and surplus equipment.

- As an operational approach consistent with these principles, NRECA will seek more direct involvement in rural electric cooperative development and support.

NRECA carried out the following activities during the reporting period:

Cooperative model promotion/alliance building: An agreement was reached with PSAPT (now Corporate Advisory Services under restructuring that changed PSAPT from a joint IFC-World Bank unit to an IFC subsidiary). The agreement would be formalized in country-specific activities to be jointly determined, expected to commence during the first half of 2004. In time, we intend this relationship to evolve into a more formal teaming arrangement to provide rural cooperative electrification industry development and support services worldwide (see concept paper, Attachment A).

A discussion was initiated with the IDB's Multilateral Investment Fund to establish a new agency in Latin America targeting the development and support of national-scale electric cooperative industries. MIF was established in the early 1990s to support the transition of countries from economies dominated by public-sector enterprises to greater private sector management and investment in key sectors including energy. The NRECA-MIF process is at an early stage. A concept paper has been drafted (Attachment B) and initial discussions with regional energy sector managers in the IDB have been positive. The program is envisioned to encompass not just MIF's mission and funding but also the public-sector lending operations of the IDB as well as its other private-sector financing programs.

NRECA membership voluntary assistance program: NRECA continued to grow the participation of its membership in overseas cooperative development, as evidenced by the continued growth of contributed counterpart resources through the NRECA International Foundation (see Attachment C). An example was a project to set up a potable water and irrigation system for a remote coffee cooperative in Tanzania, in partnership with an NRECA member system based in New York (see Attachment D), including a $9,500 grant from our Foundation that was part of a $50,000 donation by CFC.

New opportunities - Africa remained a focus area for the development of future electric cooperative programs. NRECA formally joined the Partnership to End Hunger and Poverty in Africa and continued to explore opportunities to set up a program in Africa, where we have had relatively little program activity since our program inception. We developed a concept for a regional rural electric cooperative development agency in West Africa under the auspices of the Economic Community of West African States (ECOWAS). As a result, a resolution was adopted by an ECOWAS power sector steering committee at a conference in November that authorized an NRECA-ECOWAS initiative to formulate such a strategy and obtain the necessary funding support (Attachment E). We developed new opportunities in several other African countries, including Senegal, Sierra Leone, Angola and Nigeria, the latter as part of our new relationship with IFC/CAS. In Sudan, we presented a concept paper to USAID for a start-up electrification project in Yei, near the Ugandan border, and participated on a USAID-OCDC fact-finding mission to southern Sudan (see Attachment F for documentation).

CDP FOCUS COUNTRY UPDATES

Guatemala/Central America

NRECA's CDP priority is to build up the private rural electrification fund that was established in Guatemala, both in the country and in the Central American region as a whole. We continued to develop proposals, with some success. As part of our de-emphasis we transferred our team leader to Dominican Republic to assist in that program while we continue development of our alliances with the multilateral agencies, which should provide good opportunities for establishing long-term funding base for our strategy in the region.

India

Our focus in India remained development of the electric cooperative model as preferred option for addressing Indian reform objectives in the electric distribution sector. The primary activity during the reporting period continued to be our work with the WBREDC and in setting up an alliance with a private financing company and an independent power utility based in West Bengal.

We also attempted, again, to obtain support from USDA for a monetization project that would contribute to a rural electric cooperative program in India, in partnership with NDDB and others. However, USDA declined to support our proposal pending settlement of US-India negotiations on broader food aid disputes.

Dominican Republic

Our CDP's primary objective in DR is to develop a workable strategy for incorporating electric cooperatives as part of NRECA's on-going program in rehabilitating and improving rural electricity service.

We worked collaboratively with the GODR on a new rural electrification management and investment financing framework that would support the development of electric cooperatives nation-wide. This initiative has taken on greater significance in the wake of the unexpected collapse of the concession contract with a Spanish investor-owned utility company (Union Fenosa) that provided for the distribution of electricity in roughly two-thirds of the country. We expect that opportunities for cooperative development to fill in the void where electricity service is poor or non-existent will be very strong.

We also continued to lay plans for the pilot project program to be funded with the monetization proceeds of our USDA project. We had expected to select a project in collaboration with AES Dominicana however we are considering alternative, smaller project sites where we can use the funds to demonstrate an electric cooperative model in

the areas formerly service by the Union Fenosa. We are experiencing erosion in the purchasing power of our local currencies under that project in the wake of DR's growing financial crisis. Following the upcoming national elections in 2004 we expect that both the IDB and the World Bank will pursue rural electrification project loans to the GODR.

Bolivia

Our CDP focus activity in Bolivia is the development of an independently-funded program of electric cooperative development. We completed a $4.6 million contract with USDA for a new monetization project that NRECA will use in support of this objective. During the reporting period we began mobilization steps for this program, supported by the CDP.

CFC Sub-grant/Philippines

Our CDP focus in Philippines continues to the Rural Electrification Financing Corporation, which NRECA is assisting in partnership with the CFC. During this reporting the following was accomplished to move REFC into position to get underway:

- A mortgage-sharing agreement was reach with NEA which could allow REFC to obtain high-quality security against its loans to ECs.
- A business plan was completed as the basis for commencing negotiations with REFC's prospective banking investors (IFC, et. al.).
- The top two REFC management positions – CEO and CFO – were filled.
- Approval by ERC of EC investments in RERC capital subscription agreements was obtained.
- NRECA made an initial equity investment in REFC of approximately $200,000.

There are a number of major challenges still ahead for REFC, including successfully obtaining additional investments and loan funds. NRECA plans to invest up to $1.3 million or so in REFC, but will await the outcome of the current negotiations. We also need to assure an adequate project pipeline, in order to achieve scale economies. DBP continues to lend directly to ECs and being a government-owned bank with low-cost capital this poses as competitive challenge for REFC. Our strategy is to develop a collaborative arrangement with DBP such as entering into co-lending arrangements.

CFC continued periodic visits to Philippines during the period to provide assistance in a wide variety of REFC development tasks. We also sponsored a visit by a delegation of the NRECA Board to visit Philippines in August for the annual meeting of PHILRECA, the national association of ECs.

ATTACHMENT A

IFC(PSAS)/NRECA Initiative in Consumer-Based Rural Electric Utility Development[1]

Business Niche/Purpose

This concept is for a specialized business development team and fund that is to foster national and sub-national programs and enterprises aimed at "normalizing" and expanding electricity and energy distribution/commercialization practices in non-urban markets of selected developing countries, focusing on demand and consumer-driven approaches as epitomized by electric cooperative and other consumer-owned utility formats. Conventional privatization strategies have not been successful in addressing hard-to-serve markets such as rural areas of national and regional concessions. The underlying economic incentive basis for investors is already weak, but also the skill set needed to overcome frequently-encountered deficiencies in utility concessions attempting to serve such areas—low customer density, low energy use and uneconomic capacity utilization, low billing and collection rates, un-funded consumer subsidy mandates, etc.-- is generally not found among the current group of strategic power sector investors.

Cooperatives and other user-based electrification models have exhibited opposite patterns -- higher penetration rates in service localities, emphasis on promoting economic energy use, better discipline in billing and collections -- however cooperatives have not been favored due to an irregular track record. The basic presumption of the proposed PSAS/NRECA business initiative is that cooperatives and similar consumer-led service enterprises can be organized to become integral components of overall reform and privatization schemes under a variety of private-sector implementation mechanisms. Policy reforms and financing strategies currently being adopted by the Bank and client countries for rural electrification development are conducive. Lacking are specific ground-level regulatory/institutional/ business mechanisms *and implementation models/ agents with a strong track record of success* to help implement such policy initiatives. Both PSAS and NRECA are transaction-oriented organizations with strong international reputations, having complementary skills and a shared purpose of building successful markets and industries in electricity supply and distribution.

NRECA's Rationale/Mandate

NRECA's core mission is to promote sustainable electrification programs worldwide. New opportunities to advance this cause have resulted from the global trend toward privatization, however conventional private-sector approaches has not begun to meet the challenge in terms of funding levels, skills, and motivation. NRECA has a

---

[1] NRECA stands for NRECA's group of international assistance programs and agencies (NRECA International, Ltd.; the NRECA International Foundation, and NRECA Electricity for Progress, LLC); IFC/PSAS stands for the Private Sector Advisory Services of the International Finance Corporation (World Bank Group member).

unique understanding and track-record in successfully mobilizing local communities to seek after their own electrification interest. With the objective of applying this experience as part of current power sector reform efforts, NRECA is seeking alliances with multilateral funding agencies, which hold strategic advantages in terms of capital funds and policy access. With the general objective of accelerating the pace of rural electricity market development to match the need and pace of urban and industrial sector power reform, the task will require nothing less than national-scale market development such as was successfully developed in countries such as Argentina, Bangladesh, Costa Rica, Philippines, and China, all of these cases having relied extensively on local community initiative, investment and organization. NRECA and USAID teamed to formulate a number of these programs during the 1960s and 1970s. NRECA's current mission strategy is to renew this process only with a wider range of partnerships to facilitate commitments of capital and policy support with "buy-ins" from the government and the official-aid community, the local beneficiary communities, and various private-sector providers and financial institutions.

PSAS' Rationale/Mandate

PSAS' basic strategic orientation in the Bank Group as a developer/ implementation agent of utility sector reform puts it in strong position to lead. PSAS' role is to develop and support investment-ready regulatory/institutional and investment programs including teaming with expert private-sector group(s) in the field of consumer-oriented electric supply and marketing enterprises. The proposed initiative will obtain an adequate capital base for an initial five-year program to elaborate practical business strategies in selected countries in concert with broader privatization schemes under PSAS' purview, and take the lead in launching programs with pilot projects.

Implementation Stages/Sequence

- Complete a teaming arrangement and out-reach to other sponsors (financial institutions interested in capturing deals, corporate foundations).
- Execute project agreements including activity scopes, counterpart agreements and budgets, timetables, etc.
- Initiate by devising and implementing remedies for inadequate/faulty legal, institutional, organizational patterns and organize support by key players in government, utility sector leadership and local communities (e.g., revise or install cooperative enterprise laws relating to energy services)
- Develop and implement contracting structures for private-cooperative partnerships in concert with government, regulatory and financial institutions.
- Implement pilots with fees from financial participants.
- Expand program in target countries and add new countries (follow-on phase).

Illustrative Portfolio

The IFC-PSAPT/NRECA initiative is focused on developing sustainable and replicable rural electric utility market systems where they do not exist or are in need of additional support and strengthening. Typical project scenarios for accomplishing this mission fall into three categories:

1) Restructuring/reforming national or sub-national electric utility systems where rural utility performance and service penetration remain at low levels (India, Honduras, Russia, Peru, Haiti, Pakistan, Sri Lanka, Georgia, Albania).

2) Strengthening institutional and market-aggregating capacities where consumer-based rural utility markets exist (Philippines, Brazil, Bangladesh, Costa Rica, Argentina).

3) Creating new rural utility markets and market aggregators in countries where power sector reform/privatization has occurred but rural areas remain underserved (Dominican Republic, Guatemala, Panama, Bolivia).

Resource Requirements

PSAS and NRECA will share in contributing part of the program budget cost, and will jointly solicit funds from other sources to complete the budget requirement. PSAS will provide space, oversight and administrative support for a professional staff of 5 full-time equivalents. NRECA will provide 2-3 of these FTEs. A core program budget of $6 million will be required, supplemented by additional funds for implementing privatization contracts, project feasibility studies and designs, and implementing pilot projects. Assuming an initial focus group of 3 countries, the total budget requirement will be on the order of $20 million, excluding project capital investment costs. Funding for the core budget to be as follows: $1 million from the prime sponsors, $4 million from official-aid sources, development funds and private foundations, $1 million from project activity/contract fees.

Timetable

1. Complete business concept and teaming agreement between primary sponsors (Months 1&2).
2. Budgetary resource mobilization (Months 3-4).
3. Reconnaissance missions to priority countries (Months 2-5).
4. Develop full program strategy including industry business models and plans (Months 5-6).
5. Target country selection and completed business plan including budget, staffing, organization/ logistics, etc. (Month 6).
6. Final commitments of resources and start-up of operations (Month 7).

Financial Plan

Program Core Funding (USD Millions)	
NRECA	0.5
IFC	0.5
Official-aid Agencies	3.0
Private Sponsors	1.0
Fees	1.0
Total	6.0

Illustrative Diagram (attached)

ATTACHMENT B

IDB/MIF NRECA Initiative in Consumer-Based Rural Electric Utility Development[1] (Draft Concept Paper)

December 2003

Project Rationale

Conventional privatization strategies have not been successful in addressing hard-to-serve markets such as rural areas of national and regional concessions. There are different reasons for this, but in every case the underlying economic incentive basis for investors is weak. Also, the skill set needed to overcome frequently-encountered deficiencies in utility concessions attempting to serve such areas is generally not found among the current group of strategic power sector investors. These include low customer density, low energy use and uneconomic capacity utilization, low billing and collection rates, un-funded consumer subsidy mandates, and challenging legal environments.

Cooperatives and other user-based electrification models have exhibited opposite patterns -- higher penetration rates in service localities, emphasis on promoting economic energy use, better discipline in billing and collections. However, cooperatives and similar consumer-based service enterprises have not been favored due to an irregular track record. Nevertheless, NRECA experience around the world indicates that these types of enterprises can be organized to become integral components of overall reform and privatization schemes under a variety of private-sector implementation mechanisms. Policy reforms and financing strategies currently being adopted by the Bank and borrowing member countries for rural electrification development are conducive to this process. Lacking are specific ground-level regulatory/institutional/ business mechanisms and implementation models/ agents with a strong track record of success to help implement such policy initiatives.

NRECA's Mandate

The core mission of NRECA is to promote sustainable electrification programs worldwide. New opportunities to advance these efforts result from the global trend toward privatization. However, conventional private-sector approaches have not begun to meet the challenge in terms of funding levels, skills, and motivation. NRECA has a unique understanding and track-record in successfully mobilizing local communities to organize and promote their own interests in electrification. NRECA is seeking alliances with multilateral funding agencies, which hold strategic advantages in terms of policy and capital access in order to apply its experience as part of current power sector reform efforts. NRECA has worked in the past with the IDB, the World Bank, USAID, and in coordination with other multilateral and bi-lateral agencies to promote policy reforms and

[1] NRECA stands for NRECA's group of international assistance programs and agencies (NRECA International, Ltd.; the NRECA International Foundation, and NRECA Electricity for Progress, LLC), affiliates of the National Rural Electric Cooperative Association.

strategies for the provision of rural electricity. NRECA is a transaction-oriented organization with a strong international reputation, having complementary skills and a shared purpose with IDB electricity sector programs to build successful markets and enterprises in electricity supply and distribution. NRECA already has teams working on the ground in several countries in Latin America and the Caribbean on funded projects toward these goals.

Project Objectives, Activities, and Beneficiaries

With the general objective of accelerating the pace of rural electricity market development to match the need and pace of urban and industrial sector power reform, the task will require, in some cases, national-scale programs similar to successful efforts in countries such as Argentina, Bangladesh, Costa Rica, Philippines, and China, all of which relied extensively on local community initiative, investment, and organization. NRECA and USAID teamed to formulate a number of these programs during the 1960s and 1970s. NRECA's current mission strategy is to renew this process with a wider range and more diverse and flexible network of partnerships taking advantage of recent policy reforms and lessons learned. The goal is to facilitate commitments of capital and policy support with "buy-ins" from the government and the official-aid community, the local beneficiary communities, and various private-sector providers and financial institutions.

This concept is for a special facility focused on making the cooperative and consumer-led electric business enterprise a viable private-sector alternative for expanding and improving electricity service in non-urban areas. The initiative will establish local institutional and technical assistance to support the successful creation and development of electric co-ops and/or strengthen existing cooperatives from the business side, provide technical assistance and mobilize funding. In a typical case --where electric cooperatives have not been established -- agreements would be negotiated with national electrification authorities (governmental energy/electrification agencies, national electric utilities, electric utility concession-granting agencies and regulators, etc.) to initiate projects in jointly defined service territories of generally underserved areas in order to "normalize" and expand electricity and energy distribution/commercialization practices in those areas. As part of these agreements, a general model for organizing private, self-sustaining community electrification corporations will be implemented in a staged transfer arrangement based on the achievement of pre-defined benchmarks.

The initiative will be designed to respond flexibly in the region to different policy and institutional conditions. NRECA is already involved in rural electrification planning and operational support in many countries which will be the starting point to allow rapid progress and early program successes. Although demand and consumer-driven approaches as embodied by the electric cooperative model and other consumer-owned utility formats will be the primary model, the program will be equipped to address a variety of circumstances and approaches. In that context, a specific objective of the program is to do develop sustainable mechanisms for the sharing of best practices among cooperatives and community- based models in the region. Successful cooperatives from

throughout the hemisphere would be recruited to provide peer-to-peer assistance to counterparts in need of technical assistance to improve business operations.

Operational Orientation

The proposed facility would be initiated as a formal partnership ("Partnership") among a group of core partners who are committed to developing, supporting, and assuring the long-term business success of local-community, cooperative infrastructure service business entities around the Latin American and Caribbean region. The envisioned Partnership will consist of NRECA International, Ltd., which will be responsible for building a team of experts drawn from its project teams around the region and from electric co-ops from around the region and possibly from other countries, the NRECA International Foundation, which will be responsible for orchestrating the participation of US electric cooperatives, and MIF. In an initial phase, the Partnership team will establish formal support agreements with the appropriate authorities of selected countries, as noted previously; or, in countries where co-ops exist, agreements will be with national associations of electric co-ops and similar community-owned electricity service businesses. The parties to the country agreements could include governmental agencies (national and local), utilities, banks, co-investors, co-op support agencies and NGOs, etc., as needed to achieve its aims. Each of the agreements will be developed close coordination with energy sector teams of the IDB and other international banks and assistance agencies, the IIC and similar private-sector agencies and special-purpose funds of the banks.

The Partnership will have a defined strategy and implementation plan, pre-selected target countries and a budget, staffing plan and operational term to match. One of the explicit deliverables to be achieved by the project during its term (3-4 years) is a detailed organizational format and business plan for a second-phase entity whose mission would be to expand and develop the initiative in a larger group of countries and to provide a permanent base of financial and "best-practices" support for the region's community-electrification corporation community.

Executing Agency and Operational Components

The first phase of the proposed program would be administered and co-financed by NRECA, which has extensive experience in working with user based electricity systems and demonstrated capacity to mobilize funding and human resources to support such projects in emerging countries world-wide, with special experience in the Western Hemisphere. NRECA will (1) prepare, process, supervise, and evaluate proposals for 5 to 6 pilot projects from a range of diverse countries; (2) mobilize matching funds and monitor local in-kind contributions from partner cooperatives; (3) contract specialized consultants to assist in project design, preparation, and supervision; (4) organize intra-regional mechanisms for the sharing of best practices among cooperatives and other community based electrification entities; and (5) oversee day-to-day implementation of the program through a program management team that will be part of a permanent regional facility designed to provide sustainable support for cooperatives and other user based electrification systems as well as national supporting national entities.

It is anticipated that the MIF and NRECA would enter into an agreement for administration of the program. Under this agreement NRECA would establish a program management team (PMT) to oversee day-to-day implementation of the program. The PMT would identify, develop, and supervise the pilot programs, including the raising counterpart funds and the hiring of consultants, in accordance with guidelines established by NRECA and the MIF. NRECA would provide office space and general support services for the PMT at its headquarters in Arlington, Virginia. The agreement for administration of the program would include guidelines for the submission of projects to the MIF for no objection, procedures for the contracting of consultants, disbursement of funds, and project monitoring and supervision.

Major Activities and Illustrative Portfolio

A key objective will be developing sustainable and replicable rural electric utility market systems where they do not exist or are in need of additional support and strengthening. Typical project scenarios for accomplishing this mission fall into three categories:

1) Restructuring/reforming national or sub-national electric utility systems where rural utility performance and service penetration remain at low levels (Honduras, Peru, Haiti, Guyana).

2) Strengthening institutional and market-aggregating capacities where consumer-based rural utility markets exist with the goal of facilitating market based financing for new builds or expansion. (Brazil, Costa Rica, Argentina).

3) Creating new rural utility markets and market aggregators in countries where power sector reform/privatization has occurred but rural areas remain underserved (Dominican Republic, Guatemala, Nicaragua, Panama, Bolivia).

The main activities of the facility would be to work with local counterparts, host governments and others involved in policy reform in the electric sector of the target country to devise and implement plans for consumer based expansion of energy services. A major purpose is to develop and support investment-ready regulatory/institutional and investment programs including teaming with expert private-sector group(s) in the field of consumer-oriented electric supply and marketing enterprises.

Among essential activities would be crafting remedies for inadequate or faulty legal, institutional, organizational patterns for the expansion of consumer based energy services. Certain countries may require legislative remedies, particularly related to cooperative enterprise laws governing energy services. Depending on the country, support for the cooperative approach will require providing information and organizing support from key members of government, utility sector leaders, and, most important, local communities. As part of capacity-building in countries where existing rural electric cooperatives and utilities are in need of management and operational assistance, utility performance benchmarking will be conducted to inform the beneficiaries and other

stakeholders, including regulators, of improvement needs and strategies for attaining improved performance. Such benchmarks would be integral to the envisioned implementation agreements between the Partnership and local electrification authorities. Another key area of activity would be developing and implementing the appropriate contracting mechanisms for private-cooperative partnerships in coordination with governments, regulatory, and financial institutions.

The primary beneficiaries of this program will be local community business associations who voluntarily cooperate together in order to improve electricity and similar infrastructure services in unserved/underserved areas, following the model of local cooperatives that have been successfully formed in the region for this purpose. Such associations/ cooperatives would encompass households, commercial businesses, farms, industries, public service entities (schools, health clinics, municipal street lighting, etc.) who all typically join and participate equitably in electric co-ops to obtain the benefit of electricity and, potentially, other services that electric co-ops typically add as they become more established, financially strong, and are so directed by their membership to invest in and develop. The countries themselves will benefit from the expansion of reliable power to previously underserved populations and from the establishment of strong private sector cooperatives whose governance can serve as a model to other consumer based organizations. Provision of reliable power to previously underserved areas can increase demand for goods and services and contribute to a stronger local economy. Initial program efforts should be targeted for countries with a range of capacities and needs.

In the implementation of these programs, care will need to be taken to ensure that the efforts are complementary to existing Bank funded policy reforms and other programs. Indeed, inasmuch as the investment programs entail new rural electrification, the project team will engage directly and deliberately with the appropriate government agencies and Bank personnel to assist in establishing administratively efficient means to link public rural electrification financing with the local institutional development, local capacity-building and project implementation support work that essentially comprise the foci of the proposed initiative and a practical approach to creating successful "public-private partnerships." In addition, this coordination will help to guarantee that any operations of the MIF do not duplicate other multilateral efforts and that, where Bank funded programs are in place, that MIF/NRECA resources are utilized for private sector, consumer based initiatives that are not funded by other operations. However, it is expected that the institutions put in place by this operation-- local cooperatives and national market aggregators --would participate in Bank funded rural electrification efforts.

Sustainability

The essential value of the proposed initiative is to establish an on-going, self-supporting framework for creating sustainable and dynamic markets for electricity service provision in non-urban areas of countries throughout Latin America, where, as a region, roughly 75% of rural dwellers do not now receive electricity service. Therefore the envisioned support-and-service entity itself must be sustainable.

As noted, the initial stage would be carried out under a specific budget and plan. The financial underpinning of the program over the longer-run is to be based on the success achieved by its interventions—specifically, the successful development of investment programs and related financing –fees included in financing packages which will assume the successful accomplishment of the institution-building and other activities to be carried out by the JV project team sufficient to merit the commitment of banks' and investors' financing. In addition, the proposed initiative envisions a type of participation payment on the part of the beneficiary associations which entitles access and may also entail an ownership privilege/and responsibility format, following the example of common-service "membership corporations" for financing services, etc., that have been successfully established by cooperative businesses in many developed countries.

Resource Requirements

Counterpart funding is available from a range of sources. NRECA will share in the program budget cost, and will jointly solicit funds from other sources to complete the budget requirement. Partial funding is in place for programs in several countries from bi-lateral sources and from resources that NRECA will provide.

For illustrative purposes, the total budget requirements for an initial regional effort with pilot programs in five or six countries could be in the $50 million range with candidate projects from among the following countries: Argentina, Bolivia, Brazil, Costa Rica, Dominican Republic, Guyana, Haiti, Honduras, Nicaragua and Peru. Components are outlined below.

Purpose	Estimated % of Cost	Sources and Shares
Project development	10%	• MIF (20%) • NRECA (20%) ▪ Donors (60%)
Capacity-building and national program development	15%	▪ MIF (40%) ▪ NRECA (20%) ▪ National counterparts (10%) ▪ Other participants & donors (20%) ▪ Beneficiary co-ops (10%)
Start-up projects (capital costs)	75%	▪ NRECA (15%) ▪ MIF (15%) ▪ National counterparts (10%)

		▪ Beneficiary co-ops (10%) ▪ Third-party financing (50%)

NRECA believes, based on experience, that the necessary counterpart funding, in addition to current amounts, will be available and that it has the capacity to raise counterpart provided there is a strong partnership with reliable entities such as the IDB and MIF. As part of this, NRECA is prepared to initiate a fundraising drive through the NRECA International Foundation to obtain a portion of the needed counterpart.

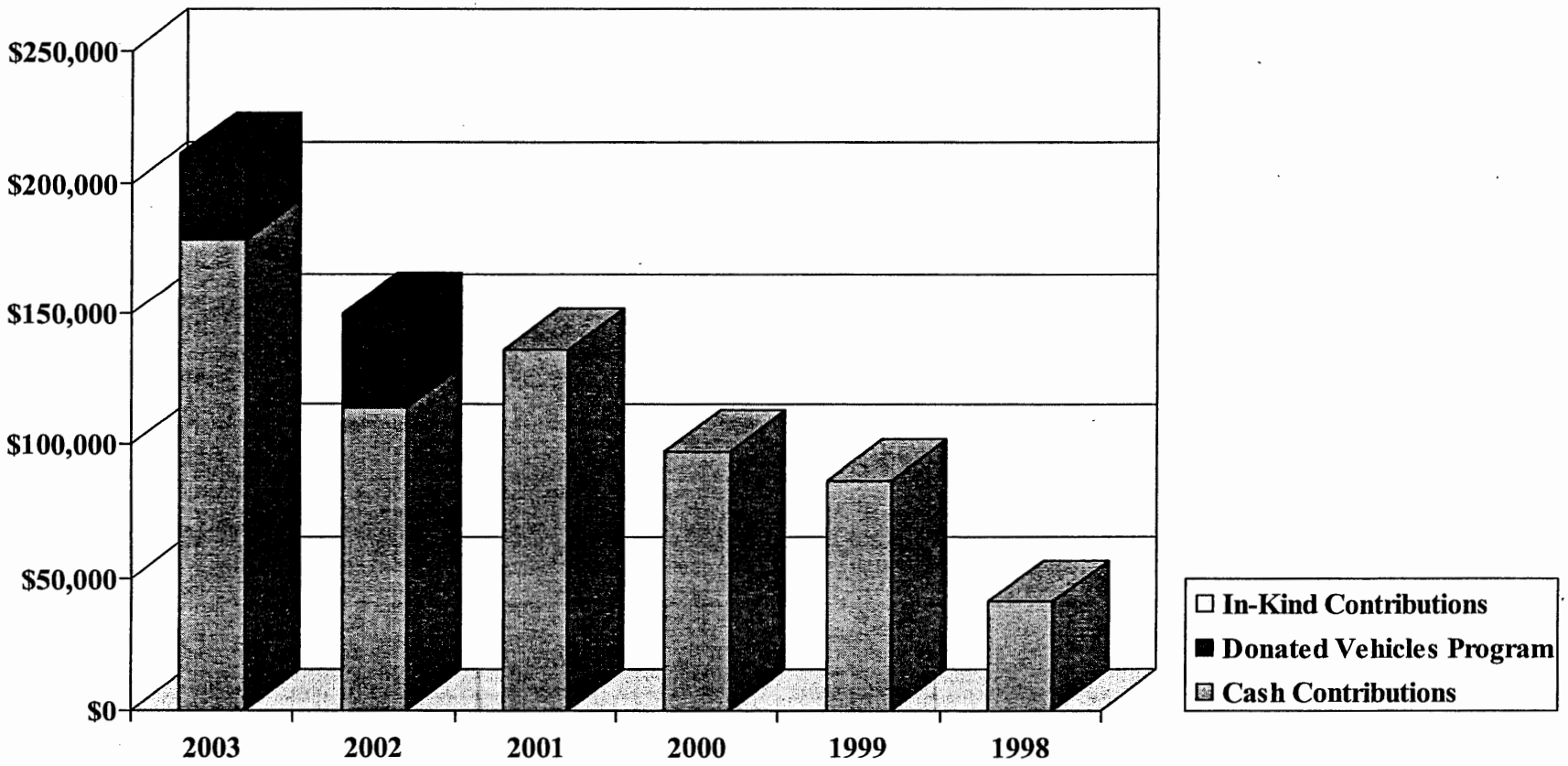
Timetable

The proposed initiative's first phase will be implemented in a 3-4 year time frame for the establishment of an initial group of countries/projects. As noted above, program activity is already underway and would serve as the basis for the start-up.. During the first phase additional countries and projects would be identified as the basis for launching the second "permanent" phase and the establishment of a formal regional entity.

ATTACHMENT C

NRECA International Foundation

Contributions



	2003	2002	2001	2000	1999	1998
Cash Cont	178766	114039	136265	97880	86412	41027
Donated V	32,949	36010				

ATTACHMENT D

ACCESS H_2O

ADVANCING PUBLIC HEALTH AND ECONOMIC DEVELOPMENT IN RURAL TANZANIA WITH SOLAR-POWERED WATER PURIFICATION AND DRIP IRRIGATION

SUBMITTED BY:
Higher Ground Development Corporation
P.O. BOX 1752
MBEYA, TANZANIA
Tzsweetunity42@hotmail.com

DATE: JUNE 2, 2003

ACCESS H2O: A SOLAR WATER PURIFICATION AND DRIP IRRIGATION PROJECT

IMPLEMENTING ORGANIZATIONS

Higher Ground Development Corporation (HGDC) is a Tanzanian corporation and is wholly owned by the David Robinson family. HGDC has its roots in two continents. Headquartered in Dar es Salaam, Tanzania, its infrastructure for operations are in both the U.S. as well as Tanzania. HGDC was incorporated in 1985 to assist Tanzanian coffee growers to enhance the quantity and quality of the coffee they produce as well as the revenues generated from coffee sales. HGDC spearheads regional product consolidation, global marketing and sales activities and serves as the lead consultant to these coffee growers for business and organizational development. With offices and operations in three Tanzanian regions – Mbeya, the Coast and Tabora – HGDC worked with over 600 agricultural producers and co-managed a 27,000-tree coffee farm in 2002.

HGDC is committed to the empowerment of producers. Our objective is to increase producer income and advance community development. By acting as both catalyst and administrative partner, HGDC forms and operates cooperative business models and serves as an international market link for producer organizations. HGDC researches and imports appropriate technologies to promote community and quality-of-life development. As an example, HDGC is leading the effort to bring pure water and new agricultural opportunities to the people of east Africa.

Sweet Unity Farms is a 280 acre coffee farm in the Mbozi District of western Tanzania. Sweet Unity was jointly established in 1989 by the Robinson/Mpunda family and HGDC. Led by David Robinson, Sweet Unity was cleared from thick forest by the Robinson/Mpunda family members. At that time, Sweet Unity families were the first to move beyond the village boundary, into the forest. Today, Sweet Unity Farms employs 21 full-time staff and 50 harvesters and is building a solar powered, multi-media education, retail and community center for the people of Bara. Sweet Unity Farms is a model for sustainable economic and community development.

Tanzania Light & Power LLC (Tz L&P) is a U.S.-based corporation whose mission is to advance human development through the practical and effective use of sustainable technologies. Based in Bara, Tz L&P was created to provide educational, sales and installation services for solar electric and related sustainable energy systems to residential and business clients in rural and urban communities in eastern Africa. Our objective is to advance education, public health and economic growth through access to sustainable technologies. Tz L&P is presently working with one community – Sweet Unity Farms located in Bara, Tanzania – to demonstrate a business model for sustainable development that can be used by communities all around the world. To date, Tz L&P has sold and installed two dozen solar electric systems on the homes and businesses in Bara. With these systems and the new projects proposed herein, Tz L&P is working to address the global disparity in wealth and its many manifestations – the global hunger crisis, limited educational and job opportunities, inadequate healthcare services and the lack of clean water. Tz L&P also provides services as a 501 (c) 3, not-for-profit corporation under the name of the Green Apple™ Corporation, a wholly-owned subsidiary of the 1st Rochdale Cooperative Group, Ltd. of New York, New York, USA.

PROJECT SUMMARY & IMPACT

The objective of this project is to demonstrate a cost-effective irrigation and water purification program, delivered through a community-based, micro-enterprise structure. Using appropriate technology, the design could be replicated by other farm communities and cooperatives in the Mbozi District and beyond. When completed, this system will provide growers with the resources to respond to periods of drought that occur during the time of optimal coffee tree growth as well as clean water to all.

The drip irrigation system will be hosted on five acres of Sweet Unity Farms land. An underground piping system will be installed from the local river to the farm. A diesel pump will move water from the river to four storage tanks - three at the agricultural site and one at the community. Once there, water will gravity feed into a drip irrigation system for the coffee trees and a community vegetable garden.

The community water tank will be accessible to Sweet Unity Farm families (over 200 people) for household and farm use. A solar-powered water purification system will operate here daily. Initially, the water will be dispensed for no-charge. As microenterprise opportunities in Mbozi and the larger cities are assessed, a business strategy for the water purification system will be developed. The goal now is to deploy and demonstrate the viability of the system.

OUR COMMUNITY

The Mbozi District in Tanzania is a community of 350,000, third generation coffee farmers. Although coffee is a multi-billion dollar industry, global coffee prices are currently at 40 year lows. As a result, residents of our community remain impoverished. They lack funds for basic, life-enhancing, social infrastructure; schools, roads, healthcare and clean water.

For two decades, HGDC and the Robinson/Mpunda families have sought to develop practical business and technology strategies that increase revenue from coffee while creating revenue opportunities from new business ventures. This offers growers an opportunity to earn a living wage, to invest in their community and to enhance their quality of life.

For example, to respond to the depressed price of coffee in global markets, HGDC has worked with Mbozi farmers to increase productivity and expand global market distribution for their products.

The focus of HGDC's effort is three fold:

- To create direct-trade access to international coffee markets,
- To organize collective strategic marketing efforts through cooperatives, and;
- To make the tools and equipment needed to produce a superior quality coffee available to the farmers on a credit basis.

In 2003, HGDC proposes to take its mission a step further by addressing a chronic community need for clean-water access for personal consumption and crop irrigation.

ACCESS H2O IN A GLOBAL CONTEXT

The lack of access to clean, safe water remains a problem for over one quarter of the world population. Without water, agricultural opportunities are greatly diminished and personnel survival is at risk. Consider that each year, 1.5 million[1] children die from diarrheal diseases before their 5th birthday. Incredibly, over 2.7 billion cases of diarrheal illness occur EACH YEAR! This equates to almost one case of diarrheal illness annually for every two people on the planet.

Diarrheal illness takes form as cholera, shigella, dysentery, typhoid, E. Coli, and other illnesses. Diarrheal illness is transmitted by contaminated food or water. Over 1.5 billion people do not have ready access to clean water. In Tanzania in 2002, cholera caused approximately 5% of all deaths in the nation. With reasonable access to pure water, many of these deaths could be prevented.

ACCESS H2O: GLOBAL CHALLENGE, COMMUNITY RESPONSE

For the community of Bara and many others around the globe, the challenge of clean water access is both chronic and acute. The nearest water source to the Robinson/Mpunda family farm and their neighbors is a river, 1.2 kilometers away.

This river is used simultaneously as a source for drinking water, bathing, washing clothes and watering cattle. Since the men are in the fields, the women are the primary water carriers. It takes the women of our area over an hour and a half to walk to the river, gather the water in five gallon buckets and carry it back to the village from the river. When full, the buckets weigh over 40 pounds. They make at least two trips per day.

Lack of water access is also a barrier to economic and, in the end, human development. Dependent on rainfall, farmers can only passively wait and pray for the survival of their harvest. Mbozi District farmers consistently lose 8% to 12% of their harvest due to delayed rain. In a bad year, such losses can exceed 25%. Not only do these circumstances result in low crop yield, but the quality is affected as well. Inadequate rainfall and the

[1] Data from the World Health Organization, reprinted in New York Times, May 1, 2003 as, "The Epidemic Score Card"

absence of electricity and the machinery needed to pump water and process coffee render our farmers helpless to respond. As a result, the majority of export-graded coffee rates below FAQ.[2] Such a rating leads to lower prices for the harvest, eroding our farmers' ability to survive and prosper.

HGDC proposes to address the problem of lack of access to clean water and low crop yields (and, hence, the enduring poverty) by establishing an alternative water supply. Using pumps that will be powered by both solar electricity and diesel engines, the water will be used to meet two vital community needs:

- Clean, safe drinking water, using a solar powered water purification system and;
- Reliable irrigation water using a state-of-the-industry, drip irrigation system designed to enhance coffee yields and support food crop growth.

Drip Irrigation and The Life of A Coffee Bean

There is a critical period in the growth cycle of a coffee tree during which the quantity of beans and the quality of the berry is determined. If coffee trees are provided water at those critical times, bean yields and quality can be consistently and dramatically enhanced. This critical

period spans five to seven weeks and occurs in September and October. At this time, the new crop emerges as a flower bud (shown above). Rainfall allows the flower to mature into a flavorful bean.

The success of the flowering process is critical to the plant's ability to produce its highest quality bean. For the flowering process to occur, each coffee tree will consume 20-25 gallons of water per day for four consecutive days within this five - seven week span. Without adequate water, the flower bud, and the bean crop it contains, begin to dry and die on the tree. Dependence on rainwater to sustain crop growth invariably leads to unstable, low quality yields.

Irrigation is the solution to this problem. While year-round rivers and streams exist in most villages, transporting water from these sources (whether by bicycle, ox cart, or even tractor) poses numerous obstacles. Many farmers have attempted and discontinued such efforts. The only viable solution is to install equipment capable of pumping water from the source to the farm and community.

Clean Drinking Water

As mentioned above, the nearest water source to the Robinson/Mpunda family farm is a river, 1.2 kilometers away. The women of our area can spend the majority of their day participating in water gathering.

[2] FAQ, Fair and Average Quality, is the minimum export level classifying standard within the coffee industry.

For members of the Bara village and communities throughout the developing world, these factors – time spent gathering water by adults and school-age children, the expense of charcoal for water boiling (for those who can afford to purify) and the medical costs of treatment when contaminated water is inevitably ingested – are a drain on limited human and financial resources.

Drip Irrigation for Food Production

In the Mbozi District, vegetables are scarce and expensive during the May - November dry season. Since village citizens grow 80% of their own food, the seasonal scarcity of vegetable crops poses a threat to food security and good health within the community. In this design, vegetable gardens and experimental crops, such as vanilla and soya beans, would be irrigated for the majority of the year using the same piping systems that water coffee during the critical, seven-week dry season.

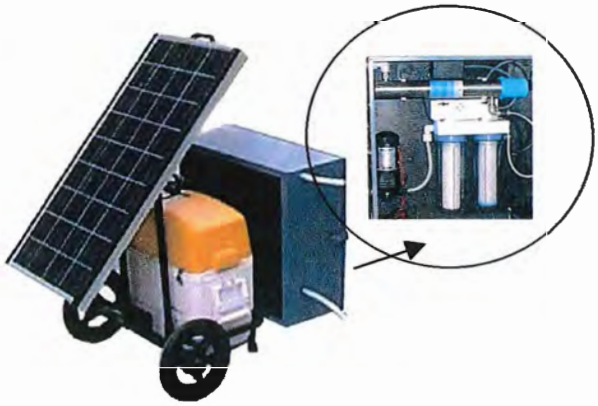
At home and as a commercial venture, vegetable farming will enhance the quality of village life for all. The grower and the consumer will benefit from the income derived from the business and the increased availability of the produce, respectively. Production methods, such as solar drying, could also increase production potential and promote small-scale food processing and retail efforts.

The Harvester™: A Solar Powered, Water Purification System

In an area where numerous illnesses are carried via contaminated water, the importance of a reliable and clean water supply is second only to an absolute lack of access to water of any kind. Tz L&P's response to this problem is to deploy the Harvester, a solar-powered water purification system manufactured by SolarOne of Hartford, Connecticut, USA at the site of the community water tank discussed above. The purpose and function of the water purification system is to demonstrate to a broad segment of the village and ward population that the technology exists to create pure water that is safe, clean, healthy and affordable.

How Does the Harvester™ Solar Water Purifier Work?

The system is powered via electricity generated from the sun. The solar electricity is used to charge a battery, which in turn drives a pump. First, the pump passes the water through a series of mesh and carbon filters that screen out sediment and particulates. Then, to kill bacteria and other microorganisms including Cryptosporidium and Giardia, the water passes through ultraviolet light. The process also eliminates odors and improves taste.



In Tanzania, the system will pump and purify over 1,400 gallons of water each day, sufficient for up to 700 people. Over ten years, the unit will create five million gallons of pure water at a total cost of under ½ cent per gallon! This is substantially below the US$.80 to US$1.00 per gallon charged in Dar es Salaam. While the purchase of clean drinking water within the rural population is limited at present and in spite of the fact that about 25% of village residents now pay for pure water, the vast majority of the people in urban communities now buy bottled water.

Given these market realities, the fact that this purification system is self-contained and portable is also valuable, allowing the system to easily be moved to different sites, in addition to its base site. This will be done throughout the first year. Announcements will be distributed to area residents encouraging them to attend these demonstrations, observe the system, and drink clean, healthy, pure water. People will be invited to bring their own five-gallon buckets and take the water home for free.

With this as a marketing strategy, much of the water from this first purification system will be given away in the first year. Nevertheless, the project's intent is to refine methods of sale and distribution of purified water on a fee-for-service basis to rural and urban citizens. This pilot system will prove the overall potential for the Harvester™ to support clean water enterprises of aspiring, developing world, entrepreneurs. Ultimately, as an engine for microenterprise, the sustainability of the water purification system is linked to the entrepreneur's ability to sell the product – *clean water*.

PROJECT SUSTAINABILITY

The irrigation system and clean water supply will directly impact 25 families (about 175 people) in the surrounding area of the project site. On Sweet Unity Farms, an additional 10 families (about 50 people) will benefit from this project's implementation. Thus, at least 225 persons in the immediate area will benefit from increased access to water for household and commercial farming use. However, as a demonstration, this project will reach many more people. As a microenterprise venture, Tz L&P will use the solar water purification system in urban parts of Tanzania. In addition the announcements mentioned above, word of the project will spread among the citizens of the region and Tz L&P will promote the project in industry newsletters.

Income generated from increased coffee yield, pure water and surplus vegetable sales will be reinvested in the community water system. HGDC will administer the fund, allocating resources for maintenance, repair, and expanded drip irrigation/pure water microenterprise.

PROJECT ACTIVITIES AND TIMETABLE

July to August 2003:	Procure technical assistance from irrigation engineers for project implementation. Purchase and install equipment
September to October 2003:	Begin crop irrigation. Set up and operate solar water purifier.

REQUEST FOR FUNDING

HGDC requests funding of $19,500 to install a community drip irrigation on a five-acre coffee and two-acre vegetable crop production and demonstration site and solar-powered water purification unit. These systems will be designed for small-scale farmers who have limited technological experience and financial ability to invest in equipment to begin to advance their personal, family and community well being.

PROJECT BUDGET

1. Diesel Engine (25 horsepower)	$2,000
2. Water Pump for Diesel Engine	$1,000
3. Solar Water Pumps	$1,500
4. Drip Irrigation Water Pipes (2 kilometers)	$2,000
5. Water Tanks (4) • Community Tank • On-Farm Tanks	$1,500
6. Drip Irrigation Piping System (Delivered to Tanzania) • 5-acre Coffee Tree "Yield Enhancement" • 1-acre vegetable gardens	$4,500
7. Labor for Irrigation System Installation	$1,200
8. Harvester ™ Solar Powered Water Purification System (Delivered to Tanzania) • Complete System includes: o Charge Control & Power Center o Solar Electric Power Panels (150 Watts) o AGM Battery (105 a-hr) o Ultraviolet Light (including spare parts) o Particulate Filtering System (1 year supply) o Mobile Rack System	$3,500
9. Travel & Contingency	$2,300
TOTAL	**$19,500**

ATTACHMENT E

Economic Community of West African States (ECOWAS)

West African Power Pool (WAPP)

Fifth Meeting of the ECOWAS Energy Ministers, Members of the WAPP Steering Committee

FINAL COMMUNIQUE

1. The ECOWAS Energy Ministers, members of the Steering Committee of the West African Power Pool (WAPP), met at the Hôtel Méridien Président in Dakar, Senegal, on November 7, 2003, presided by His Excellency, Maître Abdoulaye WADE, President of the Republic of Senegal.

2. In his opening address, Maître Abdoulaye WADE, after welcoming the participants, emphasized the underlying philosophy of the NEPAD initiative, the untapped energy potential of the West African sub-region, and the need for continued improvement of generation and transmission infrastructure. He then requested that the Member States include the Souapiti site in the list of WAPP priority projects and the NEPAD action plan. He concluded by reaffirming his willingness to assist the member states in their efforts to carry out the Community energy programme.

3. The main objective of the meeting was, to review progress on WAPP activities already underway involving the Member States, donors, and the Executive Secretariat of ECOWAS, and to examine and adopt the recommendations of the Steering Committee related to:

- the ECOWAS initiative on rural electrification;
- the Energy Observatory Budget ;
- the European Initiative to access sources of financing from the European Development Fund for the electricity sectors of the ACP countries;
- and the short-term priority projects in Zone B.

4. The following Member States took part in this important meeting: Benin, Burkina Faso, Côte d'Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Mali, Niger, Nigeria, Senegal, Sierra Leone and Togo.

5. The following regional and sub-regional organizations and development partners were present at the preparatory meeting : Communauté Electrique du Bénin, US Agency for International Development, French Ministry of Foreign Affairs, European Investment Bank, ECOWAS Bank for Investment and Development, Agence Française de Développement, Organization for the Gambia River Development, the Union of Producers and Transporters of Energy in Africa, West African Economic and Monetary Union, World Bank.

6. This week of meetings benefited greatly from the hard work and dedication of the team of consultants, financed by the technical assistance, who were responsible for the stability study, the preparation of the investment program, and the development of the interconnections between the Member States' national grids. Thus, the Steering Committee expresses its thanks to: Associates for International Resources and Development, Emergence Consulting, Institut de l'Energie et de l'Environnement de la Francophonie, National Rural Electrification Cooperative Association, Nexant/EDF, PA Consulting, United States Energy Association.

7. The Steering Committee, after examining the Project Implementation Committee report, adopted the following Resolutions :

a) The Resolution related to the Rural Electrification Initiative to be undertaken in collaboration with the National Rural Cooperative Electricity Association, in order to develop a sustainable institutional framework to attract the investment needed for rural populations to gain access to energy;

b) The Resolution related to the Energy Observatory budget, specifying the resources needed to put in place the minimum staff necessary for the launch and operation of the Observatory, including equipment, training, and capacity building;

c) The Resolution related to the European Initiative on Energy for Poverty Eradication and Sustainable Development of the ACP countries via European Development Fund financing;

d) The Resolution related to the short-term Zone B priority projects, calling on the ECOWAS Executive Secretariat to request that the World Bank include these projects in the investment program being developed. The Secretariat should also request the African Development Bank to agree to fund the detailed pre-project studies, the bidding documents, and the environmental impact assessments.

8. The Steering Committee expressed its satisfaction to the development partners for their generous and unyielding commitment to support the development of the WAPP. The Steering Committee also took note of the encouraging signs of cooperation emerging from the fourth meeting of the WAPP donor coordination committee in Dakar on November 5, 2003.

9. The Minister of Mines and Energy of Senegal, Mr. Madické NIANG, was designated Chairman of the West African Power Pool Steering Committee for a term of one (1) year, renewable one time.

10. The SENELEC Director General, Mr. Samuel SARR, was designated Chairman of the Project Implementation Committee of the West African Power Pool for one (1) year, renewable one time.

11. Finally, the WAPP Steering Committee expressed its profound gratitude to the people and government of Senegal, in particular to His Excellency Maître Abdoulaye WADE, President of the Republic of Senegal, for the warmest welcome and hospitality accorded during their visit in Dakar.

Done in Dakar, on the 7th of November 2003

For the Steering Committee

The Chairman

Me Madické NIANG

Resolution °1

Relating to the Rural Electrification Program

The WAPP Technical and Institutional working groups during their joint meeting in Dakar on the 5th of November 2003,

Considering:

- That the Authority of Heads of State and government adopted the decision A/DEC.5/12/99, which contemplated the creation and development of a West Africa Power Pool;

- That the Council of Ministers promulgated Regulation C/REG.7/12/99 relating to the adoption of a Master Plan to develop means of energy production and interconnection of electricity networks of the ECOWAS Member States;

- That there is an urgency to accelerate the WAPP implementation process in order to bring electricity to all the people of West Africa as quickly as possible;

- That in line with the U.N. Millennium Development Target to halve poverty by 2015, and the goals and objectives of the Poverty Reduction Strategy Papers (PRSPs), the ECOWAS Secretariat must address the near-total lack of access to modern energy sources facing the region's rural population.

Therefore, the technical and institutional working groups request that the ECOWAS Executive Secretariat, in collaboration with the National Rural Electrification Cooperative Association (NRECA) of the U.S.:

I. Develop a rural electrification white paper together with the Member states to include a regional program strategy, an action plan, an investment program related to access to power;

II. Submit the rural electrification strategy proposed by the ECOWAS and NRECA to a Regional Forum for validation.

Done in Dakar, November 7, 2003

For the WAPP Steering Committee

The Chairman

Resolution N° 2

Relating to the budget of the Energy Observatory

The ECOWAS Energy Ministers, Members of the WAPP Steering Committee, during their meeting in Dakar, on November 7, 2003,

Considering:

- **That the ECOWAS Revised Treaty, of July 24, 1993, reaffirmed the principles set forth in the Treaty of May 28, 1975 establishing ECOWAS for the purpose of encouraging cooperation among the Member States in the areas of economic development and, to this end, favouring the free movement of people and goods between States;**
- **That the Authority of Heads of State and government adopted the decision A/DEC.3/5/82 relating to the Energy Policy of ECOWAS;**
- **That the Member States have demonstrated their will to coordinate their efforts with a view to implementing the ECOWAS priority action plans, notably those relating to the interconnection of infrastructure;**
- **That the Authority of Heads of State and government adopted the decision A/DEC.5/12/99, which in article 2 created a coordinating structure for the meeting of Energy Ministers and the Committee of Chief Executives of the Transmission System Operators of the Member States and defined its attributes;**
- **That the Council of Ministers promulgated Regulation C/REG.7/12/99 relating to the adoption of a Master Plan to develop means of energy production and interconnection of electricity networks of the ECOWAS Member States;**
- **That the Memorandum of Understanding was signed by the ECOWAS Ministers of Energy in Lomé, on September 29, 2000, committing the signatory Governments;**
- **That the Summit of the Heads of States and Governments adopted Decision A/DEC.2/01/03 relative to the creation of the ECOWAS Energy Observatory, the first component of the WAPP Information and Coordination Centre;**
- **The need to ensure rapid commencement of the operation of the Observatory in a transitional period.**
- **The French Ministry of Foreign Affairs will supply the Energy Observatory with the equipment and technical assistance needed for its planning and launch.**
- **The French Cooperation (AfD) will provide the resources necessary for capacity building activities of the Observatory, considering its functional interdependence with regional regulation. The minimum resource requirement for the capacity building is estimated at €1,000,000 subject to validation by the Steering Committee based on a feasibility study.**

- That USAID will dedicate part of its resources to the capacity building and training programme adopted by the ECOWAS Council of Ministers to develop the Observatory.

ADOPT

1. A salary scale for the Observatory professional personnel benchmarked on the salary scale for the expatriate staff of the ECOWAS Executive Secretariat taking into account the companies' payment ceiling as agreed by the Implementation Committee.

2. The initial organisational chart and work plan elaborated and adopted by the WAPP Technical Working Group in Cotonou in February 2003.

3. The work plan and the 2004 operating budget for the Observatory staff salaries and operational expenditures amounting to US$ 164,000, including US$ 31,000 for the operational expenditures that will provided by donors upon approval. The staffing consists of the Coordinator, two engineers, a secretary and an accountant, with these last two positions to be recruited locally.

4. Responsibility for professional staff salaries by the seconding electricity companies.

5. The ECOWAS financial regulations the expenses related to the launch and operation of the Observatory.

REQUEST:

6. The electricity utilities to take the necessary steps in compliance with existing regulation to finance the salaries and benefits of the Observatory staff.

7. The Executive Secretariat to contribute US$31,000 to finance the Observatory operations;

8. Deposit the contributions in a bank account established for the Observatory in Cotonou.

9. The Minister for Energy of Benin to designate the Director General of SBEE as principal administrator and the Observatory Coordinator as assistant administrator as regards the approval of expenses related to the Observatory's operations.

Done in Dakar, on the 7th day of November 2003

For the WAPP Steering Committee

The Chairman

Resolution N° 3

Relating to the European Initiative on Energy for Poverty Eradication and Sustainable Development

The WAPP Steering Committee during its meeting in Dakar on November 7, 2003,

Considering:

- **That the ECOWAS Revised Treaty, of July 24, 1993, reaffirmed the principles set forth in the Treaty of May 28, 1975 establishing ECOWAS for the purpose of encouraging cooperation among the Member States in the areas of economic development and, to this end, favouring the free movement of people and goods between States;**
- **That the Authority of Heads of State and government adopted the decision A/DEC.3/5/82 relating to the Energy Policy of ECOWAS;**
- **That the Member States have demonstrated their will to coordinate their efforts with a view to implementing the ECOWAS priority action plans, notably those relating to the interconnection of infrastructure;**
- **That the Authority of Heads of State and government adopted the decision A/DEC.5/12/99, which in article 2 created a coordinating structure for the meeting of Energy Ministers and the Committee of Chief Executives of the Transmission System Operators of the Member States and defined its attributes;**
- **That the Council of Ministers promulgated Regulation C/REG.7/12/99 relating to the adoption of a Master Plan to develop means of energy production and interconnection of electricity networks of the ECOWAS Member States;**
- **That the Memorandum of Understanding was signed by the ECOWAS Ministers of Energy in Lomé, on September 29, 2000, committing the signatory Governments;**
- **That the European Initiative, a joint effort of the European Commission and the Member States of the European Union, seeks to integrate energy policies into the sectoral policies included in the strategic contracts of the fight to reduce poverty (PRSP, Country Strategic Contract, etc.);**
- **That the European Development Fund is the principal instrument for allocating the official development assistance of the European Union for the benefit of its partners in the ACP countries;**
- **That the European Parliament has adopted a 5-year program called « Intelligent Energy for Europe » of which the component "COOPENER" (2 millions d'euros) is designed to facilitate the «energy dialogue » between the European Union and its developing country partners to assist them in developing appropriate energy policies needed for their economic and social development.**

- That the European Initiative, related to the sustainable energy development of the ACP countries, aims to promote a strategic partnership between the ACP countries, on the one hand, and the European Commission and EU Member States on the other hand, in order to integrate energy as a priority into the official development assistance program of the European Union.

RESOLVES THAT the ECOWAS Executive Secretariat should:

I. Play an active role in the Nairobi Conference in order to contribute to the design and execution of this strategic partnership;

II. Submit a draft resolution to the ECOWAS Council of Ministers requesting that this body engage in a dialogue with the Council of Ministers responsible for the Cotonou Protocol so that energy investments may be considered among the programmes eligible for financing under the European Development Fund.

Prepared in Dakar on November 7, 2003,

For and on behalf of the WAPP Steering Committee

Chairman

Resolution N° 4

Related to the Zone B Short-Term Priority Projects

The WAPP Steering Committee during its meeting in Dakar on November 7, 2003,

Considering:

- **That the ECOWAS Revised Treaty, of July 24, 1993, reaffirmed the principles set forth in the Treaty of May 28, 1975 establishing ECOWAS for the purpose of encouraging cooperation among the Member States in the areas of economic development and, to this end, favouring the free movement of people and goods between States;**
- **That the Authority of Heads of State and government adopted the decision A/DEC.3/5/82 relating to the Energy Policy of ECOWAS;**
- **That the Member States have demonstrated their will to coordinate their efforts with a view to implementing the ECOWAS priority action plans, notably those relating to the interconnection of infrastructure;**
- **That the Authority of Heads of State and government adopted the decision A/DEC.5/12/99, which in article 2 created a coordinating structure for the meeting of Energy Ministers and the Committee of Chief Executives of the Transmission System Operators of the Member States and defined its attributes;**
- **That the Council of Ministers promulgated Regulation C/REG.7/12/99 relating to the adoption of a Master Plan to develop means of energy production and interconnection of electricity networks of the ECOWAS Member States;**
- **That the Memorandum of Understanding was signed by the ECOWAS Ministers of Energy in Lomé, on September 29, 2000, committing the signatory Governments;**
- **That Decision A/DEC.8/121/01 with respect to the financing mechanisms of the WAPP project was adopted by the ECOWAS Heads of State and Government;**
- **That in the context of the stability study of the interconnected WAPP grid already underway, a new Master Plan will be established confirming the list of priority projects, including those in Zone B and an interconnection linking Nigeria and Burkina Faso passing through Niger;**
- **That the gap between the countries of Zone A and Zone B was expressed as a concern by the Steering Committee during their fourth meeting held in October 2002 in Conakry;**

RESOLVES THAT the ECOWAS Executive Secretariat should:

I. **Request the World Bank to do the necessary to include the Organisation pour la Mise en Valeur du Fleuve Gambie – OMVG (Sambangalou, and interconnection lines) in the WAPP investment programme under preparation;**

II. Urge the African Development Bank to initiate studies on EPC and EIA for these projects to enable the World Bank and other donors to consider financing these projects;

III. Collaborate with OMVG in order to further implementation of the project;

IV. Mobilize the financing related to the preparatory studies of the identified projects (project development studies, feasibility studies, environmental impact studies and bidding documents).

Prepared in Dakar on November 7, 2003,

For and on behalf of the WAPP Steering Committee

Chairman

ATTACHMENT F

NRECA INTERNATIONAL LTD.
4301 Wilson Boulevard · Arlington, VA 22203-1860 • Telephone 703-907-5500

Concept for Electrification Project in Yei, South Sudan

August 2003

The Sponsors

NRECA International, Ltd. is a non-profit subsidiary of the National Rural Electric Cooperative Association, established in 1942 as the national service organization of rural electric cooperatives providing electricity in 70% of the land area of the U.S. Electric cooperatives are non-profit, consumer-owned public service utilities chartered as private corporations responsible for their own financial and operational welfare. NRECA's members serve 35 million people with a physical infrastructure totaling $76 billion including 35,000 MW of power generating capacity and 2.2 million miles of distribution lines.

NRECA has operated a non-profit international assistance program since 1962, mostly in partnership with the U.S. Agency for International Development, the U.S. government's lead foreign assistance agency. NRECA has helped to establish and support electric cooperatives in countries around the world and today over 50 million people receive electricity from electric cooperatives developed by USAID/NRECA projects.

USAID and NRECA have been discussing plans to provide rural infrastructure development assistance in South Sudan, and in consultation with representatives of the SPLM, have identified a region in an agriculturally productive area of Sudan as the basis for developing a specific project.

Project Purpose

This is to be a rapid-response project to initiate commercially sustainable electricity service in the town of Yei located on the western bank of the Nile. The project will provide organizational as well as tangible assistance to the Sudanese in the sense of helping to establish a people-led, cooperative enterprise model that will demonstrate how local communities in the South can achieve major accomplishments using a grassroots democratic approach.

The project is intended to act as a symbol of South Sudan's brightening future now that peace has arrived, and the willingness and capability of the American people to help in bringing prosperity to its people.

Setting

Yei is located in the southern-most tip of Equatorial Sudan bordering Uganda and the Democratic Republic of Congo. Yei County has an estimated population exceeding 300,000 and its center is the town of Yei with population of about 36,000. Yei County is located in one of the more agriculturally productive regions in Sudan and prior to the war, exported food to Juba as well as Zaire. Severe bombing by the government has since devastated the county's infrastructure, which has not been restored and restricts its economic viability today. The proposed project will be developed with the idea of setting an example for the role of electricity in rebuilding South Sudan and would be designed to match up with other planned projects in agriculture, health and other public services, commercial and industrial development, etc. Whereas Yei has been pre-selected for this project, an in-country assessment will be necessary to confirm the practical and comparative basis for proceeding with this locale.

Project Parameters

Based on the on-site assessment of the situation in Yei, including an evaluation of priority energy needs, the project will be scoped to provide a reliable, medium-term (2-5 years) power supply solution to accommodate the restoration of commercial activity in the town, extend electricity for priority agriculture-related end-uses especially to enhance post-harvest yields, storage, etc., and provide electricity to schools, health clinics and

other social service projects. A certain amount of residential service will also be included, which will be limited by the capacity of the power source and available funding.

Through a sister charitable giving organization, the NRECA International Foundation, NRECA International intends to obtain and ship donated electric power utility equipment from willing U.S. rural electric cooperatives as the basis for setting up electricity service in Yei. NRECA is discussing the donation of two or more baseload containerized diesel generator sets from an NRECA member co-op in Alaska, with the intention of providing 24-hour power supply of between 1 MW and 2 MW. For the distribution system, we anticipate donating some and possibly all of the following project components: line hardware for distribution system construction, distribution transformers, protection equipment, meters and service drop material and street lighting. Complementary funding will be needed to cover the money costs of materials not donated (e.g., distribution poles, conductor, fuel storage tanks and water cooling system, spare parts/overhaul kits for the generators, and on-site civil works required) and services (e.g., generator preparation, packing, and shipping costs, contractor services for site prep and construction of major installations as needed). Funding will also be needed for project administration, technical assistance, and other related costs including travel expenses. NRECA intends to recruit volunteers from its member co-ops to assist its project personnel in line construction supervision, operator training, etc.

Given the possibility of obtaining donated second-hand generator sets for the project, a permanent electricity supply solution is not envisioned nor it is probable that all of the potential electricity demand in Yei could be met. Moreover, it is NRECA's intention to install a system that can provide a reliable service so our offer is contingent on the availability of complementary funding to assure a complete and well-developed project. The envisioned project will include the following basic components that will constitute NRECA's responsibilities in the project:

- Preliminary on-site assessment and project planning
- Project design, materials list development, and procurement of items to be purchased
- Selection, inspection, preparation and shipping of donated project components
- System installation and construction supervision, line staking, etc.
- Development of an organizational and operational plan
- Initial system operation
- Selection/training of local counterpart personnel to take over operational responsibilities
- Assistance in setting up a utility governance and management framework including training

NRECA will also assess the downstream requirements -- long-term power supply options-- and opportunities including expanding energy supply to serve outlying agricultural energy demand and stand-alone energy services, such as solar home systems.

We are approaching this project with the attitude of committing in the future to a longer-range offer to provide extended support not only in Yei and Yei County but throughout South Sudan. In broader terms, we are committed to the prospect of helping to get rural electrification underway in many parts of the Continent, where less than 5% of the rural population has electricity, a penetration level far below other regions of the developing world. We are developing an innovative rural electrification program in a nearby region of Uganda, and we are interested in determining from the proposed Yei project how to proceed in South Sudan.

Technical, Organizational, and Operational Issues

The envisioned project will provide for power generation, distribution, and related administrative/operational capabilities, meaning in effect that we intend to set up a functioning public utility in Yei on virtually a turnkey basis. The expense and effort of this kind of undertaking is only justified if the equipment will be properly maintained and a system for paying operating expense including fuel and personnel is assured. Some of the specific issues that will need to be resolved include the following:

- Asset ownership/organizational system and related legal/licensing/regulatory issues
- Appropriateness/modification of U.S.-standardized electrical equipment for South Sudan use
- Selection/availability of appropriate sites for power plant and other facilities (e.g. spares and consumables inventory/storage)
- Fuel supply and storage arrangements
- Electricity demand and willingness/ability of consumers to pay
- Availability/arrangements for construction services and technicians (Sudan or neighboring country)
- Determination of any adverse environmental impacts & mitigation measures
- Potential problems with contractor services and equipment procurement for a project in S. Sudan
- Logistical issues regarding in-country transfers and accommodation of temporary project personnel

There are a number of detailed practical questions within these broad topic areas that could be impacted by issues such as time restriction relating to funding, weather-related transport issues, procurement/importation processes and lead-times, etc. In addition to these on-site questions, NRECA will need to arrange for inspection and preparation of project components to be obtained in the U.S. This will include, in particular, inspection and preparation of the power generating equipment.

Funding Requirements and Sources

Description	USAID Funded	NRECA Funded or In-Kind	Total Cost
Project Administration	$ 750,000	$ 50,000	$ 800,000
Power Plant Installation	1,500,000	1,000,000	2,500,000
Distribution Line Construction	1,200,000	440,000	1,640,000
Sudanese Operations Training	50,000	10,000	60,000
	$ 3,500,000	$ 1,500,000	$ 5,000,000

NRECA International, as a self-funded technical assistance corporation, does not have a source of funds or budget for any work in Sudan. We are able to provide funding to cover personnel costs for preparing a complete proposal and for conducting the on-site preliminary assessment however not for the travel costs from the U.S. to Sudan. In order to save time, we are also willing to entail a certain amount of additional pre-contract labor costs to begin work on critical path tasks on the basis of a pre-award notification of allowable expenses from USAID.

Project Benefits and Risks

An electricity project in Yei will have many potential benefits, depending on the actual electricity needs and end-uses and also on the reliability of the system. The specific project benefits will be clearer upon completing the preliminary on-site assessment, but we anticipate that at minimum the electricity project will provide for basis for the following measurable benefits:

- 24-hour electricity service for all commercial and industrial establishments
- Cost and environmental mitigation from displacement of small diesel and gasoline generators
- 3,000 or more domestic service connections including related cost and time-saving benefits in substituting traditional energy (except cooking fuels) -- depending on the amount of (higher priority) non-residential electricity demand
- Improved quality of public water service and quality (see below)
- Public lighting and related community "sense of security"
- Enhancement of health and educational services
- Increased agricultural productivity (e.g., improved grains processing, fish cold storage, etc.)

An accompanying public water supply project should be considered including funding for pumps, water conveyance structures & piping, storage/distribution and water filtration/purification. Consideration should also be given to including a micro-financing component to accommodate consumer house-wiring and electricity end-use equipment. If a cooperative is formed as the organizational basis for the electric service enterprise, this could be easily accommodated in the financial and customer service system of the electric co-op, as was done in the U.S. rural electrification program starting in the post-Depression era.

There are risks involved in the envisioned project. Donated second-hand power generating equipment, particularly when operated in a rugged and remote tropical location, could result a higher incidence of interrupted service as well as shorter operating life. There is also the risk of damage during shipping and installation. We will budget for the cost of technical inspection, repairs as needed, and also for a prudent number of spare parts as well as a supply of consumables (filters, etc.). There could also be operational problems with the distribution system especially post-construction although this is unlikely. We will engineer the system to facilitate maintenance (e.g. right-of-way clearing). There are also risks relating to management issues, such as enforcing connection and payment policies with consumers. Unless funding is available from other sources to pay for fuel, spares, and operating personnel costs, the system could eventually fail for financial reasons. Finally, NRECA will design the system to be an operationally safe power plant and electric distribution system, but there is always the chance of accidents both to operating personnel and to the public at large.

Implementation & Timetable

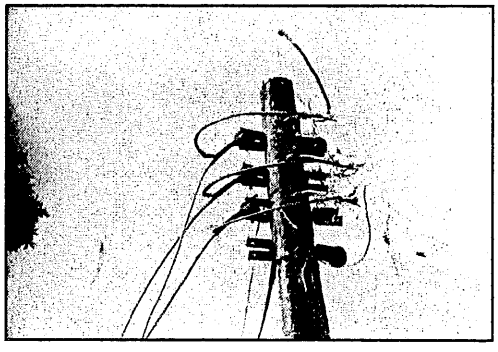
The project would be scheduled for implementation over a 12-month period. The critical path items are (1) completing project funding, (3) procurement of needed equipment and services; and (2) shipping of the generators. We will explore ways of mitigating delays as part of preparing a full proposal.

Sudan Mission Summary

Overview

OCDC headed a field mission to assess the conditions and evaluate the development obstacles facing the people of Southern Sudan. James Willis of NRECA participated in this field mission to review the energy situation and determine the development potential of electricity for the region. James visited the communities of Yei, Maridi, Yambio, and Rumbek in Southern (New) Sudan, and in each community completed an evaluation of the current electricity supply situation, identified remaining infrastructure from pre war electricity supply systems, and determined the existing energy use of the local populations.

Currently, electricity use in each community is restricted to NGO compounds and a few community commercial enterprises that have access to small generators. These generators provide power for lighting for a few hours daily, with a few NGO and UN compounds powering computers and Internet access.



Remnant of early electric distribution system

Each of the towns visited once had commercial grade electricity provided from central station generators with service level (low voltage) electricity distributed throughout the commercial and key residential areas. Each of these systems fell victim to the ravages of the conflict with only a few infrastructure remnants remaining.

Electricity Supply

There is a need for a tiered approach to electrifying Southern Sudan. This approach will assist the country in transitioning from a humanitarian relief environment to long-term sustainable development.

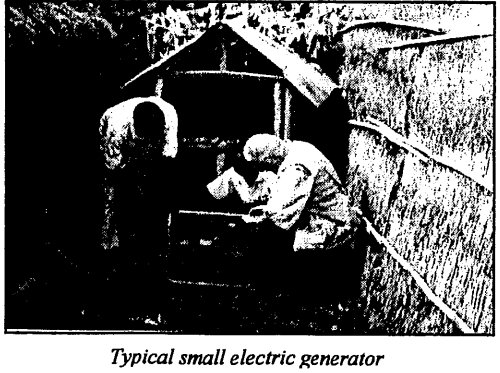
Organizing the Electric Systems

Cooperatives within Sudan are widely accepted and appreciated which is ideal for establishing a co-op based organizational approach.

Findings

Throughout the region, the communities exist largely without electric service. Each of the existing NGOs has their own small generators that provide limited electric service a few hours each day. The local government offices have little or no access to electricity though one office did have a small generator sitting in the foyer. Even the existing telecommunications office did not have electric service except limited access to a small solar system that powered their VSAT e-mail system for about two hours a day.

A few local businesses have the most extensive use of electricity. These small shops and commercial enterprises commonly employed small generators to provide lights. One entity in Yei used a small generator to power a refrigerator and satellite tv during the evenings and to provide lights to a pharmacy. The owner used the electricity to provide value added services to his customers, charging a premium for cold drinks and entertainment.



Typical small electric generator

Only the AFEX compound in Rumbek, a commercial enterprise headquartered in Kenya, had 24-hour electric service and used electricity for substantially more than just lights. They also used electricity for air-conditioning in two buildings, and refrigeration, as well as for computers and Internet service.

Old generator building in Yei, New Sudan

Previous Electric Service

Each community visited was once served by central station generation and a low voltage distribution system. These were destroyed in during the conflict though remnants of the infrastructure can still be found. The following table details the previous generation facilities, and also highlights some of the better on-site generator systems now in operation.

Town	Generator	Year	kVA	kW	# Units	Total Available kW	Distribution	Notes
Yei	Elin	1976	125	100	6	600	Low voltage 415/240v	Only a few poles left in town
Maridi	N/A	-	-		-	-	Low voltage only	Nothing left of electric sys
Yambio	Leroy – Somer	1975	120	96	4	384	Low voltage 415/240v	Most pole left standing
Rumbek	N/A	-	-	-	-	-	-	Nothing left of electric sys
Other Generator Sites of Interest								
Yambio TV station	ONAN		100	80	3	240	240/416v	Old Generators on site, but not repairable
Operating Compound Generators								
Yambio UN Compound Generator Large	Olympian (Cat)	2001	27	21.6	3	55	415/240v	Maintained under contract by Caterpillar dealer in Nairobi Operated by local electrician
UN Compound Gen: Small #1	Olympian (Cat)	1998	20	16	3		415/240v	
Gen: Small #2	Olympian (Cat)	2001	21.8	17.4	3		415/240v	
Rumbek AFEX Compound Units #1 & 2	F.G. Wilson	2002	20	16	3	32	415/240v	Maintained by company electrician from Kenya
Unit #3	F.G. Wilson	1998	14	14	1		240v	Now used only for Backup unit

Existing Local Energy Use

The local population currently pays for energy in the form of dry cell batteries, charcoal, wood, and kerosene. Access to electricity will replace or reduce some of these other energy sources. However, most existing cooking fuels are not likely to be replaced in the near future, though with effort some electric cooking and heating options may be introduced over time.

Fuel Source	Quantity Purchased/Wk	Avg / Unit Cost (GSch)	Total Monthly Cost
Kerosene	1 litter	1500	6000
Batteries, dry cell	2 pair	700	5600
Charcoal	1 bag	2000	8000
Wood	2 loads	1000	8000
Diesel	0.25 litter	2000	2000
Approx Cost/ $ mth	$15.00	Total Cost/ Mth UGC	29,600

Cost of Fuel and Specific Examples

In each area limited quantities of diesel fuel are available from commercial vendors. The fuel is supplied in 200 liter drums. The existing local cost per drum delivered varies with the cost of transportation. 1) in Yei the local cost per 200 ltr drum delivered is approximately $150 (250,000 UGX), 2) in Rumbek, the local cost of fuel is about $107/drum delivered.

In Rumbek, a local trader would be willing to negotiate quarterly contracts that would immediately reduce the cost of fuel to $65/drum. The price throughout the region would become increasingly competitive as the roads and accessibility are improved, as well as access to natural gas.

Approach

Restoring electric service in key communities of New Sudan will require unique solutions based on the circumstances and situation at hand. This is due to the tremendous number of variables affecting infrastructure restoration, especially electricity restoration; therefore, there is no cookie-cutter approach to establishing or reestablishing electric service within the devastated areas. However, there are steps that can be taken to begin to bring the lights back to these towns. The following outlines the initial electrification efforts that should be taken in New Sudan.

Electricity Supply

The approach to electricity supply will require much more detail than can be provided here, however a quick-cut at a reasonable approach provided below.

The initial task will be to consolidate the scattered micro-generation electric systems into a single energy platform. This will bring economy of scale and increased efficiency to the dispersed generation now in use, and provide an immediate increase the availability of electricity within the commercial centers using existing fuel supplies. The installation of streetlights should be a priority. Streetlights effectively increase the level of safety and lengthen the functional business hours for the small commercial enterprises.

Existing pole with streetlight

This first step will provide electricity from banks of diesel generators located in each community. Initially there will be a need to bring about

twelve 75 kW generators in from Kenya. These units should be initially operated under contract with the supplier in Kenya. The distribution requirements for each town would be approximately 4 line-km of three-phase primary along with a complementary levels of secondary, associated line material, and special equipment such as transformers and meters.

Diesel should be purchased by contract from suppliers now working in the country on three-month contracts. This will allow for continuous supply of fuel while allowing for price competition that will bring the cost of fuel down dramatically once peace is established.

The second step should take place after the roads are improved, adequate fuel supplies secured, and electricity demand increases. At this point additional generation utilizing combined-cycle generators is expected to be employed. These units can be quickly and efficiently installed in 100MW increments. This should remain a favorable option as the unit cost continues to decline while the ease of installation for these modular systems grows. During this same period the development of other alternative energy supplies should be explored and smaller scale units developed and implemented as appropriate.

The third tier will be the development of a regional electricity supply grid that employs larger scale generation and transmission into play to supply the growing electricity demands within the region.

Organizing the Electric Systems

The organizational approach for each tier will be based on an appropriate co-op, community ownership model. The initial step will be to establish community level energy-service organizations (i.e. co-ops, associations, membership corps., etc). These will implement the first tier programs under close coordination and guidance from rural energy experts such as NRECA.

The initial operating organization will be a local co-op NGO supported by NRECA. This co-op will operate the facilities with understanding that it will be incorporated (in some fashion) into a larger scale cooperative organization once established. This will allow for the greatest latitude in initial operation service will maintaining the flexibility for long-term expansion and growth.

The second and third tiers organizational approaches will build and expand on these. The second tier developing regional level NGOs (co-ops) made up of clusters of community level organizations to provide the scale necessary to effectively manage and operate the dispersed systems.

The third tier organizational approach will take much longer to implement will include assisting the New Sudan authorities in developing a broad-based approach to electricity that allows organizational diversity to meet the growing energy needs within the country and that provides access to the greatest number of people in New Sudan. This effort includes policy guidelines, legislative language development, and the establishment of various oversight groups and agencies. Due to the level of complexity and multi-sector involvement, these issues must be addressed at the earliest possible opportunity.

Preliminary Task Required

A series of action plans will need to be developed for each stage of the electricity process.

1. Initial Action plan.
    - The focus of the initial electrification efforts will to begin the transition from emergency response toward development with a primary goal of developing a single electric energy platform.
    - The plan should identify and serve critical loads and sites such as hospitals, food distribution centers, and staging areas.

- Interim actions should address providing electricity to local commercial entities to help reestablish community viability, and to the provisions of street and public night lighting to increase safety and to promote feelings of peace and security.
- The plan should identify the activities necessary to begin a comprehensive and effective approach to the provision of electric service.
- This implementation period should be kept to a minimum, as this will be the most costly part of the electrification process. During this initial period operational funding will depend heavily on outside sources.
- It should be noted that much, if not most of the equipment and materials utilized during this period would be completely expended. Few actions during this phase will lead to long-term solutions if left unmodified.

2. Phase-two action plan and interim actions
   - Interim actions continues to transition away from emergency response and moves progressively toward long-term solutions.
   - This should include an action plan that modifies the emergency response activities and consolidates these isolated activities in a increasingly comprehensive response approach.
   - Target outputs of the plan usually include addressing the increasing generation demands, growing equipment and material logistics problems, and initiating training, capacity building, and technology transfer. To empower the local communities to take over the long operations of the electric systems.
   - The interim period should be planned with a definite life cycle that leads as quickly as possible to the implementation of long-term responses.

3. Long-term response and planning.
   a. The long-term responses should be considered from the start, however, long-term solutions do not effectively respond to local needs during either the emergency response or the interim periods.
   b. A long-range action plan should be a critical output of the interim period activities. This plan should lay the groundwork for continuing rehabilitation, provide a roadmap for expansion, and lay the legislative groundwork for sustainable electrification.
   c. A country level master plan is often one of the outputs of the long-range plan.

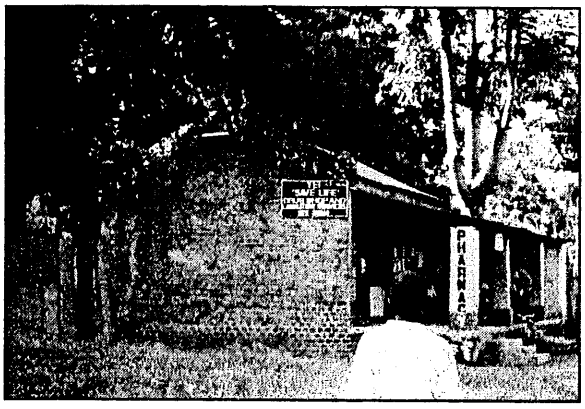
The technical details of the mission are new being evaluated, including the existing level of energy expenditures for each community, the cost of diesel delivered to each community, potential productive uses of electricity that can be encouraged, and the level of training that will be required for each of the operating personnel.

Also Needed for Success

The approach to electrification in Sudan must focus substantially on training. The 40 years of almost continuous conflict as left a large a society devoid of basic education. This means tat any successful approach must include a significant level of training for every position and trade including - technical training of operators and technicians and electricians, and professional development of office, bookkeeping, and management staff personnel.

The approach to electrification must also include a major economic development effort. At a minimum, this effort should provide the introduction of productive uses of electricity, and the empowering of small-cottage industries throughout the region. Small business development must be a primary concern. The development of a strong agribusiness and commercial enterprise sector is the only means of bringing

much needed capital into the society and providing the long-term economic sustainability required for success of the electric sector and society itself.



Existing local business using electricity from a small generator