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MARKET TOWN ELECTRIFICATION ASSESSMENT REPORT

ASSESSMENT OF ELECTRIC SYSTEM SUSTAINABILITY AND
RECOMMENDATIONS IN YEI, KAPOETA AND MARIDI

8 APRIL 2011

This publication was produced for review by the United States Agency for International Development. It was prepared by Thomas J Sherwood, Gary D. Fullerton and Management Systems International.

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YEI, KAPOETA AND MARIDI



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ACRONYMS

GOSS	Government of Southern Sudan
IPP	Independent Power Plant
kWh	Kilowatt Hour
LBG	The Louis Berger Group, Inc
MEM	Ministry of Energy and Mining
MSI	Management Systems International
NRECA	National Rural Electric Cooperative Association
PPP	Public-Private Partnership
SDG	Sudanese Pound
SISP	Sudan Infrastructure Support Project
SME	Small and Medium Enterprises
SOW	Scope of Work
SSEC	Southern Sudan Electricity Corporation
SSREP	Southern Sudan Rural Electrification Project
SUPPORT	Services Under Program and Project Offices for Results Tracking
T03	Task Order Three
USAID	United States Agency for International Development
YECO	Yei Electric Cooperative

EXECUTIVE SUMMARY

This assessment focuses on the sustainability and organizational form of utilities in Yei, Maridi, and Kapoeta that have been financed by the United States Agency for International Development (USAID). These are subscale, integrated generation and low voltage distribution systems serving a very limited number of customers. The utilities themselves have been organized (in the case of Yei) and conceived of (in the cases of Maridi and Kapoeta) as cooperatives. It is beyond question that their impact on the local communities they serve has been profound. In the authors' collective experience, we have not previously seen any project that has so positively benefited a local population nor that has been so positively received and appreciated.

Of issue for this assessment, however, is the sustainability of these nascent utilities. Sustainability can be variously interpreted, so at the outset the assessment team was faced with the question of how to define it for the purposes of this assessment. Using a commercial definition, sustainability is the utility's ability to obtain revenues in order to achieve a full cost recovery through its tariff for its services, both currently and in the future. In fact, sustainability in the short term would be a misnomer if the utility were not sustainable in the long term, due to fundamental issues with its cost structure. Expansion of the system is implicit in the definition, as it is inherent in the utility's obligation to serve.

The team leader on this assessment was also the team leader on the Southern Sudan Rural Electrification Project (SSREP), and so his perspective was informed by visiting the Yei Electric Cooperative (YECO) in 2008 and again in 2011 (see Annex 3, Background of the Authors). Additionally, both members of the team are mindful that the provision of power to rural populations in developing countries is in large measure a social service, some of which can be on a commercial basis, but most of which needs explicit external support. Broadly speaking, obtaining the necessary support can only be achieved by building consensus among stakeholders to arrive at a balance among technical/economic goals, political/stakeholder goals, and ownership structure goals.

Critical to this dialogue is making the value of an unserved kilowatt hour (kWh) clear to government as a development issue. By way of example, the Department of Energy in South Africa put that figure at R75/kWh (about 10 USD per kWh). So the difference between the tariff collected by the utility in satisfying this unserved demand and this estimated cost is the value the government in South Africa derives as facilitator of development. It is also, by extension, the amount of subsidy it could reasonably provide.

Thus central to the task of building the sustainability of the utilities and the industry as a whole is the task of defining and making explicit to stakeholders the full cost of the system. It is with this in mind that this assessment has been carried out.

PRINCIPAL FINDINGS and CONCLUSIONS

Beginning in 2008, first through SSREP and then through the Sudan Infrastructure Support Project (SISP), USAID financed the creation of three Market Town Utilities in Yei, Kapoeta, and Maridi. As mentioned above, these are subscale, island-type utilities with small diesel gensets serving a very small number of customers. These utilities are privately owned by their members/customers and are intended to have been set up as cooperatives. These utilities are supplying power at tariffs approaching or exceeding the limits of affordability (up to 1.50 SDG/kWh), but even at these high tariffs, they are not recovering their full costs of service because they are understaffed and do not recover capital equipment depreciation and because fuel costs are rising inexorably. Financially, this is a non-sustainable state of affairs.

Additionally, though much has been achieved under training already provided by NRECA and funded by USAID, significant training requirements still exist. Complicating this situation further is the fact that the cooperative form of organization may prove problematic, as cooperatives fall outside the mandate of the Ministry of Energy and Mining (MEM) and are currently under the remit of the Ministry of Cooperatives and Rural Development. USAID and the government of Southern Sudan (GOSS) are currently reviewing the utilities' organizational form to assess whether it would be better to change them from cooperatives to customer-owned joint stock companies so as to benefit from the centralized planning that the MEM

will provide, as well as benefiting from stronger budgetary support available from MEM than would be the case from the Ministry of Cooperatives and Rural Development, where they currently reside.

Most recently, in January 2011, the Southern Sudan Electricity Corporation (SSEC) Provisional Order, 2011 was executed, which modified the original intention of having the SSEC control distribution, limiting its role to generation and transmission (defined as down to the 33 kV level). Worryingly though, both generation and transmission have been amalgamated into one company, which will unnecessarily aggregate operations and financial information and thus result in confusing pricing signals between the two functions. In the long run, correct pricing signals will be essential to attract independent power plant (IPP) companies.

Since the SSEC is responsible for all generation in Southern Sudan according to the Provisional Order, the Market Town Utilities will need to work with the SSEC if the utilities wish to avail themselves of the lower-cost power in the future. At a minimum, the utilities will need to have legally binding relationships with the SSEC, entering into power purchase agreements with them. This is commonly referred to as a type of Public-Private Partnership (PPP). Moreover, in practical terms, the utilities will need to plan with the SSEC for the development and delivery of bulk power, which will require them to develop a strong working relationship with the SSEC.

PRINCIPAL RECOMMENDATIONS

With respect to the Market Town Utilities, the assessment team recommends that the utilities be re-established as joint stock companies owned by their customers, the effect of which will be to limit the liability of the customer/shareholders to the capital they contributed; it will also facilitate partnering in PPPs with the GOSS and the SSEC. This restructuring will also remove an administrative and accounting burden from the utilities and, most importantly, will have the beneficial effect of transferring the entities out from under the Ministry of Cooperatives and Rural Development, thereby having them incorporated into the portfolio of the MEM.

The assessment team also recommends that USAID continue the excellent training support for the Market Town Utility staff beyond the current cut-off date of September 2011, and that USAID and National Rural Electric Cooperative Association (NRECA) jointly develop and supervise a medium-term support program that takes advantage of local training resources offered by Uganda Electricity Distribution Company, as well as by Kenya Power and Light.

To be proactive in the wider context of the Southern Sudan environment (and also to support the Market Town Utilities), there are a variety of actions that the Assessment Team recommends be taken in the short to medium term to support the MEM and the SSEC.¹ These include:

- The establishment of a Rural Electric Fund and a Rural Electrification Agency to administer the Fund (this in particular would be the mechanism through which external financing would be provided to the Market Town Utilities), initially financed from the GOSS Central Budget (possibly supported by donor funding) and later through a charge in the tariff to grid connected customers once a grid has been built and/or lower cost power is available to certain large distribution networks in the State capitols;
- The preparation of a Master Plan for the development of the Electric Sector;
- Pursuant to the Master Plan, the development of Least Cost Generation Plan;
- The provision of technical assistance to the MEM in reorganizing the institutional framework, including the finalization of the Electricity Law and the creation of an independent regulator;
- The provision of technical assistance to the SSEC to build management and operational capacity within its mandate and the separation of the SSEC into two independent

¹ Short and medium terms are defined as one year and one-to-three years, respectively. These meanings with respect to the short and medium terms will be used throughout this report. Based on the assessment team's observations, the SSEC's capacity is severely limited; however, under the Provisional Order, the SSEC is the legally mandated partner for all power generation and transmission in Southern Sudan and the team consequently believes that capacity building efforts should in large measure be focused on the SSEC.

companies covering generation and transmission, instead of the amalgamated form in which it now is;

- The establishment and support of an electric utility training institution to remedy critical deficiencies in utility management and technical capacity; and
- The creation of a small and medium enterprise (SME) lending program exclusively focused on electricity consumers to help build utility load (vital to building a sustainable distribution network in rural areas).

I. INTRODUCTION AND BACKGROUND

I.1 Southern Sudan Electricity Sector

The Southern Sudanese Electricity Sector is characterized by the lack of a transmission grid; moreover, power is generated by high-cost, small- to medium-sized diesel powered gensets.² Power is largely unavailable in most of the country, and where it is available—in Juba, in some of the state capitals, and in three market towns—it is expensive, subsidized at great cost, and/or distributed erratically through worn out networks that are poorly run. Due to the nascent country's size, topography, climate, and diminished institutional capacity (the result of over 50 years of civil war), as well as the lack of passable roads, absence of an industrial base, and the unavailability of commercial financing, huge challenges must be overcome to build an electricity sector to provide energy to its population.

On the positive side, the country has large petroleum reserves and associated gas from which cheaper power could be generated. In 2007, the GOSS formed the Southern Sudan Electricity Corporation (SSEC), with the original intention of assigning SSEC the right to own and operate all electric power generation, transmission, and distribution assets in Southern Sudan. This, however, has been subsequently modified to exclude distribution. A Provisional Order establishing the SSEC has been signed on January 7, 2011, creating the institutional platform from which to address the challenges ahead.

Originally through the Southern Sudan Rural Electrification Project (SSREP) and, more recently, through Sudan Infrastructure Support Project (SISP), USAID has supported the GOSS in developing the National Electric Sector Policy that was approved in July 2007. USAID has also supported the development of the Electricity Act that is currently under final GOSS review. Moreover, the widely recognized benefits of the SISP Program have helped lift the issue of electricity sector development to a priority of the GOSS, and, as a consequence, substantial assistance from the central and state budgets is expected for the first time. USAID has shown the way forward with its successful SISP program, setting up Market Town Utilities that have had a massively positive impact on the lives of the communities they are serving.

Most importantly, a dialogue among USAID, the GOSS, and the state governments has been established, and critical to the success of this dialogue has been making clear to the GOSS and the state governments the value and cost of an unserved kilowatt hour (kWh) as a development issue. By way of example, the Department of Energy in South Africa put that figure at R75 per kWhⁱⁱ (about \$10 per kWh). The difference between the tariff collected by the utility in satisfying this unserved demand and this estimated cost is the value the government in South Africa derives as facilitator of development. It is also, by extension, the amount of subsidy it could reasonably provide.

The GOSS and some of the state governments now agree that the provision of power to rural populations is in large measure a social service for which they are responsible, some of which can be put on a commercial basis, but most of which will need explicit budgetary support.

The Current State of Commercial Operations in the Electricity Sector: The commercial cycles of all the utilities have been extremely problematic, with very high levels of commercial losses and low collections that critically restrict the utilities' cash flows. No reliable data is available, but the results are clearly visible. The lack of adequate cash flow has resulted in systemic under-investment and a consequent progressive degradation of services. It has also forced the state and central governments to provide subsidies, though their own payment records for the services they receive have been dismal and have further distorted the utilities' performance. Complicating the situation further has been the lack of capacity within the Southern Sudanese professional pool in the core competencies required to manage electric utilities. These include accounting, billing, and collections; human resource management; maintenance; and general management.. Finally, aggravating all these problems is the fact that tariffs are set below the full cost of service—below even the cost of fuel to run the generators. Current tariffs in

² Gensets are fossil-fuel (gasoline or diesel) powered generators.

Juba, for example, are set at 0.58 SDG per kWh, while fuel costs have risen to amounts approaching 1.00 SDG per kWh.

1.1 The Project

The Yei Electric Cooperative (YECO) was set up in 2008 as part of the Southern Sudan Rural Electrification Project (SSREP), the purpose of which was:

1. The introduction and provision of street lighting as a measure of public security in Yei town, and
2. The provision of reliable and affordable electricity that would facilitate operations and expansion of businesses in Yei town.

In 2009 USAID and its partners, the Louis Berger Group (LBG) and the National Rural Electric Cooperative Association (NRECA), embarked on a new project (SISP), the purpose of which included the following:

1. Establishment of systems and capacity for sustainable management of YECO;
2. Capacity building of the GOSS Ministry of Energy and Mining and the Southern Sudan Electricity Corporation to be better placed to develop and manage sustainable electric power supply to market towns of Southern Sudan; and
3. Establishment of electric utilities in selected towns of Southern Sudan, including related management structures and systems.

Currently, the customer base in Yei is 1150 people, and YECO enjoys a bill collection rate of over 95 percent (excluding accounts for the local hospital and street lighting)—this despite a tariff that is the equivalent of \$0.58 per kWh.

The market towns of Maridi and Kapoeta were selected as sites for two new utilities after an assessment was carried out to look at other market towns and options for expansion in Southern Sudan. These new utilities will be fully commissioned in 2011. Both systems will have the capacity to generate 0.8 megawatts each when fully operational, and both are expected to face the same set of challenges that YECO faced and to some extent still faces.

The main question for this assessment is whether YECO is sustainable and, by extension, whether the utilities of Maridi and Kapoeta will be sustainable or will face more severe or different challenges that will undermine sustainability. A concomitant question is whether the YECO cooperative model is suitable to the Southern Sudan environment.

The Sudanese environment as it relates to the development of these Market Town Utilities has been conditioned by the passage of two provisional orders in January of 2011. The first set up the Southern Sudan Electricity Corporation, charging it with the ownership and development of all generation and transmission systems in Southern Sudan. The second order mandates the re-registration of all cooperatives, and mandates the process by which they shall be governed. It has been noted elsewhere in this report that, as a cooperative, YECO would fall in the portfolio of the Ministry of Cooperatives and Rural Development, not under the Ministry of Energy and Mines.

2. METHODOLOGY AND ASSESSMENT QUESTIONS

2.1 Methodology

The methodology employed in this assessment examined factors which predominantly influenced the development and ability of YECO to function moving forward (i.e. sustainability) and which will therefore serve as an example for the new utilities in Maridi and Kapoeta. Also examined by the assessment team were those factors that resulted in the selection of the cooperative model, and whether this form of organization is appropriate in the context of Southern Sudan (i.e. the suitability of the cooperative model).

The Assessment Team has followed an assessment methodology consisting of four broad steps:

1. **Defining of the Assessment Focus Areas:** The focus areas are the analytical lens for the assessment. They are derived from the “Assessment Purposes and Objectives” in USAID’s Scope of Work, as well as from discussions with USAID and MSI. The assessment team has summarized the focus areas for this assessment in Section **Error! Reference source not found.** elow.
2. **Defining and Executing Fact-Finding Approaches:** The team used three main fact-finding approaches:
 - Review of NRECA Documents: The principal documents reviewed include LBG/NRECA’s Quarterly Reports, as well as a myriad of other documents. LBG/NRECA also furnished financial and operating information in various spreadsheets or in response to email communications. All of these sources are referenced throughout the text and in Annex 2. Where necessary, the Assessment Team has clarified various points drawn from these documents through interviews with LBG/NRECA staff.
 - Interviews: With the guidance and assistance from the MSI SUPPORT project and USAID colleagues, the team has conducted interviews with a variety of stakeholders. The full list of interviewees is included in the Annexes. The various topics collectively covered in planned interview questions are set out in Section 0 below.
 - Quantitative Data Requests: For several specific issues (including various operating and financial statistics of YECO), the assessment team has submitted quantitative data requests to various interviewees. These requests are included in the information provided in Section 0 below.
3. **Analysis and Synthesis, Formulation of Conclusions and Recommendations:** The information collected in the previous step was analyzed within the context of the assessment questions, also bringing in views and data from the authors’ experience. From this, analyses of each question were made and additional conclusions and observations were made.
4. **Obtain and Appropriately Reflect Draft Review Feedback:** Feedback from SUPPORT project staff and USAID colleagues was obtained on the initial Findings/Conclusions /Recommendations (as provided in a final out-brief session with USAID in Juba, as well as via an initially submitted draft report) and was incorporated as appropriate into a final report.

This methodology was implemented over the course of a four-week mission by the assessment team to Juba, Yei, and Kapoeta. The activities for the mission are shown in the Assessment Calendar in Annex 4.

2.2 Assessment Focus Areas

The assessment team has proceeded with this assessment mindful of the USAID Specific Verifications Requested. They were:

Specific Verifications Requested (SVRs) - USAID wanted to verify the current state of operations and suitability of the YECO utility model including:

1. The process undertaken to select a cooperative structure in Maridi and Kapoeta,
2. The suitability of this model for achieving the goal of a sustainable provision of electricity,
3. Alternative models that could be used with a high degree of certainty within the Sudanese context, and
4. Additional assistance that may be needed over the medium to long term to ensure the management capacity and access to credit and/or government funds needed to sustain and expand operations is available.

Accordingly, six focus areas were identified. These are:

1. Assess the current and projected levels of financial sustainability of YECO, including issues of non-payment and unregistered connections.
2. Assess YECO's current technical, financial, and commercial management capacity and its ability to meet ongoing capacity development needs.
3. Assess the level of management capacity likely to be in place in both YECO and electricity providers in Maridi and Kapoeta by the end of the project.
4. Assess YEI government and community leader satisfaction with the cooperative management structure being utilized.
5. Assess the effectiveness of the methodology utilized by LBG/NRECA in assisting local government and community leaders in Maridi and Kapoeta to assess a variety of management options, and to select an appropriate management structure.
6. Assess the anticipated level of sustainability of cooperatives in Maridi and Kapoeta under a YECO-style cooperative structure, including an assessment of assumptions utilized, (i.e. willingness to pay) and key risk factors.

Additionally, the assessment team was asked to make three specific sets of recommendations.

1. For any identified financial sustainability gaps, provide options and recommendations to address these gaps, including collection procedures, rates, technologies, and an assessment of the feasibility of accessing needed additional capital from financial institutions. When appropriate, highlight appropriate roles for the provision of financial and/or regulatory support from local and/or national government entities.
2. If significant management capacity gaps are likely to remain upon the completion of the project, provide recommendations for cost-effective and sustainable means to meet medium and long term capacity development requirements.
3. If the current cooperative management model is inappropriate or incomplete, the assessment team should provide recommendations and detailed examples of alternate management structures that could be utilized to overcome sustainability constraints and that are likely to succeed within the southern Sudan context.

2.3 Fact Finding: Interview Topics and Data Requests

In order to address the assessment questions, it was necessary to define specific topics to be discussed in interviews and specific data to be requested. Accordingly, the assessment team identified two general areas of interview topics, each of which were intended to help address one or more of the assessment questions. These two areas were split between a set of interview topics and data requests regarding the sustainability of the YECO enterprise as a commercial proposition (2.3.1), and a topic and data request set dealing with the suitability of the cooperative model in the local Sudanese context (2.3.2).

2.3.1 Commercial Sustainability

The Concept Paper on Establishment of Sustainable Electricity Service Providersⁱⁱⁱ and the LBG Task Order Three (T03) Proposed Scope of Work (SOW)^{iv} stated that there were a multitude of shortcomings and challenges related to the capacity to manage these utilities while nonetheless their operation had to be entrusted to local personnel due to cost reasons and a strong preference for the local non-governmental distribution company model. The assessment team sought to clarify these issues as they pertained to the issue of commercial sustainability by an examination of the following.

1. Financial statements (balance sheets and income statements) for YECO from inception to most current.
2. Copies of the by-laws, shareholder/stakeholder meeting minutes of YECO, and for the others.
3. Separate accounts from Louis Berger and NRECA for each of the utilities, showing the amount spent on equipment (segregated by utility).
4. Maintenance logs for YECO.
5. Tariff schedules for utilities.
6. YECO Collections/Bad Debt analysis.
7. Memos, background documents, as well as communications with USAID, from NRECA and LBG that articulate the assumptions utilized, including willingness to pay, and key risk factors, which went into the derivation of the anticipated level of sustainability of cooperatives in Maridi and Kapoeta.
8. Projections of the future cost and periodicity (e.g., five-year cycle) of major maintenance programs that are planned throughout the life cycle of the diesel generators and other major pieces of equipment for YECO.
9. Projections of any planned increases in staffing and operating costs for YECO.
10. Any studies of cost of service for the three Market Towns that were used as a basis for the rates in tariff discussion papers and/or the establishment of any published tariffs.
11. Historic and projected percentage of time that the diesel generators and overall system have been and are expected to be in service and/or percentage down times. Also, any redundancy built into the YECO generation system.
12. Tariff adjustment regulations, mechanisms, and procedures that are currently in place or planned for YECO.
13. Most recent drafts of the Electricity Act, the Provisional Order establishing the South Sudan Electric Corporation, the Provisional Order on Cooperatives, and any other related legislation under consideration by the government.
14. Direct observation at YECO of the following:
 - i. Existing condition of plant and equipment;
 - ii. On-site estimate of remaining useful life;
 - iii. Areas of potential operational performance improvement; and
 - iv. Company management capacity.
15. Assessment of Company support services (accounting, administration, HR):
 - i. Review Employee resumes and Organization Chart;
 - ii. Review of future training and capacity development programs planned by the SISF and the likely management capacity that will be in place at the end of the project; and
 - iii. Conduct on-site interviews with YECO and NRECA personnel.

2.3.2 Suitability of the Cooperative Model

The assessment team also assessed the level of understanding in Yei, among the YECO Board and staff and with members/stakeholders, regarding the basic cooperative principles and how well they have been communicated and adhered to, particularly in the case of YECO, which has been operating for some time. The assessment team also assessed their appropriateness in Maridi and Kapoeta and in the broader Southern Sudanese electricity sector development context. These were derived from:

1. Interviews with Stakeholders in Yei to ascertain their level of understanding and satisfaction and adherence to the cooperative model.
2. Interviews with LBG/NRECA personnel.
3. An examination of the cooperative by-laws and YECO's accounting practices as they related to the maintenance of members' capital accounts.
4. Memos and other internal background documents of NRECA and LBG, particularly communications with stakeholders that reflected the methods used to assist local government and community leaders in Maridi and Kapoeta in assessing and selecting an appropriate form of organization.
5. SSREP—NRECA PROJECT—Summary Completion Report—2008.
6. Interviews with stakeholders in the Kapoeta and Maridi utilities.
7. Most recent draft of the proposed Electricity Act, the Southern Sudan Electric Corporation Provisional Order, and the Cooperative Societies Provisional Order—2011.
8. Meetings with the MEM and the SSEC to discuss plans for organizing the structure of the electricity sector in Southern Sudan.

2.4 Data Limitations

The authors have prepared this report based on a combination of document reviews, interviews, and quantitative data that it collected as well as the answers provided by key informants, in response to written requests for information. The assessment team has reviewed the information obtained from these various sources to ascertain whether it is reasonable and where possible has triangulated information to determine validity. The assessment team has not, however, audited the information provided.

3. PRINCIPLE FINDINGS FOR ASSESSMENT FOCUS AREAS

In this section, the assessment team summarizes the relevant findings for each of the six focus areas. The team notes that the process of organization of individual “findings” to an individual focus area is to some degree arbitrary, since some findings have relevance to multiple areas and to recommendations drawn later from the conclusions.

3.1 Principal Findings Relevant Focus Area I

Assess the current and projected levels of financial sustainability of YECO, including issues of non-payment and unregistered connections.

3.1.1 The current tariff does not include an allowance for depreciation. This is the result of a deliberate policy. The rationale for such is that, since the investment in the utility was in the form of a grant, no depreciation should be taken.^v This policy has been commented on previously in the 2008 SSREP Assessment Report, and a recommendation was made then that depreciation on the equipment component of the grant be incorporated into the tariff^{vi}, as the equipment would someday have to be replaced from funds generated by the utility.

Documents reviewed during the course of this assessment obtained from LBGI/NRECA show that the value of the generation and distribution equipment as installed in YECO was \$1,556,469.^{vii}

3.1.2 There is no reserve for replacement of equipment, contrary to the YECO tariff paper.³ See 0 above. The reserve that is being provisioned is for anticipated overhauls and is treated on the books of the company as a maintenance reserve. The 2010 contribution to this maintenance reserve was only 63,545 SDG (\$24,440), and the set-aside, while separately reflected on the balance sheet as a liability for generator repair, is not segregated from the operating bank accounts of the company. It will be noted that Unit #1 suffered a fault, removing it from service for six to seven months. Fortunately there was no lost revenue, as there is excess capacity in the form of two additional units available but not ordinarily in service due to a lack of demand. See also paragraph 3.6.5 below.

3.1.3 Moreover, the assessment team has noted that **there are conflicting views on the life of the equipment in service.** The Scope of Work under which this Assessment was conducted states that the utility assets “... are expected to last 20+ years.” The SSREP Assessment Report noted that Lahmeyer International estimated the life of similar generation equipment in Uganda at five to seven years, assuming continuous operation of the generation equipment, and up to ten years for non-continuous use^{viii}. In an interview with the Chairman of the South Sudan Electricity Corporation (SSEC), a similar view was held regarding the expected life of the equipment^{ix}. Finally, in an interview with Francis Mills of NRECA in Kapoeta, he gave the expected life of the gensets as 40,000 hours, which would equate to five years of continuous operation allowing for about 10 percent downtime for maintenance and repairs^x. The conductor life, on the other hand, should be 25 years.

3.1.4 Finally, **asset values that should be depreciated have not been adjusted upwards** for the 30 percent decrease in the carried value of the assets of the books of the company when taking into account

³ The assessment team has noted that depreciation is being taken on the balance sheet against the equity accounts of the contributors (USAID, NRECA, etc.), but not as an expense against operations. The team believes that, because depreciation is not being taken as an expense as part of the full cost of service tariff for the utility, the profitability of the entity reflected on the income statement is misleading with respect to its sustainability (defined here as the utility’s ability to finance itself). The tariff explanation/description that the team was provided included a representation that the replacement reserve amount served the same purpose as depreciation, but in practice the replacement reserve is being used for maintenance expenses—not as a reserve for replacement of equipment.

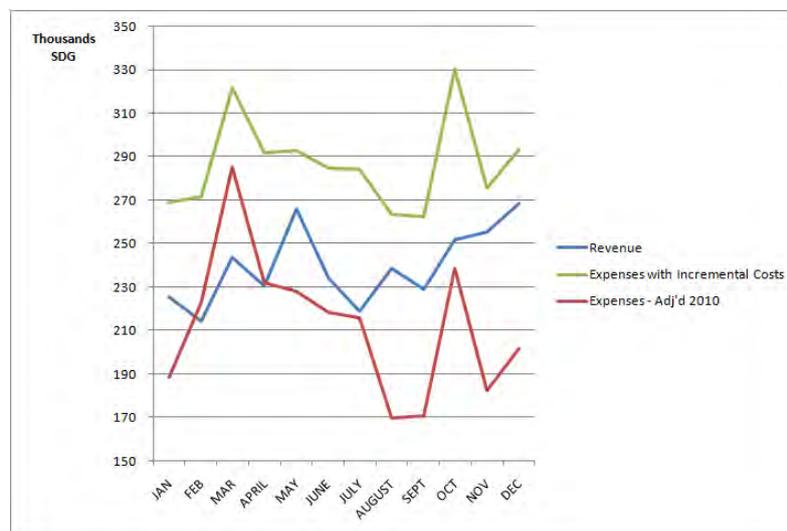
the change in value of the dollar relative to the local currency (SDG).⁴ The YECO balance sheet shows the assets in local currency based on the prevailing conversion rate effective in 2008. This rate of dollar to SDG exchange was 1:2 during the period the balance sheet was constructed. An upward valuation of the assets at the official rate of exchange at the time of this writing amounts to 30 percent.^{xi}

3.1.5 Therefore, based on an asset value of \$1,556,469 carried at current official rates of exchange and depreciated over 10 years, the unmet replacement cost that would otherwise be required in the tariff to achieve full cost recovery is 498,000 SDG, which translates into an increase of some 17 percent above current tariff levels. But the current tariff is running at the upper limit of affordability—1.50 SDG/kWh for energy. According to the Board of Directors, the target tariff is 0.75 SDG/kWh.^{xii}

3.1.6 While YECO is covering its operating costs and was cash flow positive for the period under review in 2010, its positive cash flow was achieved in no small part by a monetization of its assets and a concomitant increase in its liabilities, rather than through earnings.⁵ The other major contributor to the positive cash flow of the company in 2010 was a quantity-based fuel purchase contract that will be exhausted around September or October 2011, so the positive effect of this is temporary in the rising fuel cost environment in which the company is operating.⁶ See 0 below.

3.1.7 For YECO, based on its financial statements, the assessment team found that revenue requirements would be significantly higher if depreciation, the need to fill critical vacancies, and the market price of fuel were taken into consideration. In the graph below, YECO’s revenues (blue line) and expenses (red line) for 2010 are shown; in addition the assessment team shows the expenses with the aforementioned incremental costs incorporated (green line). Clearly, their effect on the performance of the utility is strongly negative if they are taken into account.

Figure 1: The Effect of Reflecting Revenue Requirements on the Cost Structure of YECO



YECO will be operating at a significant loss based on the current tariff, if all costs are recognized. The effect of adding depreciation alone pushes up the tariff to 1.60 SDG/kWh (a 7 percent increase) from its

⁴ On the issue of revaluation, International Accounting Standard (“IAS”) 21 requires a material revaluation in the case where the fair value of the assets is not adequately reflected on the balance sheet. This is the case where there has been a currency revaluation, particularly since the assets employed generate revenue in a currency other than the currency that is necessary to fund the assets’ replacement. It should be noted that Sudan is a member of the International Federation of Accountants (IFAC), who have adopted IAS.

⁵ What this means is that the company generated cash by consuming certain assets, like inventories, while not replacing them, and they allowed certain liabilities to climb without paying them down. By consuming assets and allowing liabilities to climb (also in a sense a monetization) the company generated cash, but in the normal course of business when comparing the net YE cash positions for 2009 and 2010 it is necessary to look at these factors before deriving false comfort from the amount of cash on hand at the end of 2010 (as some might be tempted to do) – as it all didn’t come from income. Only an audit will reveal the true picture.

⁶ This is a non-sustainable state of affairs, and when current and future fuel prices are taken into account, as detailed in the following paragraphs, coupled with higher staffing costs and an adequate reserve to reflect asset depreciation, the utility will need external financial support, as it is not sustainable “as is.”

current level of 1.50 SDG/kWh; when additional labor costs and market fuel prices are added, the resulting tariff would have to be 1.81 SDG/kWh (a 21 percent increase).

3.1.8 Each month YECO apportions the uncollected streetlight and hospital bills among its paying customer base. The company treats the moneys received from customers covering the arrears from the street lighting and hospital as revenue. The company does not expense the arrears as bad debt; rather, it has created a contra account on the balance sheet as a provision to Accounts Receivable.⁷ **A proper accounting treatment would be to reflect the amounts received from customers in excess of their regular utilities bill as a liability**, i.e. a loan from customers on behalf of the street lighting and hospital for so long as the amounts owed by government are not expensed through the income statement.

3.1.9 The reserve of five percent for non-payment by non-governmental customers appears to be adequate. Apart from the government's non-payment for the street lighting and hospitals, there does not appear to be a problem with collections.

3.1.10 Management reports that **unauthorized connections are not a problem**, and none were observed by the Assessment Team.

3.1.11 Fuel represents approximately 60 percent of 2010 operating costs. YECO has a long-term fuel supply contract with Hass Petroleum for 600,000 liters at 2.65 SDG/liter.^{xiii} About 50 percent of this amount has been consumed to date at an average monthly consumption rate of 50,000 liters, and fuel prices in the market are currently 3.50 SDG/liter.^{xiv} **Based on an annual consumption of 600,000 liters, the incremental cost to YECO at current market prices would be 510,000 SDG. Once the contract expires, YECO may face a significantly higher revenue requirement.**

3.1.12 There is a levy on fuel of 10 SDG per drum (210 liters).^{xv} Based on YECO's consumption of 600,000 liters annually, this amounts to a tax on operations of 28,570 SDG, which, if it were to be waived by the government, would help the utility in Yei—and also in Maridi and Kapoeta—by lowering the revenue requirement in the same amount.

3.1.13 YECO has three 500 kva/400 kW units, of which only one is usually in service. During peak load, two are put into service. When the assessment team observed the units, they were running at about 45 percent capacity each. Optimal efficiency for these units is above 70 percent. As noted in 0 above, Unit #1 was out of service for a period of six to seven months.

3.1.14 Overall costs at the utility are increasing, and demand is also increasing for services—both faster than the company can accommodate or than the tariff will allow.^{xvi} **Filling the three vacant positions identified by the management of YECO will alone result in additional payroll costs of some 150,000 SDG annually.**^{xvii}

3.1.15 The Board believes that by building out the system, the company achieves sustainability.⁸ The Board is hoping that USAID and/or the GOSS or state governments will help with financing the build-out.^{xviii} YECO has requested funding from the MEM for 800,000 SDG to expand the system to 500 new customers. This money is needed to build out the distribution system—current generation capacity is sufficient to accommodate the expected incremental load. The submission to the MEM was not supported by any cost/benefit analysis.^{xix} The Ministry has not responded. See also paragraph 0.⁹

3.1.16 YECO is not audited, and the 2010 books have so far not been subject to a year-end closing. In reviewing the accounts information, the assessment team observed a few anomalies regarding

⁷ A contra account is an account that offsets another account.

⁸ Perhaps this would be the case if fixed costs do not also increase as well, though the team has found that current fixed costs will rise once depreciation is properly accounted for and once YECO is properly staffed. Given that almost all the high load customers in Yei are currently being serviced, the assessment team is of the view that it is more likely new customers will be correspondingly more cost-intensive to service based on their lower kWh consumption per connection, thereby increasing both fixed and variable costs.

⁹ In the team's experience elsewhere, the unserved customers will put increasing pressure on the utility to expand. In order to do so, the utility must bring its costs down as soon as possible. The team sees definite political and commercial risks here if there is an appreciable delay in funding this expansion.

the treatment of certain line items. **These anomalies will prevent an auditor from giving an unqualified opinion** about the company's financials. One of the most notable problems was the absence of equity accounts as required by the by-laws. Also notable was the issue of fuel inventories, which were often stated as negative amounts. In fact, the average inventory reported for the months in 2010 was also negative, which gives rise to questions about the explanation that was given for this anomaly.^{xx} Also of concern was the treatment of amounts received in payment from customers on behalf of non-paying government accounts as revenue instead of loans from customers. Finally, the assessment team noticed a one-time charge-off of distribution materials of some 159,000 SDG in February 2010, which was explained as an adjustment for a prior error in counting inventory items.^{xxi} It should be noted that, in addition to the by-laws, under the Co-Operative Societies Provisional Order of 2011, audits are now mandatory for all cooperatives.

3.2 Principal Findings Relevant Focus Area 2

Assess YECO's current technical, financial, and commercial management capacity and its ability to meet ongoing capacity development needs..

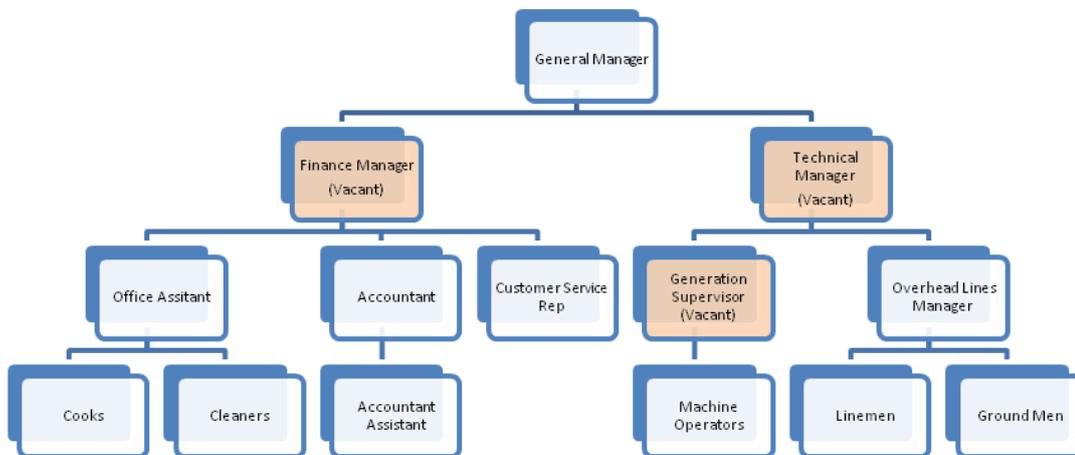
3.2.1 The assessment team observed that YECO's Board is dedicated and highly engaged. Board members are enthusiastic about the company and believe it is providing valuable social and economic benefits to their community. Board members attend monthly board meetings and devote time for working on board committees—e.g., the human resource committee. They seem to understand the challenges facing YECO, and are committed to making YECO a success.

3.2.2 The company is operating efficiently enough to fulfill its mandate of supplying electricity to its current customers. The assessment team heard no complaints about outages or other problems during its visit to Yei.

3.2.3 The General Manager and employees appear to be dedicated and working diligently at their jobs. Moreover, some are filling two positions due to job vacancies—for example, the Overhead Line Manager is temporarily filling the Generation Supervisor's position as well as his own, and thereby managing the operations of the generators as well as the maintenance and repairs on the distribution system.

3.2.4 There are critical gaps in the management structure of the company. Three senior positions are currently vacant at YECO: Finance Manager, Technical Manager, and Generation Supervisor. In addition, the Customer Service Representative has been absent for an extended period due to illness. The company did not have an organization chart, but the assessment team drafted the following organizational chart from the description provided by the General Manager. The organization chart clearly demonstrates the gap in senior management between the General Manager and most of the Company's staff.

Figure 2 - YECO Organizational Chart.



3.2.5 Recruitment of qualified personnel (see also paragraph 3.6.14 for other issues associated with staffing) **may be very difficult, and filling the vacant positions will add substantially to the cost of operations.** The incremental amount of filling the vacant positions is estimated by the NRECA Project Manager at 12,500 SDG per month or 150,000 SDG per year.^{xxii} This amount would reduce the company's 2010 annual surplus of approximately 200,000 SDG to around 50,000 SDG.

3.2.6 YECO's General Manager indicated that **YECO does not have written job descriptions for the key positions in the company.**^{xxiii} The consequences of this are twofold. Firstly, new employees may not have a clear idea of their roles and responsibilities, and secondly, the company personnel must create a description of jobs in order to advertise for applicants for vacant positions. The job description in the advertisement for an Administrative and Finance Manager was inappropriate and better suited for a bookkeeper.^{xxiv}

3.2.7 According to YECO's General Manager, **YECO does not have an employee manual.** The Board's human resource committee is working on the company's human resource policies, which would then allow an employee manual to be prepared.

3.2.8 Membership Certificates have not been distributed to members or even developed, as far as the assessment team could ascertain. Additionally, the Cooperative's by-laws have not yet been distributed to members. According to YECO's by-laws, both are to be given to members when they join the cooperative. Hence, the company has not conformed to certain requirements set forth in the basic organizational document, and members have no evidence of ownership in YECO.

3.2.9 People in existing positions lack sufficient on-the-job experience and training. While NRECA has conducted a number of courses and the older employees have had on-the-job training, all YECO employees indicated that they would like to have additional training. The benefits of training to date were clearly visible, although clear requirements remain for the reasons described below.

As for the company management, the General Manager has an electrical engineering education and work experience, but he has no training or experience in commercial or financial areas or in corporate management of electric utilities. Consequently, he would benefit greatly from training in these areas. The aforementioned senior staff that is yet to be hired will in all likelihood require significant training. In recognition of the foregoing, NRECA has prepared an aggressive training schedule for all the utilities

during 2011.^{xxv} The assessment team have reviewed this and agree with NRECA staff that, while the training schedule is a necessary start, given employee skill levels, lack of on the job experience, attrition and the demands of currently open positions, **training should be ongoing well beyond the end of the T03 Project.** See also the discussion below under Paragraph 0.

3.2.10 Overall levels of staffing at YECO are insufficient for commercial operations. Meter reading, billing, and collections involve the entire staff for multiple days to the exclusion of their other duties. On the first of each month, the entire management and staff of YECO read meters. Bills are prepared and then delivered by the entire staff, after which members pay their bills in cash at YECO's office.^{xxvi}

3.2.11 YECO management reports that its US-manufactured equipment is not compatible with locally available equipment (connectors and meters were specifically mentioned). This may be a problem when replacing equipment or when expanding the system. Moreover, US-manufactured equipment is generally not available in a timely or cost-efficient manner because of small order sizes, long shipping routes, and high prices in general as compared to locally available equipment. **NRECA believes that a centralized procurement operation for the three utilities would go a long way toward removing the problem of costs and delivery times.**

3.2.12 A few accounting issues were discovered in YECO's accounting system and practices.

These were discussed elsewhere (see paragraph 0), but are mentioned here again as they relate to the issue of capacity. In particular, they are:

- **Inventory Accounting**—The assessment team observed that in March 2010 there was a onetime charge off of 159,000 SDG, which is an “adjustment” for items in the materials inventory that allegedly were over-counted in earlier accounts prepared by the company. This adjustment raises a serious question of internal controls (or lack thereof).
- **Fuel Inventory**—The assessment team has observed that fuel inventories are often stated as negative amounts, which is counterintuitive. While the explanation given—that invoicing from the supplier is late—is plausible, the average inventory does not appear to adjust for the lag over time. Moreover, when looking at amounts of fuel used in production, there are some large monthly variances, particularly in early 2010, that would suggest something is not being properly accounted for. Given the materials inventory adjustment that is mentioned above, it is possible that adjustments to the fuel inventory and fuel expenses recorded will be necessary. Certainly, the current accounting treatment is not correct.
- **Membership accounting**—the YECO by-laws require individual capital accounts to be maintained for each member, with surpluses and deficits being attributed to each account in proportion to the member's “patronage,” i.e. energy consumption. This is not being done.
- **2010 Year-End Closing**—YECO management does not yet know when or by whom their year-end closing will be performed. Until this is done, the company's financial statements cannot be prepared. The company's current accounting staff is not capable of performing the closing without outside help.
- As noted elsewhere, YECO does not have an outside auditor to prepare YECO's audited financial statements.

3.2.13 Three Board Members (President, Secretary, and Treasurer) have the power of officers, but they are not engaged in the daily operations of the business. The management role falls to the General Manager, but his authority is limited by the Board. For example, the positions of Financial Manager, Technical Manager, and Generation Supervisor are filled only with the approval of the Board, which undermines the authority of the immediate supervisor of their work, namely the General Manager.

3.3 Principal Findings Relevant Focus Area 3

Assess the level of management capacity likely to be in place in both YECO and electricity providers in Maridi and Kapoeta by the end of the project.

3.3.1 In YECO (as noted in paragraph 0), there are critical vacancies in the senior management of the company; **it is doubtful, even if these positions are filled, whether the level of competency needed to fulfill the jobs adequately will be in place before the end of the project.** The assessment team has also noted (paragraph 0) that existing staff need more training; whether the training that is planned will be sufficient is questionable for the reasons suggested by NRECA and mentioned elsewhere in this report. The problem is compounded in Maridi and Kapoeta.

3.3.2 In Maridi and In Kapoeta, by reference to the experience in the establishment of YECO, it can be inferred with a high degree of probability that these two utilities will require assistance for at least a period similar to that provided to YECO, and perhaps well beyond—particularly in the case of Kapoeta, due to the much smaller pool of potential candidates on which to draw.

3.3.3 Moreover, based on our observations in Kapoeta, the assessment team strongly concurs with Bob Dalton, who observed:

“Any company must walk before it can run. Staff require long-term training, not a 10-day course on theory they do not understand. We give basic rules for the linemen.... Later when they have developed an understanding of what electricity is, further training can be provided. These folks never used electricity before and now are expected to be ‘experts.’ It does not happen in one or two years. It first comes with working under a short list of safety rules.”

3.3.4 With respect to Kapoeta, NRECA is trying to adjust to local conditions, but long-term challenges will remain beyond the end of the project. Francis Mills responded to our questions on this subject, stating that:

There are challenges “. . . for the Boards as well as for both inside and outside workers. It takes four to five years to become a lineman in the USA; we are expecting these guys to be one in six months, and they do not understand ANY electrical theory—only Part A goes to Part B—because they told us so. Initially this will be expensive with the exception of the Board. Each system is too small to lose staff for extended periods of time, so the trainers will need to go to the sites. Board members should be trained outside their regions, thus insuring attendance.”

3.3.5 The assessment team concurs with both gentlemen, that **without proper assistance beyond 2011, both utilities’ survival will be problematic.**

3.4 Principal Findings Relevant Focus Area 4

Assess YEI government and community leader satisfaction with the cooperative management structure being utilized..

3.4.1 Community leaders are extremely satisfied with the YECO project and exhibit a real commitment to the continuing success of the project. In fact, in the case of the County Commissioner, it appeared that he is now counting on the utility's success for his continued popularity.^{xxvii} All the people the team met seemed to possess a profound, almost religious belief in the mission of YECO and a consequent dedication to the future of the utility.

3.4.2 The assessment team has no evidence (from interviews, document review, etc.) that the community leaders, the Board of YECO, or YECO's management understood the cooperative model as distinct from competing organizational structures. (Further evidence is discussed in 3.5.7)

3.4.3 The assessment team saw that economic activity in the town had expanded many-fold since its last visit in 2008. Multiple services were being provided by small entrepreneurs that did not exist in 2008. In connection with the growth in prosperity in the community, H.E. Col. David Lokonga, the Yei County Commissioner, made the following points:

- Yei has expanded very fast as a consequence of electrification; the town population has grown from some 80,000 to now around 217,000, while the County population stands at over 427,000.
- Because of the population increase, the demand for electricity is “enormous.”
- YECO has been a very beneficial project and people now expect these services, so sustainability is very important to the Commissioner.
- The Commissioner volunteered that there are challenges, but that they are being met. He maintained that the issue of hospital and street lighting payment arrears is “being resolved positively for YECO.”
- The Commissioner believes that the Board and the Management need further capacity training in utility management to meet the challenges of a growing community.

3.4.4 Other comments evidencing satisfaction and verbalizing the challenges being faced by the company and by the community came during the board meeting the Team attended. They were as follows:

- The benefits to the community are increased household income and increased security.
- According to the President of the Board, the main concern of the Board was sustainability as defined by two primary elements:
 - Tariff affordability, and
 - Sustainability by expanding to spread costs over a larger customer base.
- The President stated that revenue is just sufficient to cover operations and maintenance, and he maintained that the more connections YECO had, the more sustainable the operation would be.
- Problems identified by the Board were:
 - Overall costs are increasing,
 - Equipment is fast obsolescing, which is draining resources, and
 - Demand is increasing faster than the company can meet it.
- From a community planning point of view it is “crucial that services be rolled out to avoid crowding” in areas already served.
- The Board is hoping that USAID and the GOSS will help, as “the utility is too young to be left alone.”

- The Board wants training to understand the challenges associated with utility planning, governance, and management.

3.5 Principal Findings Relevant Focus Area 5

Assess the effectiveness of the methodology utilized by LBG/NRECA in assisting local government and community leaders in Maridi and Kapoeta to assess a variety of management options, and to select an appropriate management structure.

3.5.1 The assessment team found the process of selection to have been skewed in favor of the cooperative form of organizational structure. This is evidenced by the materials used to solicit the resolutions to establish Maridi and Kapoeta as cooperatives.

3.5.2 The main vehicle used by LBG/NRECA in assisting local government and community leaders to assess the variety of management options and appropriate management structures was the workshop handout entitled “Electric Utility Sustainability and Service Provider Options.” This document was used in presentations to large audiences of stakeholders in both Maridi and Kapoeta and was presented prior to voting on a resolution by the audiences as to the form of association that the utility should take. The resolutions in both locations supported the establishment of the respective utilities as cooperatives.

3.5.3 Five types of utility structures were presented as possible options. They were described as follows:

- “Government owned: WES prefers not to manage electric utilities. SSEC has had difficulties managing distribution operations in Juba.
- Non Government:
 - i. Cooperatives: user/member-owned, non-profit, private
 - ii. Local community user associations: village/district-owned, informal, non-profit
 - iii. Consumer-owned corporations: stock-owned, private, profit or non-profit
 - iv. Municipal and local government utilities: publicly-owned and administered”

3.5.4 The presentation then described each of the non-government types of structures, having dismissed government ownership based on the reasons cited in Paragraph 0 above. Each of the others was described as follows:

- “Cooperatives
 - i. Governance—Member-elected boards
 - ii. Capital Financing—Combination of members’ equity, government-facilitated financing, borrowing
 - iii. Management and Operations—Co-op employees
 - iv. Local participation—Substantial participation in all phases of utility formation, governance, and operation
 - v. Economic scale—Maridi is marginal, so enlisting a high level of community membership will be essential
- Local Community Users Associations
 - i. Governance—Village/tribal/district councils. These are mostly informal institutions that would likely not pass the test to be registered by the GOSS
 - ii. Capital Financing—Typically dependent on government support and donors
 - iii. Management and Operations—Locally-hired
 - iv. User participation—Similar to co-ops
 - v. Economic scale—Often very problematic.

- Consumer Owned Corporations
 - i. Governance—Shareholder-elected boards
 - ii. Capital Financing—Shareholders’ equity and borrowing (limited access to government financing)
 - iii. Management and Operations—Company-hired staff
 - iv. User participation—In theory, may be similar to cooperatives. In practice, limited to shareholders
 - v. Economic scale—Potentially constrained
- Municipal and local government utilities
 - i. Governance—Appointed or elected local government boards
 - ii. Capital Financing—Combination of central social funding programs and tax-exempt bonds
 - iii. Management and Operations—Local municipal/LGU-hired employees
 - iv. User participation—Limited
 - v. Economic scale—Yes”

3.5.5 The concluding slide on the issue of structure was entitled “What Makes Sense for Maridi,” and made the following arguments:

- “User associations are not likely to be considered for registration.
- [A] Private corporation is highly unlikely given the small market. USAID, WES, and GOSS would likely object to passing assets to private owner.
- Municipal utilities have worked in some environments, but are frequently challenged by mixing revenues with other municipal funds, low quality of service, difficulty hiring high quality staff
- Cooperatives are a workable solution but can only be formed if the community is fully supportive”

3.5.6 A vote of those present was then held, and the following resolution was passed in the case of each of Maridi and Kapoeta:

“Resolution 1. To form an Electric Cooperative.

Within the framework of achieving:

- A Reliable, competent, technically and commercially robust electric service provider;
- Ensuring a high degree of community participation in governance and decision making;
- Accessing government and donor funding for capital expansion of the electricity system through the State Ministry of Housing and Public Utilities and GOSS.

It is resolved to form an electric cooperative to serve the town of Maridi.”

3.5.7 In a meeting with the NRECA Project Manager in Juba on February 2, 2010, the Project Manager stated that he did not believe cooperative members understood fully how a cooperative actually worked and that the process of deriving a consensus on the form of organizational structure led to the selection of the cooperative model.

3.5.8 YECO is not currently fulfilling the obligations imposed by its cooperative structure. The by-laws are not being followed regarding the accounting for membership interests, and the current accounting system and software does not allow for such accounting.

3.5.9 The calculation of and the consequent value of a membership interest is not understood by the Board or the management, no less the members of the cooperative and the larger community as a whole. The process is complex and was not explained at any point in the selection of an appropriate utility structure. The by-laws, which define the method of calculation and which were meant to have been given out to members, have not been distributed, as noted elsewhere.

3.5.10 The process of calculating a membership interest is based on a member's "patronage" and is set forth in the by-laws as follows:

"Section 2. Patronage Capital in Connection with Furnishing Electric Energy. In furnishing of electric energy the Cooperative operation shall be so conducted that all patrons, members and non-members alike, will, through their patronage, furnish capital for the Cooperative. In order to induce patronage and to assure that the Cooperative will operate on a non-profit basis the Cooperative is obligated to account on a patronage basis to all its patrons, members and non-members alike, for all amounts received and receivable from the furnishing of electric energy in excess of operating costs and expenses properly chargeable against the furnishing of electric energy. All such amounts in excess of operating costs and expenses at the moment of receipt by the Cooperative are received with the understanding that they are furnished by the patrons, members and non-members alike, as capital. The Cooperative is obligated to pay by credits to a capital account for each patron all such amounts in excess of operating costs and expenses. The books and records of the Cooperative shall be set up and kept in such a manner that at the end of each fiscal year the amount of capital, if any, so furnished by each patron is clearly reflected and credited in an appropriate record to the capital account of each patron, and the Cooperative shall within a reasonable time after the close of the fiscal year notify each patron of the amount so credited to his account. All such amounts credited to the capital account of any patron shall have the same status as though they had been paid to the patron in cash in pursuance of a legal obligation to do so and the patron had then furnished the Cooperative corresponding amounts for capital."

3.5.11 The by-laws of YECO also would seem to impose the requirement that members contribute additional capital if their capital accounts go negative. Certainly the mechanism is there that could impose that, and the imposition would be logical if the utility were not meeting its revenue requirements and was generating continuous losses. The by-laws themselves, however, do not explicitly cover the case where losses attributable to a member exceed the member's capital account value.

3.5.12 In a meeting with the Minister of Energy and Mining, both he and Samuel Taban, Director General of Generation Planning and Supply, stated that if the Market Town Utilities were organized as corporations, they would fall under the Ministry's mandate.¹⁰ But since they are cooperatives, they fall under the responsibility of the Ministry of Cooperatives and Rural Development.¹¹ This has implications for the budgeting of subsidies to the cooperatives in Yei, Maridi, and Kapoeta. This also has implications for the planning and integration of these utilities into the electricity grid in the future.

3.5.13 The Cooperative Societies Provisional Order of 2011 mandates that all current cooperatives have to be re-registered immediately, pursuant to the requirements in the Order. Thus the registration process for YECO will have to be done all over again should the utility wish to maintain its current cooperative status.

¹⁰ One of the arguments that have been advanced for a cooperative model, and against a corporate form of organization, is that a company would have to show a profit, thus further stressing the affordability of the services provided. But an entity in corporate form does not have to include a profit—it can be a non-profit corporation, in which case the organizational form has no impact on the tariff. (The Ugandan transmission company is structured as a corporation, and the government there made a policy decision in 2003 to set its return on assets to zero.) In fact, the current tariff design for the Market Utilities does have the equivalent of a profit included in its design but that is entitled a "net margin," and which is designed to be retained like earnings and used for expansion and replacements. The assessment team's primary point in emphasizing a corporate form over a cooperative form is that, organized as cooperatives, the Market Town Utilities would appear to be disadvantaged insofar as they are not under the purview of the Ministry of Energy and consequently may have more trouble receiving funding support from the GOSS and being incorporated into overall system planning.

¹¹ The Assessment Team did not meet with the Ministry of Cooperatives and Rural Development. The Minister of Cooperatives died the day before the team planned to meet with a representative of that Ministry. However, a representative from the Ministry of Cooperatives who later attended the Government Outbrief agreed that the utilities fell under their remit.

3.6 Principal Findings Relevant Focus Area 6

Assess the anticipated level of sustainability of cooperatives in Maridi and Kapoeta under a YECO-style cooperative structure, including an assessment of assumptions utilized, (i.e. willingness to pay) and key risk factors.

Nature of Small Isolated Utilities

- 3.6.1 The SISP Market Town Survey Report summed up the challenges to sustainability in Maridi and Kapoeta as follows: “They are both smaller towns with less economic activity [than Yei]; they both have lower population density; they both appear to have higher product costs; they both have fewer and less well-developed NGO communities; and they both have less developed infrastructure for supporting project implementation.”
- 3.6.2 The Survey went on to note that, “[t]he most problematic issue to be addressed, as noted earlier, is the post-construction management of the electric utility systems that are financed and built.”
- 3.6.3 **Our findings support these statements of risk that have been assumed in the construction and operations of these projects.**
- 3.6.4 The very nature of the small service providers in Maridi and Kapoeta (independent of their organization structure) provides risks to sustainability:
- Cost structure—the use of small diesel generators result in very high generation costs (fuel costs alone would be around 1.00 SDG/kWh for YECO at current fuel market prices). This drives overall operating costs up against affordability limits without generating funds for replacement and system expansion.

The operating results anticipated for Maridi and Kapoeta were described in NRECA’s 2008 assessment reports^{xxviii}:

“Conversion efficiency of diesel generators is fairly flat at loads that exceed 70% of the rated output of the generator, but very steep at loads below 70% of rated capacity. Experience shows that most remote generators are not well-matched to suit loads; most are oversized, and many are dramatically so. While generators that are well dimensioned to meet load may operate at up to 32% overall thermodynamic efficiency, many isolated generators operate in the range of 15–20% efficiency. In these and past studies, assumed generator efficiency is estimated to be 20% for purposes of evaluating initial levels of energy use. This is roughly equal to 2 kWh per liter of diesel fuel.”

This would put the Maridi and Kapoeta’s fuel costs at very high level—around 1.75 SDG per kWh at current market diesel prices, based on the original NRECA assessment. Fortunately, however, **the actual operating results in Yei are much better, averaging around 3.5 kWh per liter of diesel fuel for 2010.** Hence, NRECA’s assumption regarding thermodynamic efficiency of the generators in Maridi and Kapoeta were rather conservative, and thermodynamic efficiency and fuel consumption per kWh are expected to be similar Yei.¹²

¹² For the record, the assessment team believes that the generating units installed are appropriately sized and provide both sufficient redundancy/reliability for system stability and capacity for system expansion. The assessment team’s statements regarding cost of production relate to the fact that by their very nature small, diesel fuel and fuel-oil fired generating plants such as those operated in Southern Sudan result in high cost power generation, especially when capital-related costs are taken into account.

- **Tariff**—given the cost structure of the small utilities, when power is supplied by diesel generators, cost of service tariffs approach or exceed the affordability limits in the communities they serve. Maridi’s 2011 energy charge is 1.38 SDG per kWh (1.73 SDG per kWh without USAID’s funding), and Kapoeta’s 2011 energy charge is 1.57 SDG per kWh (1.70 SDG per kWh without USAID funding). These compare to the SSEC tariff in Juba of 0.50–0.70 SDG per kWh (including subsidy by GOSS) and compares to the tariffs in Uganda of around an equivalent of 0.40—0.50 SDG per kWh without subsidies. **The underlying costs result in electric bills that are at the affordability limits delineated in LBG’s baseline assessment reports for Maridi and Kapoeta.**
- **Small staffs**—the planned staffing levels are very low for Maridi and Kapoeta, with 15 people planned initially for each utility.^{xxix} The limited staffing results in the risk of the utility experiencing operational issues if and when key staff members experience extended illnesses, resign, or leave the company for other reasons. Of the 18 original employees in YECO, the Assessment Team was told that only 11 remain.^{xxx}

3.6.5 In a meeting with the team, the Minister of Energy and Mining stated that he doubted the viability of the utility at Kapoeta because of the nature of the community being served; the Minister specifically questioned the financial sustainability of Kapoeta utility because of the community’s high unemployment rate, the lack of economic activity in general, and the nomadic lifestyle of many of its residents.

3.6.6 The cooperative structure imposes an additional level of complication on the utilities in Maridi and Kapoeta that:

- Obviates their ability to offset the high operating costs with budgetary support from the Ministry of Energy and Mining or to be integrated into the system expansion plans as they will evolve under the aegis of the Ministry, and
- Imposes additional accounting and record-keeping requirements on the small staff.

Expansion and Replacement of Equipment

3.6.7 In the document entitled “Kapoeta Electric Cooperative, Initial Set of Electricity Tariffs and Fees,” item 2.3 reads:

“Since the electric system (generation, distribution, and general) was donated by the United States Agency for International Development (USAID), depreciation was not included as an expense. Rather, another allowance for extensions and recurring replacements and repairs of most major items of equipment is included as a cost of service. This allowance is identified as “Net Margin.””

Hence, the net margin is meant to be accumulated and used to fund system extensions and replacements of major items of equipment rather than an explicit replacement/expansion reserve being created.

3.6.8 In the document entitled “Maridi and Kapoeta Tariff Assumptions,” item 2 reads:

“Tariffs are to be set so as to cover all budgeted costs not covered by USAID plus a 5% net margin, which is designed to increase the likelihood that the utility will be self sustaining.” The “Net Margins” in the Maridi and Kapoeta budgets for 2011 are projected to be 40,000 SDG and 100,000 SDG, respectively.^{xxxi} **The budgeted Net Margins are substantially below the amounts estimated by the assessment team at around 400,000 SDG per year that are needed for replacement in each of Maridi and Kapoeta, without consideration for expansion of those systems.**

3.6.9 YECO has not been able to generate internal funding (from “Net Margin”) for expansion or to create a Replacement Reserve fund, and the cooperatives in Maridi and Kapoeta are heading toward a similar set of financial sustainability challenges.

Other Considerations

- 3.6.10** Given YECO's experience with willingness to pay, it is unlikely that the cooperatives in Maridi and Kapoeta will be affected by the risk of non-payment. The cooperatives in Maridi and Kapoeta are taking an allowance for doubtful accounts amounting to 5% of revenues. This has proved to be sufficient to cover bad debts in YECO. As mentioned above, however, there are affordability constraints that limit the amount that tariffs can be increased, which in turn could affect sustainability if diesel fuel prices continue to rise.
- 3.6.11** **The fact that the cooperatives at Maridi and Kapoeta, like YECO, are in the portfolio of the Ministry of Cooperatives and Rural Development will work against their ability to obtain budget support from the Ministry of Energy and Mining. Nor are they likely to be taken into account by the MEM when planning for system expansion.**
- 3.6.12** **In Maridi, applications for membership and connections are exceeding NRECA's original estimates.** In addition, NRECA's project manager for Maridi reports that a Spanish consortium is studying the possibility of building a fruit juice and beverage factory in Maridi requiring 380 kW of power. Hence, it is clear that the Maridi utility will have broader demand for service than was assumed in LBG/NRECA's 2008 assessment reports.^{xxxxii}
- 3.6.13** **The outlook in Kapoeta is less clear, as the utility's development has been slower and the environment is more challenging** economically than Maridi's. The utility had only 38 connections as of 11 February 2011, with several dozens of applications being processed. No new major additions to the community were reported likely in the near future, however, save for WFP moving some of its operations from Lokichoggio. Moreover, traffic from Kenya has declined since the new paved road from Uganda has opened up, with transport operators opting for the longer, but less demanding, route from Kenya through Uganda. Finally, several recent security problems have occurred in the area, damping transit between Torit and Kapoeta. Hence, it is unclear at the time of this writing whether it is probable that the demand for service will reach the level projected in LBG/NRECA's 2008 assessment reports.
- 3.6.14** **In the long run, the utilities in Maridi and Kapoeta will need to replace their high-cost power generation units with lower cost alternatives** (e.g., connection to future grid), which will require cooperation with the SSEC¹³. Under the new Southern Sudan Electric Company Provisional Order, SSEC is responsible for all power generation and transmission in Southern Sudan.
- 3.6.15** **The assessment team has observed that there may be a preference for hiring people from the local community over promoting and/or training existing personnel** who are not from the area being served. As a matter of revenue protection, the opposite practice is preferred, i.e. bringing in people from the outside in order to insulate the commercial discipline of the utility from pressures that might otherwise undermine it. Also, the assessment team has noted that it is difficult to source qualified people from the local community: this may explain why so many critical positions are open at YECO.

¹³ Since the SSEC is responsible for all generation in Southern Sudan according to the Provisional Order, the assessment team believes it makes sense for the Market Town Utilities to work with SSEC if they wish to avail themselves of more reasonably priced power in the medium term. This form of partnership is commonly referred to as a type of public-private partnership, and per the Provisional Order it will necessitate the development of a close working relationship with the SSEC.

4. PRINCIPAL CONCLUSIONS

4.1 Principal Conclusions with Respect to Focus Area 1

Assess the current and projected levels of financial sustainability of YECO.

- YECO covered its operating costs and was cash-flow positive for 2010, but the assessment team concludes that this state of affairs is temporary, and the sustainability of the utility will be severely tested when the utility is forced to pay current market prices for fuel, when it is fully staffed, and when it adequately provisions for the replacement of equipment. Assuming that these issues are addressed through the provision of external finance, some of the current funds on the books of the company could be used to finance system expansion, but prudence would dictate only under this condition, and only against the development of capital budgets.
- On the issue of depreciation, the assessment team believes that a prudent planned lifetime for system replacement in the current environment would be 10 years, particularly in light of the fact that one of the gensets in YECO has already experienced a prolonged unscheduled service interruption, necessitating offsite repair.
- We found that revenue requirements to achieve full cost recovery would be 21 percent higher if adjustments are made for:
 - Increase in payroll by filling critical vacancies, and
 - The current market price of fuel.
- These revenue requirements imply an increase in the tariff to 1.81 SDG/kWh, which may well be above the affordability limit and is far from the target tariff set by the Board of 0.75 SDG/kWh.

4.2 Principal Conclusions with Respect to Focus Area 2

Assess YECO's current technical, financial, and commercial management capacity and its ability to meet ongoing capacity development needs..

- The excellent training provided so far needs to be continued. Training in all aspects of management should be ongoing well beyond the end of the Task Order 3 (T03) Project (September 2011).
- Management needs assistance in completing the job of setting up the company:
 - The company's 2010 books need closing;
 - Equity accounts need to be set up and maintained for members—this requires new software;
 - Internal control systems and procedures need to be established;
 - Job descriptions need to be written; and
 - An audit needs to be conducted for FY 2010.

4.3 Principal Conclusions with Respect to Focus Area 3

Assess the level of management capacity likely to be in place in both YECO and electricity providers in Maridi and Kapoeta by the end of the project.

- Management Capacity sufficient for the tasks at hand and as they will evolve is absent. Without management leadership and training assistance beyond 2011, the utilities' survival will be problematic, particularly in Maridi and Kapoeta.

4.4 Principal Conclusions with Respect to Focus Area 4

Assess YEI government and community leader satisfaction with the cooperative management structure being utilized..

- Everyone the team met possessed:
 - A profound, almost religious, belief in the mission of YECO and
 - A consequent dedication to the future of the utility.
- Whatever organizational structure that is finally settled upon, it needs to be completed and explained to all stakeholders. This has not been successfully done to date. Neither the Board, nor Management sufficiently understand what a cooperative is from a legal and accounting point of view. The lack of understanding carries with it the possibility of later stakeholder disillusion.

4.5 Principal Conclusions with Respect to Focus Area 5

Assess the effectiveness of the methodology utilized by LBG/NRECA in assisting local government and community leaders in Maridi and Kapoeta to assess a variety of management options, and to select an appropriate management structure..

- The assessment team believes that process was skewed in favor of the cooperative form of organizational structure.
- The fact that cooperatives do not fall under the mandate of the Ministry of Energy could have serious implications for the utilities' ability to access lower-cost power.

4.6 Principal Conclusions with Respect to Focus Area 6

Assess the anticipated level of sustainability of cooperatives in Maridi and Kapoeta under a YECO-style cooperative structure, including an assessment of assumptions utilized, (i.e. willingness to pay) and key risk factors..

- The ability of Maridi and Kapoeta to survive will depend for years to come on the continued provision of external managerial assistance as well as capacity building of staff through ongoing training. Finally, the assessment team believes external budgetary support will be necessary to maintain sustainability.
- The YECO-style cooperative structure may limit the utilities' integration with the planned electricity system for Southern Sudan because the structure causes the utility to be outside the mandate of the MEM.

5. RECOMMENDATIONS

This section provides summaries of our conclusions, incorporating them into the three specific recommendations requested by USAID in the Scope of Work. For purposes of clarity, as defined throughout this assessment, the short term is defined as that period falling within a 12-month planning horizon; the medium term is defined as from one to three years; and the long term is deemed to be more than three years.

5.1 Principal Conclusions Relevant to Recommendation 1

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- i. **Conclusion:** No technical, managerial, or rate changes are available that would address the financial sustainability gap identified. The financial sustainability gap is generated by the need for a replacement reserve in an amount equal to the depreciation of the capital equipment portion of the grant that set up each of the utilities. This amount is augmented by the need for an increased payroll in the case of YECO; and also each of the utilities will be further stretched by increasing fuel costs that will push tariffs over the assumed levels of affordability. Moreover, there are no commercial sources of financing available in Southern Sudan at this time, nor are there likely to be for the next two to three years at best.^{xxxiii} Nor will USAID's Development Credit Authority mechanism be likely to work in the absence of commercial banks willing to lend in the first place.^{xxxiv}

The foregoing sustainability gap speaks only to current operations. The ability to fund system expansion in the three Market Utilities is completely outside existing resources at this time unless further budget/donor money is found.

- ii. **Recommendation:** Equipment will wear out and must be replaced. Budgetary support from the states and from the GOSS central budget should be arranged in amounts at least equal to the annual amortized amount of the donor's (USAID in this case) contribution to the utilities capital equipment. This is most often done in other countries through a Rural Electrification Fund, the moneys for which come from a levy on grid-connected customers. In Sudan's case, the only viable source of funding available at this time would come as a direct line item from the respective state and central government budgets. The assessment team found that H.E. Boutros Magaya, Minister for Physical Infrastructure and Public Utilities, Western Equatoria State, fully supports this approach in the case of Maridi and is willing to use his office as a platform from which to educate the other governors to become similarly engaged in the fate of the utilities. The assessment team strongly recommends that he be supported in this effort.
- iii. **Recommendation:** The assessment team recommends that system expansion be facilitated (through a Rural Electrification Fund) as soon as possible. The unserved customers will put increasing pressure on the utility to expand. In order to do so, the utility must bring its costs down as soon as possible. The team sees definite political and commercial risks if there is an appreciable delay in meeting unserved customer demand.

5.2 Principal Conclusions Relevant to Recommendation 2

If significant management capacity gaps are likely to remain upon the completion of the project, provide recommendations for cost-effective and sustainable means to meet medium and long term capacity development requirements..

- i. **Conclusion:** While training of staff has been significant and the positive results of this training are visible, significant management capacity gaps will continue to exist, both because of capacity issues with current management and because certain line positions are vacant (as in the case of YECO). These have been recognized and LBG/NRECA have planned an aggressive training program for the balance of 2011. The assessment team has reviewed that program and find it adequate in the short term for the needs of existing staff. In the medium and long term, continued support will be needed.
- ii. **Recommendation:** In the medium term, the Assessment Team believes that the Market Utilities should take advantage of training offered by Uganda Electricity Distribution Company, as well as by Kenya Power and Light. The Assessment Team recommends that USAID and NRECA jointly develop and supervise a medium-term support program that takes advantage of local training resources.
- iii. **Recommendation:** In meetings with the SSEC, it is apparent that there is strong support for the development of a centralized Sudanese utility training institution. The assessment team recommend that such an institution's establishment be encouraged and supported by USAID with assistance/input from NRECA.

5.3 Principal Conclusions Relevant to Recommendation 3

If the current cooperative management model is inappropriate or incomplete, the assessment team should provide recommendations and detailed examples of alternate management structures that could be utilized to overcome sustainability constraints and that are likely to succeed within the southern Sudan context..

- i. **Conclusion:** There are no alternative management structures that could be utilized to overcome sustainability constraints. Sustainability is a function of economic viability, not a function of organizational structure. The assessment team does believe, however, that the current structure creates an administrative burden that is unwieldy and unnecessarily complex; the team also believes that the cooperative form of organization will limit the utilities' ability to be integrated into the development of the Sudanese electric sector, as planned by the Ministry of Energy and Mining.

The fact the utilities have been set up in cooperative form means that they fall under the authority of the Ministry of Cooperatives and Rural Development where they will not enjoy the leadership and support they might otherwise receive were they set up as shareholding companies, in which case they would be supported by the Ministry of Energy and Mining.

- ii. **Conclusion:** People like the sound of the word "cooperative," but they do not understand what a cooperative is. Moreover, the low cost loans and low cost power supply offered by the US Government to the US rural distribution cooperatives, which contributed to their success, are not and will not be available in the Sudanese context. This absence has the potential to create dissatisfaction among all the stakeholders at some point in the future when they realize that, as members, they may be required to further contribute to the cooperative's capital structure in the absence of external financing.
- iii. **Recommendation:** The Assessment Team recommends that the utilities be re-established as joint stock companies owned by their customers, the effect of which will be to limit the liability of the customer/shareholders to the capital they contributed; it will also facilitate partnering in public private partnerships with the government and the SSEC, and most importantly, it will have the beneficial effect of transferring the entities out from under the Ministry of Cooperatives and Rural Development, thereby having

them come into the portfolio of the Ministry of Energy. Finally, it would make the administration of the entities far less complex.

6. PRINCIPAL CONCLUSIONS AND RECOMMENDATIONS RELEVANT TO USAID REQUESTS FOR VERIFICATION

USAID wished to verify the current state of operations and suitability of the YECO utility model including:

The process undertaken to select a cooperative structure in Mardi and Kapoeta

Conclusion: The assessment team believes the process was skewed, as discussed in Section 3.5 of this report.

The suitability of this model for achieving the goal of a sustainable provision of electricity

Conclusion: The cooperative model is unnecessarily complex, but the critical issue is whether the utilities' full cost of service, including replacement costs of capital equipment, is factored into the calculation of sustainability and how that deficit will be met.

Alternative models that could be used with a high degree of certainty within the Sudanese context

Recommendation: The assessment team would advocate incorporation of the utilities as joint stock companies owned by their customers and then working to structure public-private partnerships with the SSEC for their generation planning and development needs. Certainly, their survival in the medium term demands such a partnership, as lower cost generation is a prerequisite going forward.

Additional assistance that may be needed over the medium to long term to ensure the management capacity and access to credit and/or government funds needed to sustain and expand operations is available.

Recommendations: The assessment team recommends that USAID support directly or recommend to the MEM that they pursue independently, or with funding from other donors, the following programs and policies:

- i. Establish a Rural Electric Development program (supplying both funding and creating/supporting an agency to administer it) to expand rural electrification and to moderate, i.e. help bring down, tariffs where they exceed affordability limits. The Market Town Utilities should initially be the focus of this program, both to cope with their sustainability challenges and to fund system expansion. The Rural Electrification fund would thus ideally cover both full cost recovery and system expansion needs.
- ii. Establish a policy for the GOSS and the state governments to provide budgetary support to the Market Town Utilities (either directly or preferably through the Rural Electrification Fund) in sufficient amounts to accumulate a replacement fund and expand their distribution systems. This subsidy will be needed until such time as the utilities' cost of service is lowered either by the government or a donor developing lower-cost generation capacity for the utility, or the SSEC connecting the utilities to a grid providing lower-cost power supply.

- iii. Prepare a Master Plan for the development of the electric sector in Southern Sudan. This work should be performed by international experts with technical, commercial, and regulatory experience and expertise in the electric sector.
- iv. Provide technical assistance to the MEM and SSEC in reorganizing the institutional framework, building management and operational capacity in electric institutions, and developing the physical infrastructure for the electric sector in Southern Sudan as provided in the Master Plan.
- v. Pursuant to the Master Plan, develop least-cost power generation alternatives for the country as a whole. Since a substantial portion of cost of service for the SSEC and the Market Town Utilities (as well as the soon-to-be-formed utilities for the state capitals) is associated with generation, this should allow the utilities to lower their tariffs, reduce or eliminate subsidies, and establish financial sustainability.
- vi. Establish an electric utility training institution in Sudan. The classes and on-the-job training would need to range from basic use of power tools to installation of electric wiring and to management and operations of electric utilities. Initially, the training and capacity building program could be conducted in cooperation with utilities in Kenya and Uganda, until the training institution is established in Sudan complete with experienced training instructors.
- vii. Establish a small and medium enterprise (SME) lending program focused on utility customers that would enable customers to finance refrigeration and electric operating and production equipment. This would assist the customers to increase their productivity and enhance their quality of life, as well as helping the utilities build load (thereby increasing revenues) within their existing distribution base.

ANNEX I: INTERVIEW LISTING

Interview 1: H.E. Samuel Taban Youziel, Director General, Power Planning and Supply, Ministry of Energy and Mining

Interview 2: YECO, Michael Malis, General Manager

Interview 3: YECO, Office Staff

Interview 4: H.E. Col. David Lokonga Moses, Commissioner, Yei River County

Interview 5: YECO Board of Directors: Samuel Taban J. Kilombe, President; Arkangilo Wani Lemi, Vice President; Monday Hellen, Board Secretary; Salah James, Board Treasurer; as well as Board Members Cosmos Luate, Bullen G. Wani, and Lomude Nixon Allahjabu

Interview 6: YECO Staff Meeting—Swalleh Rajab, CIS Consultant to YECO, NRECA; Betty Lamunu, Accountant; Hakim James, Overhead Line Supervisor; Gita Felix Wani, Lineman Crew Supervisor; Mandella Samuel, Generator Plant Operator

Interview 7: YECO Board—Dinner

Interview 8: Tesfamichael Nahusenat Mititku, World Bank—Sudan

Interview 8: Robert Laliberte—Deloitte Consulting

Interview 10: Prof. Ajuoi Magot Chol, Chairman and General Manager, Southern Sudan Electric Corporation and Eng. Beck Awan Deng, Director General for Planning and Projects, Southern Sudan Electric Corporation

Interview 11: Samuel Taban John, Maridi Stakeholder

Interview 12: H.E. Garang Diing Akuong, Minister of Electricity and Mining

Interview 13: Boutros Magaya, State Minister for Infrastructure, Western Equatoria State

Interview 14: Francis Mills—NRECA Project Manager—Kapoeta and Stephen Okeny Rumamoi, Director Community Relations, NRECA

Interview 14: Jacob Longwa, Executive Director, South Kapoeta County

Interview 15: Paul Marin Lorika, Commissioner, South Kapoeta County

Interview 16: Bruce Pike, Director, New Sudan Service and Supply, Kapoeta

ANNEX 2: DOCUMENT REFERENCES

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Maridi and Kapoeta Documents

- NRECA, “Maridi Power Project Review,” 28 September 2010
- NRECA, “MARIDI PROJECT REVIEW PRESENTATION,” undated
- NRECA, “Maridi Market Town Workshop, Electric Utility Sustainability & Service Provider Options,” undated
- NRECA, “ELECTRICITY AWARENESS WORKSHOP FOR RESIDENTS OF KAPOETA,” OCTOBER 2010
- NRECA, “KAPOETA STAKEHOLDERS WORKSHOP, JUNCTION INN, KAPOETA, SOUTHERN SUDAN,” 18—19 OCTOBER 2010
- NRECA, “KAPOETA WORKSHOP, KAPOETA POWER PROJECT REVIEW,” undated
- NRECA, “Kapoeta Market Town Workshop, Electric Utility Sustainability & Service Provider Options,” October 2010
- NRECA, List of resolutions passed during Kapoeta stakeholders meetings, undated
- NRECA, Letter to Eng Samuel Taban Youziel, Director General, Ministry of Energy and Mining, Subject: Sudan Infrastructure Services Project—Task Order 3 Market Town Electrification, Maridi Electric Cooperative—Proposed Tariff Rates, dated 24th October 2010
- NRECA, Letter to Eng Samuel Taban Youziel, Director General, Ministry of Energy and Mining, Subject: Sudan Infrastructure Services Project—Task Order 3 Market Town Electrification, Kapoeta Electric Cooperative—Proposed Tariff Rates, dated 24th October 2010
- Kapoeta Electric Cooperative, Initial Set of Electricity Tariffs and Fees, undated
- NRECA, “Maridi and Kapoeta Tariff assumptions,” written description of assumptions used in preparing budget for tariffs, undated
- NRECA, Maridi and Kapoeta Initial Tariffs—Payroll assumption, undated
- NRECA, Kapoeta First Year Preliminary Budget (2011), worksheet used in preparation of Kapoeta Tariff, undated
- NRECA, Maridi First Year Preliminary Budget (2011), worksheet used in preparation of Maridi Tariff, undated
- Email from Brieon Marais to Tom Sherwood & Gary Fullerton, containing equipment costs for Maridi, dated February 17, 2011
- Email from Laban Kariuki to Tom Sherwood & Brieon Marais, containing electricity sales in Kapoeta during January 2011, dated February 10, 2011

ANNEX 3: BACKGROUND OF THE AUTHORS

Thomas J. Sherwood: Mr. Sherwood's experience includes leadership roles in structuring energy sector investments in Africa, the Middle East, and Eastern Europe; arranging international project finance; and managing and reforming complex energy company operations in transition from state to private ownership. Mr. Sherwood has served in senior positions, including the Chairman of the Transition Committee of the Board of Directors and Deputy-CEO of Jordan's Central Electricity Generating Company; Resident Project Manager to the Ugandan Ministry of Finance on the successful restructuring and privatisation of the electric power sector of Uganda; Transaction Advisor to the Minister of Energy of Kosovo; and Financial Director of the United Distribution Companies of Georgia. Mr. Sherwood has spent over 25 years living and working in West, Central, and East Africa, Southeast Asia, the Middle East, the Caucasus, and Central and Southern Europe. Mr. Sherwood has an undergraduate degree in Industrial Engineering and an MBA in Finance, both from Columbia University.

Gary D. Fullerton: Mr. Fullerton has over 35 years' experience in energy and infrastructure project financing and development; advising governments on PPP policies, programs, and projects; advising governments on restructuring state-owned utilities as private sector companies; and performing feasibility studies for energy and infrastructure programs and projects. For a number of years, Mr. Fullerton was Vice President of Bechtel Enterprises, the Bechtel Group's financing and investment affiliate, with responsibility for the Group's power and infrastructure investments in North Africa, the Middle East, and Turkey, and which included a number of independent power plants. During this period, he also advised the government of Saudi Arabia on the creation of Marafiq, the power and water utility for the industrial cities of Jubail and Yanbu. He also served as Chief of Party for USAID's privatization program in Egypt. Mr. Fullerton has lived and worked in the Middle East and North Africa for most of the last 20 years, and has work experience in Europe, Sub-Saharan Africa, Asia, and Latin America. Mr. Fullerton has a BA in Economics from the University of California, Santa Barbara, and an MS degree from the Haas Business School at the University of California, Berkeley.

ANNEX 4:ASSESSMENT CALENDAR

Day	Date	City	Activity	Location & Time	Tasks/Notes
Tue	1-Feb	Arrive Juba	Team Planning Meeting Day 1	MSI 2:00-5:00	Consultants and MSI
Wed	2-Feb	Juba	Team Planning Meeting Day 2	MSI Time 9-12	Consultants, USAID, LBG,NRECA International, GOSS/MEM and MSI; afternoon meeting with TO3 team (Laban and James) re: stakeholder consultation workshops
Thu	3-Feb	Juba, Drive to Yei	Meeting (A.M.) and travel (P.M.)	9:00 - 5:00	AM - 9-10 meet with Samuel Taban MEM; PM - travel to Yei (4 hours) - depart Juba 11 AM, meeting Project Manager and team on arrival
Fri	4-Feb	Yei, Central Equatoria	Meetings	MSI 9:00 - 5:00	AM - meet Commissioner first, YECO Board members; beneficiaries; and other stakeholders (Laban is organizing this)
Sat	5-Feb	return to Juba	Meetings in the morning and travel back to Juba	MSI 9:00 - 5:00	TDB: additional YECO board members, beneficiarier, and other stakeholders (Laban is organizing this)
Sun	6-Feb	Juba	OFF		
Mon	7-Feb	Juba	Meetings	9:00 - 5:00	
Tue	8-Feb	Juba	Meetings (A.M.)	9:00 - 5:00	PM: 1:00 mid-point meeting with USAID (David Gosney). 2:00 Mid-point check at MSI(Ingrid)
Wed	9-Feb	Juba	Meetings	9:00 - 5:00	AM: 10-11 meet w/ Tesfimichael (World Bank/0955322004) at MSI; PM - Meet with SSEC General Manager (2 PM) at SSEC office. Evans will meet rest of team at MSI at 1:30 to travel together to SSEC office
Thu	10-Feb	Juba	Meetings	9:00 - 5:00	Meetings with Taban John (Maridi Stakeholder at 10:00 AM); Laban (NRECA) at 2:00; and at 5:00 PM meeting with Deloitte
Fri	11-Feb	Juba	Meeting (A.M) orgnise notes (P.M)	MSI 9:00 - 5:00	Submit initial findings, conclusions, recommendations to MSI (based on field work conducted so far) for review and comment by Ingrid
Sat	12-Feb	Juba	Organise notes		Meeting Swale (NRECA) time 2:30 - 3:30 PM
Sun	13-Feb	Juba	OFF		
Mon	14-Feb	Juba	Meetings	9:00 - 5:00	Follow up meetings: Meeting with GOSS Minister (MEM) at 9:00 AM; meet Eastern Equatoria State Minister of Housing and Public Utilities (11:00 AM);
Day	Date	City	Activity	Location & Time	Tasks/Notes
Tue	15-Feb	Juba	Meeting and then fly to Kapoeta (A.M.) meeting (P.M.)	9:00 - 5:00	Meet with Boutros Magaya (WES State Minister for Physical Infrastructure) at 9:15 before flying to Kapoeta; meet local authorities in Kapoeta -
Wed	16-Feb	Kapoeta, Eastern Equatoria State	Meetings	9:00 - 5:00	Other partners; and beneficiaries
Thu	17-Feb	Kapoeta, Eastern Equatoria State	Fly back to Juba (A.M.) meeting (P.M.)	9:00 - 5:00	time to pull notes together (individually or as a group)
Fri	18-Feb	Juba	Drafting Findings, Conclusions, Recommendations	MSI 9:00 - 5:00	Tom and Gary draft findings and general conclusions, etc. - preparation for workshop day
Sat	19-Feb	Juba	Drafting Findings, Conclusions, and Recommendations	Time TBD	Tom and Gary continue to review data gathered, what conclusions they have drawn and what recommendations they would like to make. This should be documented in the approved report outline format - this should be sent in draft form to MSI for review - possibly meet with Ingrid when she returns Sat afternoon (or Sunday)
Sun	20-Feb	Juba	OFF		
Mon	21-Feb	Juba	Drafting Findings, Conclusions, Recommendations Workshop	MSI 9:00 - 5:00	Entire team reviews findings (making sure to identify any remaining gaps in evidence and how to fill them), review general conclusions, etc,
Tue	22-Feb	Juba	Report drafting	MSI 9:00 - 5:00	Tom and Gary continue to work on report drafting and prep for presentation/debrief
Wed	23-Feb	Juba	Report drafting	MSI 9:00 - 5:00	Tom and Gary continue to work on report drafting and prep for presentation/debrief
Thu	24-Feb	Juba	USAID Internal Debriefing (9:00 - 11:00 A.M.) and preparation for Presentation to Govts (P.M.)	MSI 9:00 - 5:00	Tom and Gary give debriefing to USAID - Place: USAID office - first floor conference room; time: 9:00 - 11:00 AM. PM - Tom and Gary prepare for govt presentation
Fri	25-Feb	Juba	PRESENTATION to GOVT(S) A.M. and submit the final draft (P.M)	MSI 10:00 - 5:00	Tom and Gary give presentation to GOSS - place MSI -time 2:30 - 4:00. PM - Exit interview with Ingrid and turn in draft report for any other comments
Sat	26-Feb	Juba	Report drafting	Time TBD	Incorporate in the draft any issues raised in Friday presentation.
Sun	27-Feb	Juba	OFF		Extra time to complete final draft
Mon	28-Feb	Juba	TRAVEL TO HOME BASE	In transit	AM - Submit final report draft. Total LOE 26; (TL): 3 days additional LOE preparation of the final report.
Tue	1-Mar	Juba		In transit	
Wed	2-Mar			In transit	

Note: The calendar shows principal activities as they actually occurred (which, in some cases, differed slightly from as originally planned). Only activities during the in-country period are shown.

ANNEX 5: SCOPE OF WORK

Assessment of the Yei Electric Cooperative Organization (YECO) Utility Model

(Proposed time frame: mid January – mid February 2011)

1. Sudan and Sector Context

Sudan is a leading country for U.S. foreign assistance in sub-Saharan Africa, and one of the U.S. Government's highest foreign policy priorities. Sudan's 2005 Comprehensive Peace Agreement, reached after decades of civil war, attempts to address regional disparities between underdeveloped regions and the capital, Khartoum. USAID/Sudan's primary goal is to promote the implementation of the peace agreement.

Among other things, the Comprehensive Peace Agreement (CPA) provides for a 6-year interim period during which southern Sudan is to be governed by an autonomous entity called the Government of Southern Sudan (GoSS). After the interim period, southern Sudan will decide in a referendum whether to become independent or to continue as a self-governing component of a unified Sudan. USAID's broad range of programs in southern Sudan is intended to support the implementation of the CPA, with a long-term goal of assisting the peaceful and democratic transformation envisioned by the framers of the CPA.

Historical underdevelopment, followed by decades of war and neglect, has left southern Sudan with minimal infrastructure. Electric service in Southern Sudan exists in few communities, and where it does exist, it is extremely limited. The GoSS Ministry of Energy and Mining has identified the electrification of market towns as a priority. Electrification is intended to encourage private sector investment.

Through the Southern Sudan Rural Electrification Program (SSREP) implemented by NRECA; and Market Towns Electrification Program, implemented by Louis Berger Group International (LBG) and its sub-contractor the National Rural Electric Cooperative Association (NRECA) International, USAID is supporting the provision of sustainable electric power to three market towns: Yei, in Central Equatoria; Kapoeta in Eastern Equatoria; and Maridi in Western Equatoria. Yei served as a pilot for the utilization of a cooperative structure for ownership and management of the electricity provider. It should be noted that implementation of SSREP was completed by NRECA in 2008 and handed over to GOSS. However, the Market Towns Electrification Program by LBG /NRECA picked up as a successor to SSREP and is still under implementation.

2. Background - Project Description

The SSREP Cooperative Agreement was completed in late March 2008. Originally, NRECA was preparing to handoff the project assets in May 2008 but this was delayed and is currently scheduled for early 2011. The delay was because there was no legal entity to take over the assets. Despite the inability to hand over the assets in 2008, a successful formal ceremony attended by the President of Southern Sudan was held in March 2008 that marked completion of the project.

Registration of YECO as an electric cooperative was subsequently achieved in March 2010, clearing the way for the handing over of the assets. After registration of YECO, an election was held that ushered in a new Management Board that currently runs the entity.

The key SSREP objectives with respect to Yei electrification were;

3. The introduction and provision of street lighting as a measure of public security in Yei town
4. The provision of reliable and affordable electricity that would facilitate operations and expansion of businesses in Yei town

These objectives were derived from the broadly prevailing electricity situation in Southern Sudan. Electric service in Southern Sudan exists in few communities, and where it does exist, it is extremely limited. The SSREP was designed to support infrastructure and institutional strengthening in Yei and Juba, and in a more general sense to facilitate a program of technically, financially, and institutionally sustainable investments.

During the first few months of implementation, and when the public lighting was being implemented in Yei, it became apparent that material, equipment and shipping costs in the region were increasing at alarming rates. Moreover, shortages in global markets resulted in higher costs for conductors, transformers, generators, and line hardware among others. The result of these upward pressures on project costs resulted in realignments of activities that affected the scope of work in other areas such as Juba.

The start of FY2008 marked the end of the Cooperative Agreement between NRECA and USAID ended and a new contract was signed between USAID and Louis Berger Group (LBG), but this time, NRECA came in as a nominated specialized subcontractor under LBG. The key activities under the new contract included the following;

- Establishment of systems and capacity for sustainable management of the Yei electric utility
- Capacity building of GOSS ministry of Energy and Mining and also that of Southern Sudan Electricity Corporation to be better placed to develop and manage sustainable electric power supply to market towns of Southern Sudan,
- Establishment of electric utilities in selected towns of Southern Sudan including related management structures and systems.

To develop electric utilities, the market towns of Maridi and Kapoeta were selected after an assessment was carried out covering other market towns in Southern Sudan.

After completion of the project in 2008, NRECA, through USAID funding, continued to provide technical assistance by providing two key personnel to manage the technical and commercial aspects of the Yei Electric Plant. This arrangement continued until April 2010 when one of the personnel was dropped, retaining one position for technical oversight on operations of the Yei Electric Plant. Currently, the customer base ranges from 800 to 1000 monthly with a bill collection rate of over 95 percent despite the high tariffs.

Currently, construction of electric utilities in both Maridi and Kapoeta is nearing completion with commissioning expected early in 2011. Both systems will have a capacity to generate 0.8 megawatts each when fully operational. The question that has been raised a number of times is whether the Yei YECO model should be used to manage and operate these new facilities, or if alternatively, there are other models that are more sustainable under the Southern Sudan environment. During the months of September and October 2010, NRECA organized stakeholder meetings where recommendations were made to adopt the YECO model for both Maridi and Kapoeta utilities. The only variation is that for Maridi, the proposal is to have the State Ministry of Physical Infrastructure own the assets to facilitate maintenance and possible expansion of the system.

In April 2006, the Yei Electric Company (YECO) began providing electricity and the project reports that it currently serves approximately 1000 customers; is currently 'operationally sustainable', meaning that collections are sufficient to cover operational costs and basic maintenance, but are not sufficient to fund expansion of service provision or catastrophic failure of generators (which otherwise are expected to last 20+ years); and that collection agreements have been reached with all service recipients, including schools, hospitals and government offices.

This level of sustainability and operations seems to represent significant improvement from 2008, when YECO only served approximately 360 customers and had trouble collecting from some customers such as the local hospital. However, long-term sustainability issues remain. A 2008 evaluation found:

"The evaluation team's overall conclusion is that the Yei electrification pilot project is not financially/economically sustainable under the current level of tariffs and current (lack of) operating subsidies provided by the Government. As such, it should not be replicated "as is" in other parts of Sudan." (see annex 1 - Executive Summary page iv).

The evaluation recommended that USAID consider whether alternative options to the creation of "YECO-like" utilities might be more efficient and sustainable in the long run.

In addition to the above findings, a recent audit conducted in 2010 (see annex 2) noted that YECO financial management systems and capacity needed strengthening. In response, the project has taken steps to improve its provision of training and capacity development in these areas. The effectiveness of the response is not yet known.

The projects in Maridi and Kapoeta are now nearing completion, and the project implementer reports that the local government officials and community members prefer to replicate the cooperative structure utilized in Yei.

3. Assessment Purpose and focus areas:

Given the finding of the previous evaluations and audits, USAID would like to verify the current state of operations and suitability of the YECO utility model including:

- The process undertaken to select a cooperative structure in Maridi and Kapoeta
- The suitability of this model for achieving the goal of sustainable provision of electricity

- Alternative models that could be used with a high degree of certainty within the Sudanese's context
- Additional assistance that may be needed over the medium to long-term to ensure the management capacity and access to credit and/or government funds needed to sustain and expand operations is available.

Specifically, the team was shall:

1. Assess the current and projected levels of financial sustainability of YECO, including issues of non-payment and unregistered connections.
2. For any indentified financial sustainability gaps, provide options and recommendations to address these gaps, including collection procedures, rates, technologies, and an assessment of the feasibility of accessing needed additional capital from financial institutions. When appropriate, highlight appropriate roles for the provision of financial and/or regulatory support from local and/or national government entities.
3. Assess YECO's current technical, financial and commercial management capacity and its ability to meet ongoing capacity development needs.
4. Assess the level of management capacity likely to be in place in both YECO and electricity providers in Maridi and Kapoata by the end of the project
5. If significant management capacity gaps are likely to remain upon the completion of the project, provide recommendations for cost-effective and sustainable means to meet medium and long-term capacity development requirements.
6. Assess YEI government and community leader satisfaction with the cooperative management structure being utilized.
7. Assess the effectiveness of the methodology utilized by LBG/NRECA in assisting local government and community leaders in Maridi and Kapoeta to assess a variety of management options, and to select an appropriate management structure.
8. Assess the anticipated level of sustainability of cooperatives in Maridi and Kapoata under a YECO-style cooperative structure, including an assessment of assumptions utilized, including willingness to pay, and key risk factors.
9. If the current cooperative management model is inappropriate or incomplete, the evaluation team should provide recommendations and detailed examples of alternate management structures that could be utilized to overcome sustainability constraints and that are likely to succeed within the southern Sudan context.

4. Assessment Methods and Procedures

The External Consultants will be provided the background materials (listed in section XX), before arriving in Sudan. They will be expected to be familiar with this information prior to arriving in Juba.

A Team Planning Meeting (TPM) will be held upon arrival in Juba to agree on how team members will work together, how they will interact with the client and other stakeholders, and to develop a work plan and finalize a Travel Schedule. The team will conduct meetings in Juba with USAID/Sudan, key GOSS institutions and implementing agencies. The team will need to visit project site(s) so some transportation will be arranged prior to the team's arrival. At a minimum the team will need to travel to Kapoeta, Yei and Maridi

During the TPM the team will finalize the methodology to be used and produce the evaluative instruments to be employed. The team will use the "Getting to Answers" approach detailed in Annex II of *the MSI Evaluation and Special Study Guide* to develop detailed qualitative and quantitative methodological approaches to meeting the terms of this Scope of Work.

We expect that in addition to basing the evaluation's findings on interviews and review of project documents, the team will also utilize the following simple approaches:

- Development of an interview guide to ensure that the correct evaluation questions are being addressed the appropriate individuals and that they are being posed and recorded consistently.
- Satisfaction survey
- Indicate other basic methodological approaches appropriate to the task, such as focus group discussions, key informant interviews etc.

Once the methodology has been finalized at the TPM it will be shared with USAID as part of the work plan approval process.

Information Available to Support the Assessment:

1. 2008 Evaluation Report
2. SSREP Final Completion Report
3. 2010 draft Audit Report
4. USAID Evaluation Guidelines
5. Stakeholder Meeting Reports for Maridi and Kapoeta
6. FY 11 Quarter 1 Progress Report and other project documents as relevant
7. List of potential key informants in Yei, Maridi, and Kapoeta
8. MSI Evaluation and Special Study Guide

5. Team Composition and Participation

Team Composition

USAID/Sudan is conducting this assessment in a collaborative manner to maximize USAID, GOSS and Implementing Partners learning opportunities. Accordingly, the team will be comprised as follows:

- Two External Consultants (skill sets detailed below), provided by MSI
- One representative of USAID
- One representative from GOSS
- One representative of Implementing Partner

Additional inputs may come from other staff from these agencies, as needed, and as coordinated by the respective team member.

MSI will need to facilitate the participation of GOSS and State Officials. The implementing partner will make recommendations and preliminary contact with these team members.

Given the significant contributions to the team expected from each team member, all except the state level participants are expected to be available to participate throughout the evaluation period.

Team Member Roles and Responsibilities

USAID, GOSS, and IP team members provide historical, contextual and programmatic background information that will inform the assessment. They will be expected to participate in the Team Planning Meeting (TPM), field visits, interviews, brainstorming on Findings, Conclusions, and Recommendations, and in the frequent reflections on evaluation learning, often occurring after a long day of interviews and traveling. These individuals participate as representatives of their respective organizations and are expected to share their learning with their home organizations so that all three key organizations are kept abreast of progress. It may well happen that the consultants will ask USAID, GOSS, or IP representatives to be excluded from certain portions of interviews in order to ensure candid responses.

The External Consultants will take the lead in conducting the assessment leading interviews, framing the analysis, facilitating group discussion and consensus, preparing for the debriefing, and drafting the evaluation report. One of the External Consultants will serve as the overall Team Leader. The Team Leader will take full responsibility for managing the team, organizing its work, and ensuring quality control and delivery of a final report acceptable to USAID. Precise division of labor among the two consultants will be determined at the TPM.

Evaluators Criteria

Team Leader – At least 15 years experience that cover electric utilities operation & management, financing, and partnership formation; 10 of which should have been in a developing country context. In addition, the lead evaluator should have a Master Degree or higher in Business, Economics, Electrical (Power) Engineering or similar field with relevance to the energy sector. The candidate should also have analytical evaluation and good report writing skills

Team member – The individual should have at a minimum a Bachelor's degree in electrical /power engineering with at least 8 experience in electric utilities operations and management in developing countries. Those with alternative degrees but have at least 10 years experience in commercial management of electric utilities are also encouraged to apply.

The Team Leader will be the formal representative of the team and will arrange for updates regarding progress against the evaluation work plan to the COTR (or his/her delegate) and MSI's Chief of Party (COP) or Assessment, Monitoring and Evaluation Specialist (AME), as determined at the TPM.

6. Activities, Logistics, and Timing

Prior to arriving in Juba, the External Consultants will have familiarized themselves with the background material provided to them, as referenced in Section 4, above.

All team members should be present for the TPM and for initial briefings and discussions with USAID's Economic Growth Office and other Mission officers, as well as IP and GOSS officials. A Work Plan and travel program for the in-country visit as well as the subsequent report writing period will be submitted to USAID for approval during the first few days of work in Juba. The Work Plan will also include a schedule for periodic MSI and USAID progress reports and possible submissions of specific work products, as determined by the parties.

Approximately four days prior to departure the Team will present to USAID, Implementing Partners, other development partners and the GoSS an out-briefing, with succinct supporting documents. The Draft Report will be submitted prior to the External Consultants' departure from Juba. There may be more than one outbriefing. The implementing partner will provide a list of GoSS and development partner representatives with whom they have been working to be invited. In addition members of the capacity enhancement working group should be issued an invitation.

The Mission and the IP will each submit its comments on the draft report within ten work days of receipt of the draft report. The Draft Final Report will be submitted to USAID ten work days after the Team Leader's receipt of USAID's and the IP's final written comments on the draft.

It is envisioned that all External Consultants will be in Sudan the entire duration of the evaluation's in-country component (six-day work weeks are authorized), including the TPM, a debriefing, and submission of a draft report to MSI's COP or AME prior to departure from Sudan. In addition to travel days, additional days are provided for the External Consultants to complete reading and processing all background information prior to departure for Sudan. Additional days are provided to finalize the report. (See section 7 below.)

MSI's field office in Juba will be responsible for travel arrangements (travel, housing in the field, etc.) for the USAID and GOSS team members. MSI will fund travel-related costs for GOSS team member(s), but not for IP or USAID team member(s).¹⁴ MSI and the Implementing Partners will jointly arrange all meetings for the team, in coordination with GOSS. The team will be provided office and meeting space, as needed, at SUPPORT's Juba Office Compound.

¹⁴ If the USAID representative is an Institutionally-Contracted Staff member provided by MSI, his/her travel costs will be provided by MSI separately.

7. Projected Level of Effort (LOE)

Tasks (Both External Evaluators, unless otherwise noted)	Work Days (6-day weeks in Sudan; 5 outside Sudan)
Initial Preparation Review documents, draft interview guide and proposed methodology, finalize travel schedule and travel days to Juba	5
Team Planning meeting Methodology, workplan development	1
In-Country Evaluation Initial briefings, meetings, field visits (Yei, and either Maridi or Kapoeta)	15
Draft Report and debriefings	5
Return travel	2
Final Report Preparation in home country Incorporate collective Sudan feedback, complete final report, and submit to MSI.	3
Total for Team Leader ¹⁵	31

8. Report Production and Format

The team will present for approval by USAID a draft outline of the report during its first week in country. The report must:

- Distinguish clearly between findings, conclusions (based strictly on findings) and recommendations (based clearly on the reports findings and conclusions);
- Comply with all instructions of the SUPPORT Project’s “Evaluation/Special Study Quality Management Guide” and meet the specific requirements of the “Evaluation Report Review – Score Sheet”, contained therein;
- Include a Table of Contents; a list or acronyms, an Executive Summary of no more than three pages; a section describing the project to be evaluated and purpose of the evaluation; a section on the methodology employed, including relevant skill sets of the evaluators;
- Include any annexes the team considers useful to the reader; and
- A copy of this SOW as an Annex.

A formal debriefing will be provided to USAID, the IP and the GOSS, as scheduled during the TPM and recorded in the evaluation work plan. The team will present key Findings, Conclusions and Recommendations for comment from the stakeholders. The team will record all relevant feedback from

¹⁵ The Team leader will have an additional 3 days of LOE for final edits to the report.

the meeting and will respond to all comments in completing its draft reports. The External Evaluators need not include all suggestions in the report, but must consider such suggestions in finalizing the Draft Report.

An electronic (in MS Word) version of the Draft Report will be presented to the IP and USAID in Juba with four hard copies being provided to the USAID/Sudan Mission and one hard copy to the IP prior to the departure of the Team Leader. The document will not exceed 40 pages, excluding annexes and Executive Summary.

The Mission and the IP will each submit its respective comments on the draft report *electronically* to MSI's COP – using the “track changes” and “comments” functions in MS WORD as much as possible. Each organization will combine internal comments, resulting in a unified set of comments from USAID and a unified set of comments from the IP. The Mission will receive ten paper copies of the final report as well as an electronic version, once the Mission has accepted the product.

9. Deliverables

- A draft work plan, ensuring that all aspects of Getting to Answers (from the TPM) are addressed
- A schedule of travel and key activities
- Interim progress briefings to MSI and the Mission, as determined during the TPM
- Preliminary report outline
- Draft Findings, Conclusions and Recommendations to MSI prior to completion of the first Draft Report
- Out-briefing, with supporting documents
- Draft report
- Final report

10. Compliance to USAID Regulations

The Team will ensure that the activity is fully compliant with the terms for Assessments contained in the USAID Automated Directives System (ADS) Series 203 and other relevant regulatory requirements, as may be determined by USAID. Additionally, the Team will utilize MSI's SUPPORT Project's “Evaluation/Special Study Quality Management Guide.” The Guide will be presented to the Team members prior to their initial TPM.

ENDNOTES

- ⁱ S1: Cost of Unserved Energy—IRP 2010 Input Parameter , Department of Energy, Republic of South Africa.
- ⁱⁱ S1: Cost of Unserved Energy—IRP 2010 Input Parameter , Department of Energy, Republic of South Africa.
- ⁱⁱⁱ SISP Task Order 3, Market Town Electrification—Establishing Sustainable Service Providers in Southern Sudan—Concept Paper, dated July 20, 2010, as prepared by NRECA International.
- ^{iv} Market Town Electrification, Task Order 3, Proposed Statement of Work FY 2009, August 19, 2008, as prepared by Louis Berger Group, Inc.
- ^v From NRECA Paper entitled Annual Budget and Tariff Setting, which states, “electric utilities normally charge a depreciation expense for its investment in fixed assets (electric system facilities). YECO, the initial cost of the electric generation/distribution system was provided via a grant in aid to YECO. Thus, rather than including a depreciation allowance in the tariff, YECO includes an allowance to establish a reserve for major replacements of fixed assets and to include more minor projected asset acquisition as a component of current tariffs.”
- ^{vi} SSREP Evaluation Report Recommendation stated that, “[t]ariffs should be fully cost reflective, i.e., should include proper depreciation charges related to the investment of creating YECO. These should be included in the tariffs regardless of source of funding for this initial investment. Any capital and / or operating subsidies provided to offset these costs for the benefit of consumers should then be specifically reflected in the interest of transparency and to aid in planning, budgeting and developing utility services.”
- ^{vii} From NRECA Letter of May 27, 2008 addressed to Mr. Boutros Magaya, Cognizant Technical Officer, USAID Sudan Field Office—RE: Cooperative Agreement: 623-A-00-05-00310-00.
- ^{viii} Ibid—p 20.
- ^{ix} Meeting Notes: Meeting in Juba with Chairman of SSEC on February 9, 2011.
- ^x Meeting Notes: Meeting in Kapoeta with Francis Mills IV on February 16, 2011.
- ^{xi} While the official exchange rate has devalued the SDG by 30 percent, on the unofficial market at the time of this writing, the currency have devalued 60 percent from the time the YECO equipment was purchased.
- ^{xii} Meeting Notes: Meeting with the YECO Board of Directors, Yei, February 4, 2011.
- ^{xiii} Meeting Notes: Meeting with Laban Kariuki, NRECA Project Manager, Juba, February 2, 2011.
- ^{xiv} Meeting Notes: Meeting with the YECO Board of Directors, Yei, February 4, 2011.
- ^{xv} Meeting Notes: Meeting with the Minister of Energy, statement by Samuel Taban, Director of Power Generation, Juba, February 14, 2011.
- ^{xvi} Meeting Notes: Meeting with the YECO Board of Directors, Yei, February 4, 2011.
- ^{xvii} Meeting Notes: From a meeting with NRECA Project Manager Laban Kariuki, February 10, 2011 in Juba.
- ^{xviii} Ibid.
- ^{xix} Letter from YECO Board President to the Minister of Energy, dated December 8, 2010.

^{xx} The explanation that was given for the negative fuel inventories was that the supplier did not invoice until well after the delivery; however, looking at the individual levels of inventory carried on the books of the company on a month-to-month basis, the average of these monthly inventories is negative, so the team suspects that there is something intrinsically wrong.

^{xxi} Notes from a meeting with Swalleh Rajab, Consultant to YECO, Juba, February 12, 2011.

^{xxii} Notes from a meeting with Laban Kariuki, NRECA Project Manager, February 12, 2011.

^{xxiii} Meeting Minutes: Meeting with Michael Malis Ismail, General Manager of YECO, Yei, February 4, 2011.

^{xxiv} YECO Job Announcement for an Administration and Finance Manager, January 25, 2011.

^{xxv} Provisional Training Courses and Target Groups—2011, NRECA provided document—undated.

^{xxvi} Meeting Notes: Meeting with YECO staff, Yei, February 4, 2011.

^{xxvii} Meeting Notes: Meeting with Commissioner of Yei River Country, Yei, February 4, 2011.

^{xxviii} NRECA's report entitled "SISP Market Town Survey Report" July 2008, p. 5.

^{xxix} Payroll costs—initial tariffs Maridi and Kapoeta, from NRECA, undated.

^{xxx} Notes from a meeting with Laban Kariuki, Juba, February 12, 2011.

^{xxxi} Separate documents, Preliminary Maridi Budget—2011; and Preliminary Kapoeta Budget 2011.

^{xxxii} Bob Dalton comments: "Of the two new Market towns, Maridi is already exceeding the expectations of the original survey. Serving a population of 58,000 (Central census) Maridi is an important learning and cultural center. It is also, due to Water and Power, drawing industry."

^{xxxiii} Notes from meetings with Tesfamichael Nahusenat Mititku, World Bank—Sudan, Juba, February 9, 2011; and with Richard Laliberte, Chief of Party, Sudan Core Institutions Project, Deloitte Consulting LLP, Juba, February 10, 2011.

^{xxxiv} http://www.usaid.gov/our_work/economic_growth_and_trade/development_credit/.