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LIBERIA ENERGY ASSISTANCE PROGRAM (LEAP)
FINAL REPORT

FEBRUARY 28, 2009

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ACRONYMS

COTR	Contracting Officer's Technical Representative
CSET	Center for Sustainable Energy Technology
EPP	Emergency Power Project
ESG	Energy and Security Group
GOL	Government of Liberia
IRG	International Resources Group
LEAP	Liberia Energy Assistance Program
LEC	Liberia Electricity Corporation
MLME	Ministry of Lands, Mines & Energy
MOH	Ministry of Health
MPW	Ministry of Public Works
MW	MegaWatt
NEP	National Energy Policy
NGO	Non-Governmental Organization
PV	Photovoltaic
RESCO	Rural Energy Service Company
RREA	Rural and Renewable Energy Agency
SIMS	System InforMation Services
SL	Solar Lanterns
SPS	Solar Power Systems
SR	Solar Refrigerators
SSL	Solar Streetlights
STI	Solar Technology Inc.
T&D	Transmission and Distribution
USAID	US Agency for International Development
USG	United States Government
WB	World Bank

EXECUTIVE SUMMARY

This report covers the twenty-eight calendar months of the USAID-funded Liberia Energy Assistance Program (LEAP) implemented by International Resources Group (IRG). Awarded on October 3, 2006, the LEAP contract included provision for two option years, one of which was exercised. The contract terminated on March 1, 2009. Under LEAP, IRG and its partners provided technical assistance in the areas of energy policy, institutional strengthening, rural energy development, and prepaid metering pilot projects in two peri-urban areas of Liberia's capital, Monrovia. Procurement completed under the project included equipment for the transmission and distribution system build out in Monrovia, customer connections equipment for new customers of the Liberia Electricity Corporation (LEC), solar photovoltaic (PV) systems for rural pilot projects, and a prepaid metering system for pilot project customers. The final contract value totaled $10,941,522; $4.5 million of the budget was dedicated to procurement of customer connections equipment, goods for the buildout of the transmission and distribution system in Monrovia, and equipment for the pilot projects. See Section 1 for a summary of modifications to the contract and spending by line items.

PROJECT TEAM

LEAP was a rigorous and ambitious program implemented in a challenging political and operational environment, particularly at inception in 2006. From October 2006 through March 2008, Fredrick Whitaker served as Chief of Party of both the Emergency Power Project (EPP) and LEAP; Margaret McKay served as Home Office Task Order Manager for both projects. Thus the synergies between the two USAID-funded and IRG-implemented projects were leveraged and both technical and cost efficiencies were captured.

During the final ten months of the contract, LEAP was led by Simbarashe Mangwengwende, Private Power Producer Specialist. Mr. Mangwengwende was selected on the basis of his more than 27 years experience in electrical engineering, sector reform, rural electrification and utility management, including more than 12 years as Chief Executive of Zimbabwe Electricity Supply Authority (ZESA). He brought particular expertise in power distribution engineering and reform, power system design and operations, utility performance improvement, and corporate management. After conducting a short TDY assignment in February 2008, Mr. Mangwengwende joined the project full-time in March of 2008 and brought the project to a close in late February 2009. During this period, he oversaw the finalization of the National Energy Policy, working on a weekly basis with the Assistant Minister, MLME, as well as with the President's Senior Energy Advisor and relevant international experts. At the same time, he directed the work of the US and Liberian attorneys drafting the Liberian Energy Law of 2009, ensuring its adherence to the intent of the National Energy Policy. Drawing upon his experience leading ZESA in Zimbabwe, Mr. Mangwengwende oversaw the capacity building for the prototype Rural and Renewable Energy Agency (RREA) and Rural Energy Fund (REFUND) using staff from Center for Sustainable Energy Technology (CSET) in supporting the Ministry of Lands, Mines and Energy (MLME) in developing the necessary operational plan, organization structure and operating guidelines. This proved to be an effective strategy supported by the President and which facilitated the handover of the LEAP solar pilot demonstration projects to the Government of Liberia. Mr. Mangwengwende also oversaw the implementation of the peri-urban and rural pilot projects, including having to change sites for part of the project and wrangling with problematic suppliers of both the metering and solar systems.

It is only through the development and leveraging of local expertise that IRG was able to successfully achieve the objectives of LEAP. The development of local Liberian expertise in LEAP has been extraordinary. Community coordination for the pre-paid meter pilot projects as well as evaluation of the impacts of those pilots was managed by Center for Sustainable Energy Technology (CSET). CSET's significant knowledge and experience in rural energy also resulted in its staff's selection to serve as the prototype RREA. Liberian subcontractor Solar Technology, Inc. (STI) completed solar installations at over 40 different locations around the country, in twelve of Liberia's counties. In the preparation of the National Energy Law in the final months of the project, Monrovia attorney Alfred Brownell played an essential role, ensuring the compatibility of the draft law with Liberia's legal framework. Also notable is the contribution of Ivan Sims and his colleagues from System InforMation Services (SIMS), who operate the accounting and information technology services of LEC, and provided essential support to the prepaid metering effort under LEAP.

IRG drew upon a small set of trusted international experts who performed repeat assignments to oversee ongoing programs, thus ensuring synergies across activities as the same set of experts continued to collaborate and communicate whether in the US or in Liberia, as policy development and pilot project activities progressed. International experts supplemented the considerable Liberian technical assistance in LEAP in the areas of energy policy formulation (IRG staff including Charles Ebinger, Margaret McKay, Tom Wheelock), renewable energy development (ESG staff Judy Siegel and Kristin Stroup, ESG consultants Matthew Brown and Perla Manapol along with IRG staff Matthew Mendis), energy law (IRG consultant Ashley Brown), private investment promotion (IRG staff members Whitaker and Wheelock, along with IRG consultant Robert Chronowski) and peri-urban electrification (IRG subcontractor Smyser Associates and IRG consultant Richard Pearce). International subject matter experts directed the efforts of Liberian experts and mentored them to help update and expand their skills. This cadre of experts promoted efficiencies in implementation as well, as they continued to build and share knowledge and experience on the Liberia energy sector and the progress of its development.

LEVERAGING OF LEAP

The LEAP team successfully pursued complementary funding for its activities from a variety of funding sources. CSET and STI were awarded a World Bank grant through the Lighting Africa Development Marketplace Competition. This proposal was one of sixteen winners of a $200,000 grant in the competition. IRG subcontractor Energy and Security Group (ESG), a small, woman-owned US business, and CSET submitted a proposal to the Renewable Energy and Energy Efficiency Partnership (REEEP) for institutional development and capacity building of the Prototype RREA which was pending at project close. With IRG support, CSET has also been awarded a grant of $35,000 from the US-based Daphne Foundation to conduct research on renewable energy in Liberia and identify potential entrepreneurs in rural Liberia to develop renewable energy businesses; the follow-on grant to implement the program has a value of $400,000. LEAP experts played a key role in getting GEF approval of $2 million for mini-hydro projects, along with $75,000 from the Liberian private sector for a coconut mini-oil mill pilot project that is also supported by another USAID program, LCIP. The IRG Team continues to seek opportunities to leverage funds from the World Bank, GEF and other public and private funding sources to advance rural and renewable energy, microenterprises development and related project activities.

POLICY DEVELOPMENT

IRG organized the first ever National Energy Forum in October, 2006, which was attended by over 200 central and rural government delegates. This two-day forum allowed President Sirleaf, Minister Shannon of the Ministry of Lands, Mines and Energy (MLME), Senior Energy Advisor to President Sirleaf Chris Neyor, and LEC representatives to express their energy policy visions, and for citizens, especially from rural areas, to discuss their views on key energy issues. From the published output of this Forum, and with extensive internal governmental discussion, IRG produced the 70-page Energy Policy White Paper. This White Paper was so comprehensive and concurred upon that GOL distributed it to international donor organizations at the Donor's Conference in February of 2007, as their official "way forward".

Energy policy development continued throughout the LEAP project period. Working with the President's Senior Energy Advisor, and the Assistant Minister of MLME, the LEAP team developed Liberia's first comprehensive National Energy Policy (NEP). The NEP was vetted at three public Validation Workshops in the summer of 2008. Two of these were held in rural areas and one in Monrovia, with a total of almost 400 attendees. The final draft of the NEP has been reviewed by the Governance Commission and is under final consideration by Minister Shannon; Cabinet adoption of the NEP is anticipated later this year. MLME is considering using this same methodology to gain national consensus for a Land Use Policy and a Mining Policy.

IRG US and Liberian legal experts drafted the Liberian Energy Law of 2009, to implement the reforms comprising the NEP (excluding those related to the petroleum sector). Key provisions of the law include:

1. Creation of the Rural and Renewable Energy Agency (RREA);
2. Establishment of the Department of Energy in the MLME;
3. Establishment of the Renewable Energy Fund (REFUND); and
4. Repeal of the Acts creating the Liberia Electricity Corporation, Liberia Petroleum and Refining Corporation and the National Oil Company of Liberia (NOCAL) and creation of successor organizations.

One critical and timely element of the National Energy Policy is the establishment of a Rural Renewable Energy Agency, the first of its kind in Liberia. In order not to lose the experience of current solar and biomass energy installations, President Sirleaf signed a charter letter for the prototype RREA (see Annex 1). The MLME endorsed IRG's plan as well, and the prototype has been staffed with personnel from CSET.

RURAL ENERGY PROGRAM

IRG implemented rural energy pilot projects to demonstrate mechanisms to improve the availability of energy services to Liberia's rural citizens. Activities comprised the supply and installation of various types of solar – powered systems to clinics, schools, non-governmental organizations (NGOs), small businesses, and community facilities in a number of rural towns and villages. These solar systems included solar power systems (SPS), solar refrigerators (SR), solar streetlights (SSL), and solar lanterns (SL).

> The pilot solar power projects funded (by) USAID and implemented through the Liberia Energy Assistance Program (LEAP) has already covered Bong, Grand Cape Mount, Grand Gedeh, Lofa, Nimba, Sinoe, and Rivercess counties with various solar technologies at clinics, schools, community centers, small businesses, and for street lights. With the recorded satisfactory success of the pilot projects, we will now move along quickly to complete the remaining pilots in other counties and launch full scale implementation around the country.
>
> *—President Ellen Johnson Sirleaf,*
>
> *Annual message to the 4th session of the 52nd national legislature of the Republic of Liberia*

The selection of project sites was based on the need to integrate energy services into existing USAID-sponsored projects and/or to test the commercial and technical viability of different systems, sizes, and applications. Several other sites were selected based on direct requests from the GOL as part of its strategy to electrify rural clinics and schools across Liberia. By the end of LEPA, 20,000 Liberians were benefitting from solar power systems, solar street lights, and solar lanterns, with a total capacity of 24.51 kW, installed at sites in 12 counties.

The willingness to pay is a key indicator of the suitability of solar technology as it relates to affordability. Though the initial cost of US$ 7,000 for a 500W solar power system is very high, the owners of private businesses benefitting from these systems advised the pilot evaluation team of their willingness to pay for these systems. Interestingly, administrators at the schools covered by the program evaluation survey – Sanniquellie and Zwedru High Schools – also indicated a willingness to pay. These participants also requested larger SPS and suggested payments of $20 - $50 per month. However, the administrators of all of the clinics informed the evaluator of their inability to pay for the solar refrigerators.

To inform potential investors in renewable energy in Liberia, the National Renewable Energy Laboratory (NREL) was contracted to conduct a Biomass Energy Assessment, completed in February 2009. While necessarily high level owing to budget limitations, the assessment provides a clear overview of key biomass resources. A more detailed examination is required of the potential for energy production including the practically sustainable quantities for biofuels and power production.

Absent a detailed assessment of renewable resources, the GOL was approached by a private consortium interested in developing a biomass-fired power plant near Monrovia. IRG experts in biomass-fueled power plants, project development, and transaction support assisted the GOL in evaluating the opportunity, proposed terms of the project agreement, and technical aspects of the 34 MW rubber tree chip-fired plant. The Concession Agreement between the GOL and Buchanan Renewable Energies (BRE) and the Power Purchase Agreement were signed in January 2009.

URBAN PILOT PROJECTS

LEAP incorporated the implementation of urban pilot projects in two areas of Monrovia. Complementing the metering, billing and collection program of the LEC, these pilots demonstrated the potential for prepaid metering to improve revenue collection efficiency and to reduce non-technical losses. Low income communities in Bushrod Island and Wrototown were surveyed by CSET and customers were selected for implementation of prepaid metering systems. LEC staff was trained in the use of the prepaid metering software, and vendors in each of the pilot neighborhoods were selected to sell cards modeled on the cell phone prepaid cards currently in use in Liberia. The vendors make bulk purchases from the utility at a discount and resell to the end-users at the regulated rates. A businesswoman was selected as the vendor for the first pilot area and a retired engineer for the second pilot area.

Based on the results of the evaluation of the two pilot projects, it was demonstrated that prepayment for electricity eliminates problem of arrears, helps to prevent electricity theft, and reduces operating costs of LEC. It also showed customer ability to control electricity costs and satisfaction with prepayment system, community satisfaction with benefits of street lighting, and usefulness of the community-based vendors to improving LEC operations.

Upon completion of six months of usage in the Bushrod Island community, the EPP Team will develop a road map for residential service including technical and financial approaches for electrification of sub-standard residential structures.

PROJECT METRICS

LEAP was highly successful in meeting its performance objectives in policy development as well as pilot project implementation. More than $3 million in supplemental funding for rural and renewable energy projects was leveraged. Transaction support was provided to the BRE-sponsored 34 MW biomass plant.

Working with GOL counterparts including the Minister and Assistant Minister of the Ministry of Lands, Mines and Energy and the Senior Energy Advisor to President Sirleaf, we achieved:

1. Development, vetting and finalization of the National Energy Policy;
2. Drafting of the Liberian Energy Law of 2009; and
3. Improvement in energy sector governance and strengthening of energy sector institutions.

As of project close out, metrics for the urban and rural pilots neared 100% of targets in most categories.

Pilot	Metric	Total to Date	Target	% Achieved
Urban	Customers	230	230	100.0%
Urban	Beneficiaries	8700	20000	43.5%
Rural	Customers	80	83	96.4%
Rural	Beneficiaries	18750	20000	93.8%
Rural	kW	22.35	24.51	91.2%

The number of beneficiaries of the urban pilots will reach target levels when electricity service to all pilot areas in Bushrod Island is achieved.

SECTION 1 CONTRACTUAL REPORTING

Over the 28 months of the LEAP contract, IRG has worked with a number of COTRs and COs, including COs from the Regional Contracting Office in Accra. Upon award, Mission Director Wilbur Thomas and William Massaquoi were assigned COTR responsibility, while Ken Stein, RCO/Accra provided contractual oversight. At the time of project close-out, Anthony Carvalho served as COTR while Brian Aaron had CO responsibility for LEAP. Other COTRs included Modupe Broderick and McDonald Homer of the Monrovia Mission; interim CO responsibility was held by Lawrence Bogus.

Exhibit 1 summarizes contract modifications over the project period, while Exhibit 2 provides spending by line item was of March 2009.

Exhibit 1: Summary of Contract Modifications

Modification Number	Date	Extension until	Increase Value to	Obligation of funds and other terms
1	September 30, 2006	November 15, 2007 for base	$14,459,094	Added Task 6, Procurement for EPPII MOU
2	October 18, 2007			Increased obligated funds to $6,598,060
3	November 14, 2007	December 31, 2007 for base		Increased obligated funds to $6,980,060
4	December 27, 2007	Exercised Option Year 1		Increased obligated funds to $8,236,060
5	March 28, 2008			Increased obligated funds to $9,236,060
6	May 1, 2008			Realigned budget
7	July 16, 2008			Increased obligated funds to $10,481,060
8	December 2, 2008	March 1, 2009		Increased obligated funds to $10,941,522

Exhibit 2. Use of Project Funds by Budget Line Item

(Invoiced as of March 27, 2009)

Salaries	$878,204.30
Travel	$433,577.28
Consultants	$244,534.95
Allowances	$ 421,698.23
Other Direct Costs	$ 1,787,763.37
Subcontractors	$ 1,521,750.05
Equipment	$ 2,903,864.27
Technical TCN/CCN Labor	$9,255.50
Overhead	$ 371,012.99
Subcontractor Handling	$ 60,867.21
General and Administrative	$ 1,727,228.16
Fee	$ 535,421.34
Total	$ 10,895,107.64

SECTION 2. PROJECT ACTIVITIES

Key accomplishments for a program such as LEAP are determined by three factors – knowledge of what needs to be done to sustain program objectives; availability of people committed to program objectives; and availability of resources to accomplish what needs to be done. On this basis the following are the key achievements for LEAP:

1. **Policy clarity**: LEAP had a two-fold goal – (1) to increase access to affordable and reliable energy supplies in order to foster economic, political, and social development in Liberia; and (2) to support transparent policy reform processes and energy sector regulatory regimes. An estimated 20,000 people in rural areas and a similar number in urban areas have benefitted directly or indirectly from electricity services provided through LEAP and the government now has a clear policy and legal framework that provides a road map for sustainable development and management of the country's energy sector.

2. **Institutional framework to sustain LEAP and other rural energy activities**: The sustainability of LEAP activities was given priority consideration. In the absence of an existing institutional framework within the utility and the government, we recommended and obtained the approval of the President of Liberia to create a prototype RREA. From the GOL's fiscal year 2009/2010 there will be an operating budget for the prototype RREA. In the interim the GOL is using CSET, a LEAP-funded NGO, as the prototype RREA. The USG and GOL have signed an MOU that provides for the prototype RREA to take over, sustain and roll out all LEAP rural energy activities. In so doing the prototype will assist the GOL in building capacity for the official RREA which is to be established by the Liberian Energy Law of 2009. The prototype will also support various types of Rural Energy Service Companies (RESCOs), starting with those being used to sustain LEAP demonstration projects.

3. **Financial facilitation for renewable energy services**: Through LEAP-supported initiatives a number of complementary financial resources for renewable energy activities have been made available to the country - $200,000 through the Lighting Africa Development Marketplace project won by the Liberian LEAP team of the Center for Sustainable Energy Technology (CSET) and Solar Technology Inc. (STI) (LEAP contributed an additional $47,000 for this project); the designated principal officer of the prototype RREA played a key role is getting GEF approval of $2 million for mini-hydro projects; $70,000 obtained for renewable energy studies through the Daphne Foundation (these studies will lead to project funding of at least $400,000); $75,000 from local private sector for a coconut mini-oil mill pilot project that is also supported by another USAID program, LCIP; several contracts have been signed, or are in the process of being negotiated, with beneficiaries of the solar pilot projects for the prototype RREA to collect money to pay for the operation and maintenance of the installed equipment.

TASK 1: BUILD UPON THE EMERGENCY POWER PROGRAM (EPP) REPORTING, ACHIEVEMENT AND OTHER SUPPORT.

The objectives of Task 1 were effective coordination between EPP and LEAP projects and leveraging of their respective resources and activities. The designated performance indicator is "number of people with increased access to modern energy services".

IMPLEMENTATION STATUS

LEAP has successfully built upon EPP to achieve its two-fold goal – (1) to increase access to affordable and reliable energy supplies in order to foster economic, political and social development in Liberia; and (2) to support transparent policy reform processes and energy sector regulatory regimes. LEAP has increased electricity access through EPP by contributing financial resources for increasing customer connections to match increased EPP investments in power generation. LEAP has used EPP to support pilot projects designed to generate lessons for policy development.

The LEAP budget also funded $4.5 million for procurement of T&D equipment and customer connection materials. The actual labor associated with procurement and installation activity was provided by EPP. The prepayment meter pilot in Monrovia complemented the metering, billing and collection program of LEC, helping to improve revenue collection efficiency and to reduce non-technical losses.

By March 2009, the Liberia Electricity Corporation (LEC) had more than 1,000 customers and enough materials to connect up to 2500 customers. Two pre-payment meter pilot projects had been launched on the back of EPP projects in Congo Town and Bushrod Island (nearly 300 meters installed with 28 pre-payment customers energized in Wroto Town community and 72 pre-payment customers energized in New Krutown and Point-Four communities in Bushrod). All the meters were scheduled to be energized upon completion of the EPP projects for resolving generator loading constraints.

The Government of Liberia has been evaluating several medium term generation options designed to build upon and sustain the electrification program initiated under EPP. LEAP has provided professional advice and support to the Government of Liberia in evaluating the power generation option based on rubber wood proposed by the Buchanan Renewable Power.

TASK 2: ENERGY SECTOR REFORM

The expected results from this task were:

1. A formalized statement of national energy policies;
2. Announcement of clear and modern energy policies that are intended to benefit the entire population of Liberia;
3. Opening of the electricity sector to private investment; and
4. Restructuring of LEC to achieve efficiency and operational improvements with a view to possible privatization.

PERFORMANCE INDICATORS

Measures of success under LEAP were:

1. Publication of a National Energy Policy (NEP) document that includes strategies and projected cost of implementation;

2. The drafting of legislation (an Electricity Law and a Rural and Renewable Energy Law) and submission to GOL; and

3. Improvement in energy sector governance and strengthening of energy sector institutions.

IMPLEMENTATION STATUS

The original plan was to develop an energy policy document by the end of 2007, followed by drafting and enactment of a new electricity and rural and renewable energy law by the end of 2008. Depending on progress and additional funding, it was also expected that assistance would be given in implementing the new policies and legislation with respect to the creation of an energy regulatory board and a rural and renewable energy agency, as well as restructuring of the MLME and LEC. The original plan had to be adjusted as Government of Liberia feedback was consistently delayed, with these delays resulting in the associated delays in project implementation. Notwithstanding these changes to plan, by the end of December 2008 the main result expected from this activity, namely clarity of policy, had been achieved.

Consequently the Liberian Energy Law of 2009 was prepared. The law includes provisions for dissolution of the Liberia Electricity Corporation and other energy parastatals. The Liberian Energy Law of 2009 gives legal force to the main principles of the NEP, including creation of the Energy Regulatory Board, a Rural and Renewable Energy Agency, and a Rural Energy Fund, as well as a restructured MLME and LEC. The law also provides for a future section on the petroleum sector to be prepared under another USAID mechanism.

REASONS FOR PERFORMANCE VARIANCES

1. Delays in getting feedback from the Government of Liberia – An energy White Paper was produced and published in February 2007 and a draft energy policy document was prepared by the end of 2007 and presented to the Government of Liberia for feedback during the first quarter of 2008. Based on preliminary feedback from senior policy makers, a revised draft policy document was produced in March 2008. Following further vetting at three policy validation workshops held in July and August, 2008 which were attended by stakeholders from all 15 counties of Liberia, a draft final policy document was published in September 2008 and presented to Cabinet for approval before formal publication. At the close of LEAP, Cabinet approval was still pending. At the same time, LEAP prepared legislation to facilitate the implementation of the energy policy, based on international best practice and in compliance with Liberian law and practice.

2. Sequential nature of the task – The milestones in this task are dependent upon accomplishment of earlier activities; hence the activities could only be completed in series rather than in parallel. For example, the NEP could not be published until formally approved, projects and programs for implementation of policies and laws could not be implemented before NEP's adoption and the Law's enactment.

TASK 3: URBAN COMMUNITY DEVELOPMENT PILOT

Task 3 objectives were defined as follows:

1. Sustainable electrification of two low income communities;

2. Evaluation and dissemination of results of pilots (expected to demonstrate that prepayment for electricity eliminates problem of arrears, helps to prevent electricity theft, and reduces operating costs of LEC); and

3. Provision of a road map for residential service, including technical and financial approaches for electrification of sub-standard residential structures.

PERFORMANCE INDICATORS

1. Number of structures electrified in the pilot area(s);
2. Customer ability to control electricity costs and satisfaction with prepayment system;
3. Community satisfaction with benefits of street lighting and increased security;
4. Compatibility with and usefulness to improving LEC operations (as demonstrated by integration of lessons from pilot into development of sustainable service model for LEC residential service and expansion of prepaid meters installation in other Monrovia communities);
5. Reduction of arrears to LEC;
6. Reduction of non-technical losses, operating budget of LEC; and
7. Inclusion of more low income customers with substandard houses in electrification program.

IMPLEMENTATION STATUS

The original plan was to install, by the end of the base year (10/06-10/07), 200 single-phase and 5 three-phase split prepayment meters (where a meter interface unit is installed on the power line pole and a customer interface unit is installed within the customer's premises) and to install an additional 500 by the end of the option year (10/07-10/08). The base year project was to connect meters in two pilot areas in Monrovia - Wroto Town and GSA Road, Paynesville. The plan for the option year was to roll out the pilot to other communities, based on lessons learnt from the base year. When the supplier encountered unexpected design problems with the split meter, the order was subsequently amended to 140 integrated meters to be delivered ahead of 100 split meters to be delivered when the design problems were resolved. The integrated meters were delivered in March 2008 and the split meters were delivered at the end of September 2008.

By the end of February 2009 there were 230 meters installed (128 in Wroto Town and 102 in Bushrod Island) and 100 meters energized (28 in Wroto Town and 72 in Bushrod Island). Each community is served by a vendor – a businesswoman in Wroto Town and a retired engineer in Bushrod Island. Due to generator loading constraints, only the 28 meters in Wroto Town were continuously energized. The Bushrod Island vendor has only had limited opportunities to sell during test runs of the generator.

However, although the lessons learnt are based on this limited sample, they are sufficient to provide firm conclusions and recommendations. The pilot has demonstrated that the 230 prepayment meters are an effective revenue collection strategy for LEC and need to be maintained. A detailed roll out plan will require more operational experience with both types of meters in order to determine which type to adopt for the different customers and applications. Upon completion of six months of usage in the Bushrod Island community, the EPP Team will develop a road map for residential service including technical and financial approaches for electrification of sub-standard residential structures.

REASONS FOR PERFORMANCE VARIANCES:

1. Poor delivery performance by the supplier, ACTARIS of South Africa – This resulted in a revised plan to install 140 integrated pre-payment meters (135 single-phase and 5 three-phase) and 100 split meters in Wroto Town and Bushrod Island. Although the supplier received the original order in July 2007 with a three-month delivery schedule, the 140 integrated meters were only delivered on March 18, 2008 and 100 split meters on September 29, 2008.
2. Re-allocation of the budget towards customer connection materials - This was necessary to ensure that LEC had sufficient customer connection materials to complement the additional 7MW generation funded by Norway under the Emergency Power Program.

3. Delays in getting GSA Road available for project implementation - GSA Road pilot project area required transformers and other materials expected under a delayed Norwegian-funded T&D project. Further, many of the original structures identified for electrification in the GSA Road community were later zoned for demolition by the Ministry of Public Works (MPW). The zoning and demolition work is not expected to be completed until the end of 2009. Therefore even if the T&D materials had been available on time, without completion of the zoning work it would not have been possible to draw up a new customer list and hence design and build the necessary new MV and LV network. Consequently, IRG solicited and received USAID approval to shift the second urban pilot site to Bushrod Island.

4. LEC institutional capacity constraints – The limited number of energized meters is partly due to LEC's poor planning and customer service management. Although LEC imposed a moratorium on new connections in Wroto Town, this did not stop them from connecting more than 40 customers using conventional meters when pre-payment meters could have been installed. The Bushrod generator is not yet on commercial load because of very slow customer connection rates. By the end of December 2008 there were still only 109 customers connected (57 of them pre-payment) representing less than 10% loading on the generator.

TASK 4: IMPROVED RURAL ENERGY SERVICES

The expected results for the rural energy services activities were:

- Pilot innovative business models and public-private partnerships with businesses, entrepreneurs, and NGOs, thus increasing access to modern energy services as a means of enhancing economic and social development;
- Assess of biomass resources available in Liberia;
- Conduct feasibility study of utilizing select resources (e.g. rubber wood) for energy or productive uses in Liberia;
- Enhance public understanding and participation in the provision of energy services;
- Pilot innovative financing approaches for modern energy services;
- Leverage USAID funding for increasing support for LEAP-related rural energy activities in Liberia from other public-private sector sources;
- Support long-term strategy for Ministry of Health modernization of rural healthcare, procurement of equipment for multiple clinics in rural areas, electrification of up to 400 rural clinics; and
- Document improvements in people's lives and livelihoods via modern energy services and effectiveness and efficiency in use of USAID resources.

PERFORMANCE INDICATORS AND TARGETS

- Over 100 youth benefitting from modern energy and associated health benefits;
- Over 500 residents benefitting from improved social services (clinics, prisons, street lights);
- Over 20 people trained in business management systems related to owning and operating a RESCO, over 20 new jobs created from RESCO, over 5 energy enterprises with improved business operations;
- Over 25 SMEs with access to modern energy and improved and expanded operations;

- Over 10 community based agencies trained in benefits of improved energy services;
- Over 30 households (150 people) receiving household energy services;
- Improved incomes from longer operating hours leading to higher profits and more efficient business operation for local enterprises;
- Reduced gender-based violence as community lighting helps to keep people safe on the street at night;
- Over 50 policy makers trained in local organizational capacity development;
- 3 to 5 funding sources identified to support LEAP rural energy activities;
- Over US$500,000 raised in incremental funding commitments to support LEAP rural energy activities;
- Assisting the MOH to devise a careful strategy for electrification of up to 400 rural clinics, benefiting the surrounding population (more than 1000) for each of the facilities; and
- Report to USAID on lessons learned, best practices and implications for LEAP year 3 and beyond.

IMPLEMENTATION STATUS

During the LEAP base year, the rural energy activities were focused on advancing the use of environmentally beneficial renewable energy resources while providing energy services to support other USAID Mission projects. During the option year, the focus shifted to developing sustainable models for delivery of rural energy services. This required a restructuring of the activities to (i) establishing a prototype RREA as the institutional framework for building upon and sustaining LEAP rural energy activities, and (ii) implementing the Task 4 activities as a capacity building exercise for the prototype RREA.

An NGO, CSET, was subcontracted in April 2008 to assist with the establishment of the prototype RREA. Formal GOL approval to establish the prototype was granted by letter from President Sirleaf dated May 21, 2008 (see Annex 1) and the MLME formally launched the prototype on July 9th, 2008. The GOL also designated the Executive Director of CSET as the principal officer of the prototype RREA.

The prototype RREA, supported by IRG and subcontractors Energy and Security Group and Solar Technology Inc., accomplished the following:

- Provided support to the MLME for all work required to establish the official RREA (application to the President to establish prototype RREA, developing an organization structure and operational plan for the prototype RREA, finalizing the rural energy policy and strategy, and defining and developing the legislation and organization structure for the RREA including the associated Rural Energy Fund to facilitate funding of rural energy projects);
- Participated in the design and implementation of the LEAP pilot projects for the option year (identification of light, heat and power applications to meet the priority needs of the target beneficiaries, design of appropriate technological solutions to meet the needs, selection of beneficiaries, negotiation of contracts and establishment of a system for revenue collection, and assisting with installation as required by the contractor); Exhibit 3 below summarizes the installation as of February 28, 2009;

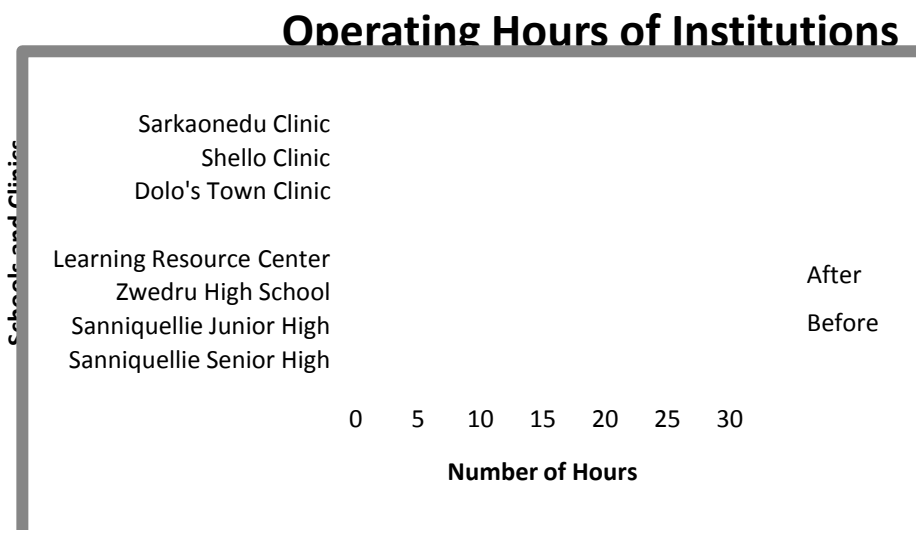
Exhibit 3. Listing of Installed and Planned Systems

Mission Support Project	Project Location	Type of Project	PV System Capacity
Try & See Wood Workshop	Sanniquellie	Private Business	260 Wp SPS & 2 SSL
ARS Guest House	Sanniquellie	Local NGO	520 Wp SPS & 2 SSL
Sanniquellie Central High	Sanniquellie	Public School	520 Wp SPS & 2 SSL
Sanniquellie Junior High	Sanniquellie	Public School	520 Wp SPS & 2 SSL
Cooper Pastry Shop	Greenville	Private Business	520 Wp SPS & 1 SSL
The Liberian Goldsmith Shop	Greenville	Private Business	520 Wp SPS & 1 SSL
Be Honest Fishery Shop	Greenville	Private Business	520 Wp SPS & 1 SSL
Cecilia Beauty Saloon	Greenville	Private Business	520 Wp SPS & 1 SSL
F. J. Grant Hospital	Greenville	Liberian Government	2 SSL
Zwedru Multilateral High	Zwedru	Liberian Government	4 SSL
Friendship Business Center	Zwedru	Private	520 Wp SPS & 1 SSL
Save The Children, UK	Zwedru	SCUK NGO	520 Wp SPS & 1 SSL
Liberia Agro Systems (LAS)	Zwedru	Local NGO	520 Wp SPS & 1 SSL
Dolo's Town Clinic	Margibi County	Liberian Government	1.30 kWp SPS
Learning Resource Center	Gbarnga	Liberian Government	1.30 kWp SPS
Shello Clinic	Lofa	Liberian Government	260Wp SR
Sakonnedu Clinic	Lofa	Liberian Government	260Wp SR
Robertsport	Grand Cape Mount	Liberian Government	10 SSL

- Provided support for the biomass assessment study, including identification of data sources and collection of data for submission to NREL; review of draft reports;
- Provided support for the establishment of a number of RESCO models, i.e., assisting in the study for replicating the Grameen Shakti (of Bangladesh) solar PV program in Liberia; in partnership with the private sector and LCIP, supporting an income generating coconut oil mill pilot project that is the nucleus of a biofuels project; supporting a project for the assembly and sale of solar LED lanterns by youth and women's groups; supporting pilot projects for the commercial delivery of solar lanterns using churches, SMEs youth and women's groups in several counties; undertaking research for scaling up the commercial delivery of solar PV systems beyond the pilot phases.
- Funding facilitation: supporting the MLME in the coordination of various donor initiatives as well as in applying for financial support for the Government's renewable energy efforts; developing the operating guidelines for the proposed Rural Energy Fund which will (1) provide grants for capacity building, e.g. to train private investors and communities to start and manage RESCOs, (2) provide subsidized project loans, and (3) provide loan guarantees, collateral to facilitate loans from commercial financial services institutions.

The impacts of the rural energy pilot projects have been diverse and significant for the rural beneficiaries. The improvements in the provision of social services as indicated by the significant increases in the number of beneficiaries of these services have been outstanding. The administrators of schools and clinics have reported that the increases were due to the ability to operate their institutions at night (See Exhibit 4).

Exhibit 4. Increase in Operating Hours of Clinics and Schools

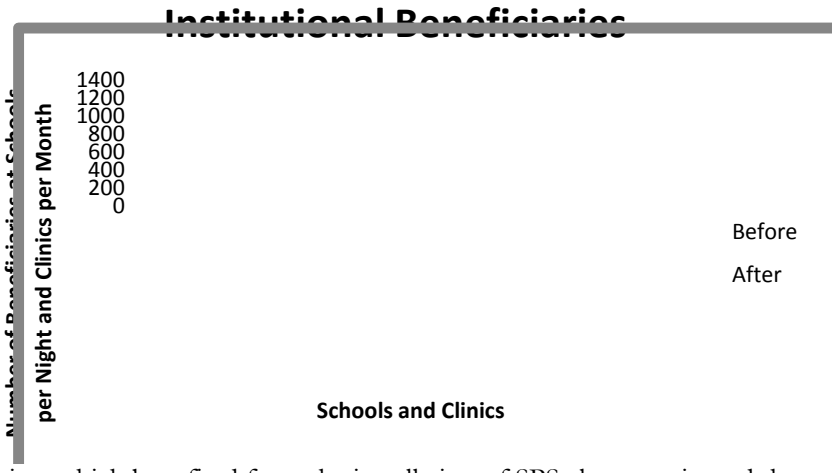


The heads of the three clinics visited reported substantial increases in the number of patients served. The Dolo Town Clinic, which has a 1.3 kW system, reported an increase of 80 percent due to the longer operating hours at night. According to the Officer in Charge (OIC) of the Dolo Town Clinic, the number of patients has increased from 500 to 900 per month. At the Shello Clinic, which received a solar refrigerator, the OIC indicated that they were vaccinating twice as many patients.

Schools experienced a huge rise in student enrollment since the installation of the systems. The availability of reliable electricity at night has encouraged many teachers and students to attend night classes. The principal of the Sanniquellie Central High School reported the enrollment of an estimated 150 new students – mainly females – in the night sessions. The increase in security due to the streetlights has been the main cause of the increase. The vice principal of Zwedru High School also noted an enrollment of about 125 students, which represents a 30 percent increase.

The impact of solar streetlights in the various communities cannot be overemphasized. In Robertsport, all respondents to the evaluation survey welcomed the presence of the streetlights. About 75 percent of those interviewed said that crime had been reduced by 30 to 50 percent by installation of the streetlights. However, the impact of the streetlights on business activities was not substantial because the lights were not installed in the commercial district. Still, 60 percent of the interviewees reported an average of 20 to 30 percent growth in businesses.

Exhibit 5. Increase in Beneficiaries in Schools and Clinics



Local private enterprises which benefited from the installation of SPS also experienced the positive socio-economic impact of the systems through improvements in the incomes of the owners. Of the six businesses evaluated, five reported huge increases in their incomes. The owners of these businesses reported an average of 75 percent increase in growth. The owner of the Try and See Business Center in Sanniquelle, Nimba County, reported a 50 percent increase in his income, though other residents in the area informed the evaluator that the business has actually grown threefold. The owners of these businesses reported that the longer operating hours at night were primarily responsible for the huge growth.

Exhibit 6 shows the increase in operating hours for some of these businesses after the installation of the solar systems. At the Liberia Goldsmith Shop and ARS Guesthouse sites, the evaluator observed that the absence of the original participants was responsible for non-availability of adequate and accurate data. Thus, for these institutions, information given in Chart 3 was incomplete.

Exhibit 6. Increase in Operating Hours of Businesses

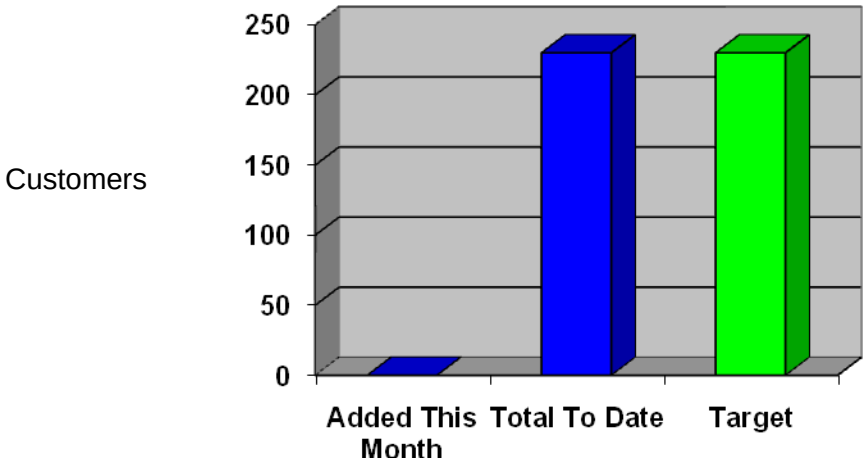
Additionally, despite the increase in growth at these institutions, the evaluator also noted that there was a decrease in the number of beneficiaries at these enterprises, due to the fact that they were no longer engaged in skills training. The skills training was discontinued when support provided by the USAID LCIP project was discontinued.

Nevertheless, as a result of the sharp improvements in their incomes, the owners of the five private businesses expressed a willingness to pay for the systems. This has highlighted the commercial viability of the systems. They have also expressed their need for larger systems – specifically the SPS – to meet the growth of their entities.

SECTION 3 PROJECT METRICS

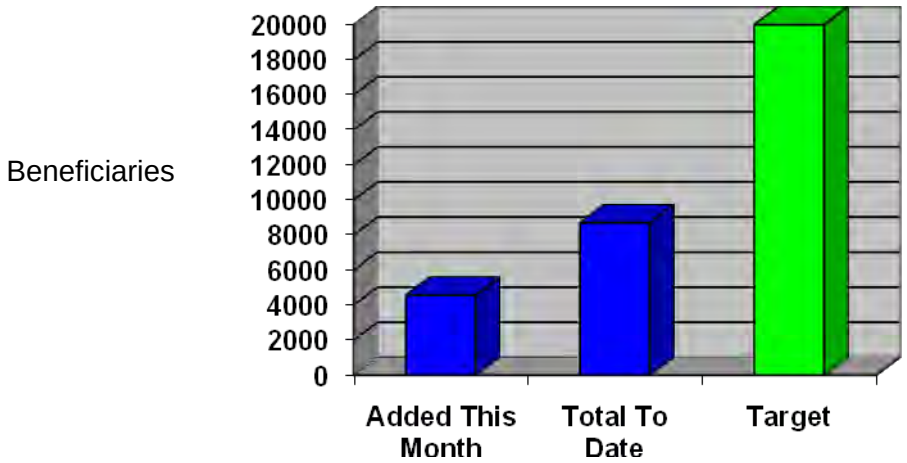
This section provides the key metrics that have been monitored and reported monthly to USAID, the GOL and other Liberian and international stakeholders. Both cumulative data and February 2009 monthly data are provided.

URBAN PILOT PROJECTS – CUSTOMERS (INDIVIDUALS AND INSTITUTIONS) CONNECTED



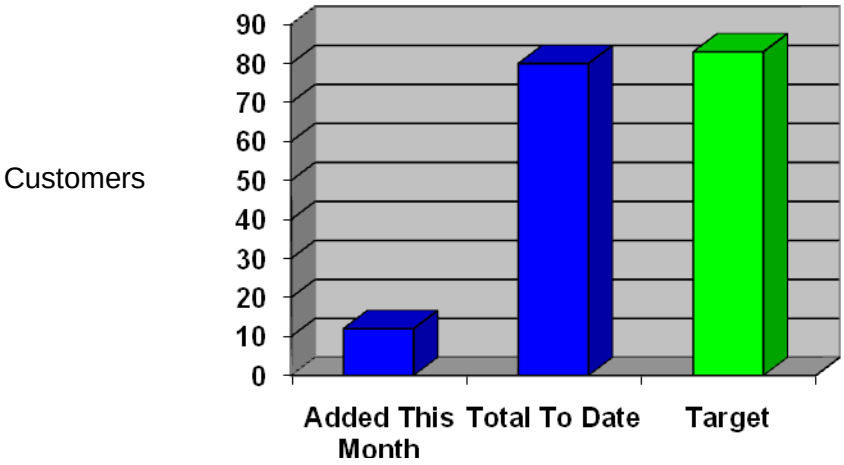
The number of urban pilot customers that can be energized is 230 (Wroto Town – approximately 128 and Bushrod – approximately 102). The number of meters that can be energized varies between 28 and 100 (Wroto Town 28, Bushrod 72) depending on test runs of the Bushrod Island generator. All meters will be energized once the EPP projects that are addressing the generation loading constraints have been completed.

URBAN PILOT PROJECTS – ESTIMATED BENEFICIARIES

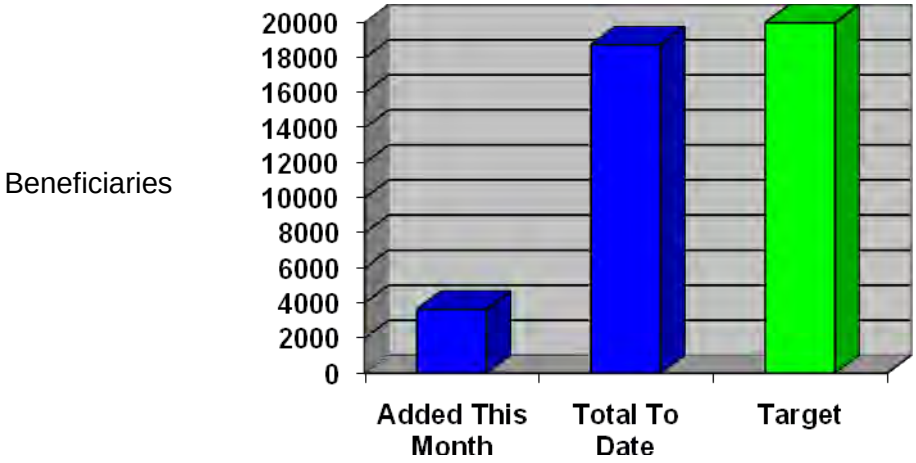


It is assumed that the electrification of the two pilot communities will benefit 20,000 people – the direct customers and the general public who have street lights and better services due to the availability of electricity in shops and community centers. The estimated beneficiaries to date are pro-rated based on the number of energized meters, which is 100 out of 230 or 43%.

RURAL PILOT PROJECTS – CUSTOMERS (HOUSEHOLDS, BUSINESSES, COMMUNITIES AND INSTITUTIONS) CONNECTED

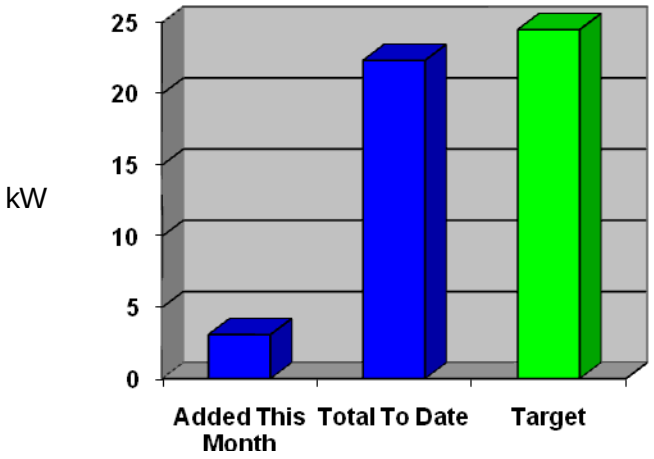


RURAL PILOT PROJECTS – ESTIMATED BENEFICIARIES



The estimated number of beneficiaries is partly based on 2008 census statistics for the various counties and also on the number of beneficiaries (such as students, patients, apprentices, etc.) who are provided with services from the various institutions. Figures have been rounded up for convenience. The 1250 number left to reach target relates to the three installations completed in March 2009.

RURAL PILOT KILOWATTS INSTALLED



The total installed capacity is 24.51 kWp.

SECTION 4 LESSONS LEARNED

TASK 1: BUILD UPON THE EMERGENCY POWER PROGRAM (EPP) REPORTING, ACHIEVEMENT AND OTHER SUPPORT

TASK 2: ENERGY SECTOR REFORM

Delays in getting feedback from the Government and its agencies were in part due to human and material resource constraints – many government departments are either short-staffed, or the staff need training.

TASK 3: URBAN COMMUNITY DEVELOPMENT PILOT

The main lessons learned from the urban pilot projects are based on a limited sample, but the experience is sufficient to provide firm conclusions and recommendations. The pilot has demonstrated that the 230 prepayment meters are an effective revenue collection strategy for LEC and need to be maintained. The two neighborhood vendors constitute two large creditworthy customers for LEC. Pre-payment meters have helped customers to control consumption and expenditure to suit their payment ability. None of the 27 Wroto Town customers (note that one customer has two meters, hence 28 meters in total for the 27 customers) have been disconnected in contrast to 71 out of 106 conventional customers in the same area who have been disconnected at least once for non-payment. A roll out plan for the prepaid metering program will be developed in the final months of the EPP project. By that time there should be sufficient operational experience with both types of meters in order to determine which type to adopt for the different customers and applications.

On a practical level, the need to build in significant oversight of suppliers was a significant lesson learned. In particular, the prepaid meter supplier, ACTARIS of South Africa, caused repeated delays in implementation as they consistent missed deadlines, failed to incorporate required implementation design details into their arrays, and attempted to accelerate payment prior to delivery and inspection of goods. With the global demand for prepaid meters growing, it is likely that the relatively small size of our procurement made it a low priority for ACTARIS. The technical performance of the integrated pre-payment meters has largely been satisfactory, which confirms the experience of other users of the same types of meters. Owing to the problems with ACTARIS's performance, it is necessary to identify alternative suppliers of integrated and split pre-payment meters similar to those installed in the pilot. There are other suppliers of these meters who should be able to provide better, faster and cheaper service.

Although USAID provided management support to reestablish LEC through the EPP Project, LEC retained sufficient autonomy to frustrate program activities. For example, although LEC imposed a moratorium on new connections in Wroto Town, this did not stop them from connecting more than 40 customers using conventional meters when pre-payment meters could have been installed. The Bushrod generator is not yet on commercial load because of very slow customer connection rates.

TASK 4: IMPROVED RURAL ENERGY SERVICES

Without an institutional framework it would have been difficult to plan for the sustainability of the activities under Task 4. The different activities and projects on their own have a very limited development impact in terms of increased energy access because of the small budget. However, as a capacity building exercise for the prototype RREA the impact has been significant, as the program established the local stakeholders' ability to take over and sustain the LEAP pilot projects and programs.

An evaluation of the solar pilot projects revealed that the solar power systems had an enormously beneficial socio-economic impact on the residents and participants wherever they were installed. Throughout the interviews, administrators and participants reported dramatic improvements in the delivery of social services at specific institutions since the installation of the systems. Small- and medium-sized private business which benefited from the project experienced significant growth in income over the past year, largely attributable to extended operating hours. In fact, these participants were unanimous in their request for larger systems and expressed their willingness to pay. The study established the suitability of the solar technologies as a strategy for the delivery of energy services to the rural population. The evaluation found no major technical difficulties in the operation and maintenance of the systems. Visual inspection of all the systems revealed no major technical defects. However, as some participants who were originally trained during installation had left these institutions, there is a need for periodic training for persons directly responsible for the operation of the systems.

SECTION 5 CONCLUSIONS AND RECOMMENDATIONS

TASK 1: BUILD UPON THE EMERGENCY POWER PROGRAM (EPP) REPORTING, ACHIEVEMENT AND OTHER SUPPORT

1. Plans for sustaining of LEAP urban pilot projects should be incorporated into planning for sustaining EPP projects. Specifically, it will be necessary to train LEC staff in maintaining the pre-payment meter software and hardware so that there is no interruption of service to the more than 200 customers who will be dependent on the system. LEC staff has only been trained to operate the system and relies on ACTARIS, the pre-payment system supplier, to provide maintenance support from South Africa. This is not a sustainable or desirable strategy for such an essential service.

2. Beyond support for the LEAP pilot project additional capacity building for LEC and MLME is required. Both organizations require additional training and mentoring, and would greatly benefit from continued exposure to international best practices and updating of skills.

TASK 2: ENERGY SECTOR REFORM

1. Now that there is policy clarity, the Government and its development partners can define projects and programs for implementing the new policies and legislation.

2. Energy sector reform is an exercise in cultural change and capacity building which can only be accomplished at the pace dictated by key stakeholders. A program for such reform needs to be planned over a longer period of time than originally envisaged.

TASK 3: URBAN COMMUNITY DEVELOPMENT PILOT

1. The workplan was adjusted owing to constraints largely outside the control of USAID and IRG's LEAP project team. By the end of the 60 day extension period the remainder of the meters had been connected but not all of them were energized. The number of meters energized will depend on progress in resolving the generator loading constraints, an activity under EPP.

2. The use of non-utility vendors has given LEC the equivalent of two large creditworthy customers who in turn have not had any problems recovering their money from the end-users. However, the vendor's commission has not been established on any scientific basis and further study should be performed to establish the optimum commission level that will reflect a fair share of benefits between the utility, customer and vendor.

3. Pre-payment meters have helped customers to control consumption and expenditure to suit their payment ability. None of the 27 Wroto Town customers (note that one customer has two meters, hence 28 meters in total for the 27 customers) have been disconnected in contrast to 71 out of 106 conventional customers in the same area who have been disconnected at least once for non-payment.

4. No thefts have been recorded among the pre-payment meter customers. In contrast, electricity theft is a major problem for conventional meter customers. Historically, LEC has experienced losses of over 40% due to theft and inefficiencies in metering, billing and collection. An energy monitoring program under EPP has managed to keep current losses at about 14%.

5. The pre-payment meters used for the pilot program only allow a simple single rate tariff. Under LEC's current tariff structure this is not a problem, but in future if a two-part or time of use tariff is implemented, it could not be implemented using the current pre-payment meters.

6. Slow customer connection rates have been partly due to customer constraints in wiring their premises to LEC standards. The rate of customer connections would be accelerated using pre-wired compact distribution panels that have been successfully used in South Africa's highly acclaimed electrification program for low income communities living in substandard housing structures.

TASK 4: IMPROVED RURAL ENERGY SERVICES

1. The Government of Liberia needs to be commended and supported for taking steps to extend energy access to previously neglected rural poor. The creation of the prototype RREA is a tangible commitment to the restructuring of the energy sector because it ends LEC's monopoly and opens up opportunities for increased private sector involvement.
2. Private enterprises that are benefiting from solar systems should be asked to pay for the system in light of the enormous growth of their business that can be expected.
3. The electrification of public institutions rather than private enterprises provides for greater socio-economic impact. Funding be sought to subsidize the supply and installation of solar systems to schools and clinics.

ANNEX 1: MOU FOR LEAP SOLAR PILOT PROJECT EQUIPMENT

NOW THEREFORE

The parties to this Memorandum of Understanding (MOU) agree as follows:

1. USAID agrees to hand over the Demonstration Projects implemented under LEAP to the MLME as of the effective date of this MOU;

2. Upon such handover, the MLME agrees to:

    1. Designate the prototype RREA to be the custodian of the projects;

    2. Ensure that the prototype RREA establishes service contracts with the person or institution benefiting from the installed solar system on mutually agreed terms and conditions designed to ensure the safe custody and continued operation and maintenance of the equipment handed over; and in addition that such contracts shall provide for the transfer of ownership to the beneficiaries at an appropriate time;

    3. Ensure that the prototype RREA also establishes service contracts with companies that have the technical competency and experience in providing operation and maintenance services for the equipment relating to the Demonstration Projects;

    4. Ensure that the prototype RREA shall hand over all contracts and agreements relating to the Demonstration Projects to the official RREA when it is established; and

    5. Ensure that the prototype RREA and subsequently the official RREA collect and disburse any monies only for the purposes of fulfilling the obligations under the terms of the service contracts; toward this end the MLME shall conduct periodic audits of RREA accounts and operations and shall make such audits and related reports available to interested parties; and

3. The parties each agree that USAID is absolved from any liability related to the Demonstration Projects, the MLME and/or RREA management of any related service contracts, fees and all other operational matters related to the LEAP Demonstration Projects.

FORCE AND EFFECT OF THIS MOU

The purpose of this MOU is to set forth the understandings and intentions of the parties with regard to the activities described herein. The parties to this MOU specifically acknowledge that this MOU is not an obligation of funds, nor does it constitute a legally binding commitment by either party or create any rights in any third party. Notwithstanding the date of signing, this MOU is deemed to become effective as of February 28, 2009, or at another time as agreed to mutually by the parties.

IN WITNESS WHEREOF, the Parties hereto have caused this MOU to be signed in their names as below:

On behalf of the Government of Liberia

Dr. Eugene Shannon
Minister of Lands, Mines and Energy

Date: 24/02/09

On behalf of the United States of America

Pamela White
Mission Director
USAID/Liberia

Date: 02/23/2009

		Solar spares	Solar Technologies Incorporated	06539591
		320 SWP	Duport Rd Clinic, Paynesville	06581602
Nimba	Sanniquellie	260W SPS; 2 SSL	Try & See Woodwork	06474066
		1040W; 2 SSL	Sanniquellie High School	06431768
		520W SPS; 2 SSL	ARS Guesthouse	06574175
River Cess	Cestos City	Taa Bora system	Supreme Stitches Tailoring	
		Taa Bora system	Nimley J. Toe Fishery Co.	
		Taa Bora system	What's the Promise Fishery	
		Taa Bora system	New Hope Carpentry Shop	
		Taa Bora system	God is Great Fishing Co.	06445929
		2x520W SPS; 4SSL	Cestos City High School	
		520WSPS; 2SSL	Gbesse Junior School	06883110
Sinoe	Greenville	520W SPS; 1 SSL	Cooper Pastry Shop	06829591
		520W SPS	County Administration Building	
		520W SPS; 1 SSL	Be Honest Fishery Shop	06621052
		520W SPS; 1 SSL	Cecilia Beauty Saloon	06698617
		2x200W SSL	F.J. Grant Hospital	06824274

This is to certify that the above installations have been done, or are in the process of being done, under the responsibility and supervision of the undersigned:

DATE: Feb. 23, 09

Reginald Gardiner
Solar Technology Incorporated (STI)
INSTALLATION CONTRACTOR

DATE: 23 February 2009

Augustus Goanue
Center for Sustainable Energy Technology (CSET)
PRINCIPAL OFFICER (designate), prototype RREA

ANNEX 2 CHARTER LETTER FOR RREA

REPUBLIC OF LIBERIA

THE PRESIDENT

RECEIVED
22 MAY 2008

EJS/MOS/RL/516/'08

May 21, 2008

Honorable Eugene H Shannon
Minister of Lands, Mines & Energy
Ministry of Lands, Mines & Energy
Monrovia, Liberia

Dear Minister Shannon,

This acknowledges receipt of your letter of May 8, 2008 by which you proposed the establishment of a Prototype Rural and Renewable Energy Agency (RREA) in the Ministry of Lands, Mines & Energy until such time that the RREA can be fully established as a semi-autonomous agency as proposed in the draft National Energy Policy. I have noted that with the establishment of a Prototype, there is likely to be support from some of our partners who have interest in your Ministry's plan to introduce alternative sources of energy in our rural areas.

You have my concurrence to proceed along the lines that you have proposed. However, we must move quickly beyond drafts and interim arrangements to bring our policies and institutional implementation arrangements to materialization.

Sincerely,

Ellen Johnson Sirleaf

FYA urgently
Amb. Minister A. Chie
USAID
Other Partners
LEC
cc: Hon. ECB. Jones

Please Act Accordingly

ANNEX 3: SELECTED PHOTOS OF LEAP ACTIVITIES

(Provided via separate CD-ROM delivered by hand to USAID Liberia)