PROJECT INFORMATION DOCUMENT (PID)
APPRAISAL STAGE

Report No.: PIDA14884

Project Name	South Sudan Energy Sector Technical Assistance Project (P145581)
Region	AFRICA
Country	South Sudan
Sector(s)	General energy sector (100%)
Theme(s)	Infrastructure services for private sector development (75%), Rural services and infrastructure (25%)
Lending Instrument	Investment Project Financing
Project ID	P145581
Borrower(s)	Republic of South Sudan
Implementing Agency	Ministry of Electricity, Dams, Irrigation and Water Resources
Environmental Category	B-Partial Assessment
Date PID Prepared/Updated	10-Nov-2014
Date PID Approved/Disclosed	19-Nov-2014
Estimated Date of Appraisal Completion	22-Dec-2014
Estimated Date of Board Approval	17-Feb-2015
Decision	The team was authorized to (i) upgrade Pre-Appraisal of the Project to Appraisal and (ii) proceed with preparations for Negotiations.

I. Project Context

Country Context

The Republic of South Sudan is the world's youngest nation. After decades of civil war and strife, a Comprehensive Peace Agreement (CPA) was signed between the Government of Sudan and Sudan's People's Liberation Movement (SPLM) in 2005. As part of the peace agreement, a referendum on self-determination was held in January 2011 in which a vast majority of the people of South Sudan chose secession and independence. The Republic of South Sudan (RSS) became a reality on 9 July, 2011. The total population of South Sudan was estimated at 8.3 million people in 2008 with most people (83 percent) living in rural areas and dependent on subsistence agriculture. The new Government of the Republic of South Sudan (GRSS) constitutes a decentralized system comprising of the Central Government and ten state administrations. The administrative units of the lower level government comprise of county, payam, and boma.

South Sudan is highly dependent on oil resources. About 75 percent of former Sudan's oil resources are within the territory of South Sudan close to the border with Sudan. A pipeline through Sudan

enables export of oil from landlocked South Sudan. In 2012, the GRSS decided to shut down oil production over a transit fee dispute with Sudan. This oil shutdown in 2012 reduced Gross Domestic Product (GDP) by an estimated 54 percent within one year and forced the GRSS to impose harsh austerity measures across government and the civil service. A resolution to the dispute was reached in early 2013 and oil production is slowly resuming; however, the fiscal situation for most government ministries, departments, and agencies remains depressed. Before the oil shutdown, oil revenue made up almost 98 percent of Government's budget.

A Government in pursuit of evidence-based policies and programs. Since gaining independence in July 2011, the GRSS has formulated a program of public policies and investments aimed at building the foundations of a viable, prosperous and democratic state with the main objectives of spurring economic growth, reducing poverty, and improving public service delivery. The Government is pursuing these projects and programs using a results-based agenda outlined in the South Sudan Development Plan (SSDP) and other national and sector development frameworks. While some programs were halted due to austerity measures, the goal to develop core infrastructure sectors and promote private sector participation remains.

Challenges abound for South Sudan including ensuring peace and security. Violent conflict broke out in Juba in December 2013 and soon spread to other parts of the country. A ceasefire has now been agreed and the factions are working towards a sustainable political solution. The conflict has not reduced GRSS's need and desire for reliable energy infrastructure. In fact, the need for scaled-up support to develop energy sector institutions and to guide investment promotion efforts has become all the more pressing.

Sectoral and institutional Context

New Beginnings for the South Sudan Energy Sector

The electricity access rate in South Sudan is estimated to be about 2 percent, which is amongst the lowest national access rates observed globally. The per capita electricity consumption of South Sudan is about 10 kWh, also amongst the lowest compared to its neighboring countries. As is the case in much of rural Africa, majority of the energy consumed at the household level in South Sudan is used for cooking and lighting. An estimated 96 percent of the population uses firewood or charcoal as the primary fuel.

The demand for electricity vastly outpaces the supply. In FY2014, total energy sales in South Sudan were estimated to be 70 GWh with the peak load of 22 MW. Based on the economic growth rates in the post-independence period, the demand for electricity is expected to increase at around 7-8 percent per annum in the medium to long term. However, the electricity demand growth rate is expected to be much higher in the near term, given the fact that the sector is starting from a very low base (as high as 30 percent in FY2015 tapering to 15 percent by FY2018). There is also a substantial amount of suppressed demand that has not yet been quantified - the pace at which this demand can be satisfied will depend on the pace of investment in generation and transmission and distribution assets. Should the GRSS's target materialize, South Sudan could reach peak load demand of nearly 100 MW by FY2018 with energy sales of nearly 200 GWh by FY2018.

Presently, the available power generation capacity is estimated to be about 22 MW, primarily in major urban centers of Juba (12 MW), Wau (2 MW), and Malakal (5 MW). The investment in

additional supply has been hampered due to lack of finances and planning. Apart from the Government-run thermal plants and networks, a few donor funded projects also run distributed mini-grids in the town of Yei (1.2 MW), Kapoeta (0.8 MW), and Maridi (0.8 MW). The supply is exclusively based on thermal generators (using diesel) and mostly services public buildings, rich residential customers, and some commercial centers. The number of connections to the network is approximately 22,000 (including 1,500 consumers connected to the donor run mini-grids).

There are no high voltage transmission backbones or interconnected grid networks. The distribution network consists of about 15 km of 11 kV lines. There is an existing 220 kV interconnection with Sudan with connections to the Renk Town substation. However, this interconnection is not being utilized to its potential due to the politically sensitive nature of the relationship between the two countries and the fact that the demand in Renk Town is lower than the supply potential of the interconnection.

Those with access to electricity are concentrated in isolated distribution networks and encounter frequent power interruptions and poor overall quality of service. Most of the industries and businesses rely on self-generated captive power for electrical needs. Furthermore, there are no widespread Government programs for rural energy access or off-grid distributed energy generation. However, in the past, some programs have provided solar street lighting (in Juba), solar home systems, as well as solar lanterns to a few rural communities.

Energy Sector Challenges

Policy Framework and Institutional Reform: Clarity of institutional roles and responsibilities within the sector has not yet been achieved. The pre-independence interim Government established the Ministry of Energy and Mining (MoEM) in 2009. The MoEM had the responsibility of policy development and sector planning for the petroleum, energy, and minerals sector. However, in the post-independence era, the GRSS divided the MoEM into the Ministry of Electricity and Dams (MoED) and the Ministry of Petroleum and Mining (MoPM). In August 2013, MoED was combined with the Ministry of Water Resources to form the Ministry of Electricity, Dams, Irrigation, and Water Resources (MoEDIWR). The sector utility, the South Sudan Electricity Corporation (SSEC), functions as a budgetary department of the MoEDIWR. There are also separate proposals being developed to set up an independent Regulatory Agency and a Rural Electrification Agency (REA) for the sector.

In 2012, a draft Electricity Bill was presented for ratification to the Ministry of Justice (MoJ) and the Parliament; however, it is yet to be approved in light of the ongoing institutional changes. For instance, under the first version of the Electricity Bill, SSEC was proposed to be set-up as an autonomous institution. As the GRSS finalizes the details of the new institutional arrangements, the Electricity Bill, and associated regulations will help in the organization of the sector and provide for a sound legal and regulatory framework. In the medium term, the GRSS is also interested in exploring the viability of a management contract or concession for the SSEC as a possible option.

Sector Capacity and Performance: The capacity of the sector institutions to effectively plan, undertake, and manage investments is severely lacking. While a strong institutional structure constitutes a first step towards establishing a well-functioning sector, it is important to recognize that many of these institutions are new and will need time and significant capacity building to succeed in fulfilling their mandates. At present, the agencies are inadequately equipped to

undertake large scale infrastructure development projects. Despite employing large number of personnel, the sector institutions lack technical knowledge, as well as operational and managerial experience. The traditionally underfunded sector institutions depend on recurrent budget transfers to stay afloat which detracts attention away from their main business purpose of efficient technical and commercial operations and system maintenance for providing quality services to its consumers.

The sector suffers from poor overall operational efficiency. Inefficient tariff structures combined with high Aggregate Technical, Commercial, and Collection (ATC&C) losses, estimated to be around 30-40 percent, have also worsened the financial viability of the sector. The high technical losses are mainly due to outdated equipment that has not received upgrade or maintenance in many years. In addition, billing inefficiency and lack of effective collection mechanisms result in high commercial losses. Moreover, sector also suffers from governance and public accountability issues as many public institutions do not regularly pay their bills.

Affordability and Cost-Effectiveness: GRSS is struggling to enhance access to energy to the masses with appropriate speed and cost-effectiveness. At present, charges for a household to connect to the grid are approximately US$500-600 in fee, meter/wiring, and other charges. Furthermore, the electricity tariffs in South Sudan are amongst the highest in the region with average tariff being US $0.25/kWh. The high connection charge and monthly utility charges are prohibitive for many households. Together with improved capacity, efficiency, and performance of the sector, lowering the cost of generation, and introduction of cost-effective off-grid renewable energy (RE) and energy efficiency (EE) solutions are critical for the sustainability of the sector. In addition, the establishment of an appropriate pricing mechanism to ensure the sector's financial viability is important.

Financial Health of the Sector: The sector's challenges can be attributed to a mutually reinforcing negative spiral of lack of investment, and inefficiency which has resulted in compromised financial health of the sector. Tariffs structures have not remained cost reflective and revenue collection rates have been well below the levels needed to sustain sound operation and maintenance, further reinforcing the cycle of decline. In FY2014, SSEC's operational revenue (based on 70 GWh of electricity sold and about 99 GWh of electricity generated) were about US$17 million, and its operating expenses were US$71 million. The average cost of generation was US$0.70/kWh as compared to the average tariff from sales of US$0.25/kWh.

By FY2018, the fiscal impact of implicit subsidy to the energy sector is estimated to increase to US $133 million, equivalent to 8 percent of GRSS's budget. In FY2013, GRSS's subsidy to the electricity sector was around US$54 million, or, about 4 percent of GRSS's annual budget expense. The SSEC relies on heavy Government subsidy amounting to about US$0.54 for every kWh of energy generated in South Sudan (99 GWh generated in FY2013). As the SSEC currently functions as a budgetary department within the MoEDIWR, the financial losses are directly absorbed by the MoEDIWR (implicit subsidy).

Opportunity for Domestic Growth and Regional Participation

Reliable and Diversified Generation Mix: Despite ample natural resources, South Sudan's energy generation resources are not being efficiently utilized. Increasing installed capacity, while diversifying the generation mix to incorporate appropriate resources remains challenging. Currently, the reliance on imported diesel for generation causes the electricity supply to be

expensive and unreliable. Supply outages due to lack of fuel availability have been commonplace in the past. As the GRSS works towards development of domestic processing facilities for its petroleum resources, it is anticipated that hydrocarbon resources (e.g. heavy fuel oil, HFO) that would become available as a byproduct of the refining process would be a viable generation resource in the short to medium term.

As an important riparian country, South Sudan can also play a vital role in the development of the hydropower potential along the Nile River. The GRSS plans on heavily exploiting hydropower generation in the coming years. While some of the highest potential sites have been identified, at present, the development of large hydropower plants is at a concept stage and will take many years to study, plan, design, construct, and commission. Based on the GRSS's initial hypothesis, generation resources, in addition to fossil fuels and hydropower, could include, inter alia, solar power, wind power, geothermal, biomass, etc. Furthermore, viable sites for smaller hydropower plants could also become a part of the generation mix, especially, for remote rural areas, via distributed mini-grids. It is also important to note that generation investments need to be matched by efficient power evacuation systems (transmission and distribution networks) in order to achieve the most benefit of the resource for the country.

Regional Markets: There are opportunities for South Sudan to participate in regional power trade via the Eastern Africa Power Pool (EAPP). In the short term, the trade would likely focus on import; however, in the medium to long term, with the unlocking of South Sudan's natural resources, the trade could involve both imports and exports of power. Several opportunities for trade exist, for instance, Ethiopia and South Sudan could gain from closer cooperation and have already signed a Memorandum of Understanding (MoU) to this effect. Other options to be considered for interconnections could be Uganda and possible expansion of the interconnection with Sudan.

Off-Grid Access: Currently, there are no widespread GRSS programs for promoting rural electrification through the use of off-grid RE and EE technologies. While grid extension to all parts of the country remains a long term goal, incorporation of off-grid solutions, in parallel, is a very viable and cost-effective way of providing modern energy services to remote parts of South Sudan. These products and services are not only useful in off-grid areas but are also useful to those within the grid-connected areas unable to afford a connection or those who experience unreliable and poor quality of service.

Need for Scaling-up Investment in the Energy Sector

Value Chain Approach: Large scale investments are needed across the energy value chain. Presently, power generation is constrained by the inefficient exploitation of South Sudan's abundant energy generation (primarily petroleum and hydropower) resources. However, investments are needed across the entire energy value chain in order to be effective. Investment in generation assets, without supportive transmission and distribution systems and access enhancement programs would result in 'stranded assets' and inefficiency. GRSS has outlined goals for energy sector investments in the 'Economic Development Pillar' of the SSDP. The objective of the SSDP is to achieve diversified private sector led economic growth for employment generation and improved livelihood.

Systematic Engagement of Private Sector: Given the limited availability of public finances, and the

large scope of investments, leveraging private sector participation is and will continue to be vital to achieving GRSS's objectives. It is important for the GRSS to not only systematically engage the private sector for scaling up investments but also to provide a favorable investment climate, including, support for development of a sound legal and regulatory ecosystem, predictable commercial contracting frameworks, and an improved 'ease of doing business' environment that supports growth. Private sector participation can include not only generation investments but also downstream investments in transmission, distribution, and access.

Investment Planning and Preparation: There is an urgent need to take a holistic approach in identifying, preparing, and improving the bankability of investments. At the moment, no formal planning documents, or investment grade opportunities (e.g. technical studies) are available. In order to design the electric power system of the future in South Sudan, it is imperative that detailed planning exercises be carried out. The planning and preparatory work is not only necessary for identification of least-cost approaches and improved sequencing and timing of investments, but also for enhancing the overall bankability and attractiveness of the projects to secure financial resources from public or private sector partners.

II. Proposed Development Objectives

The project development objective (PDO) is to strengthen the capacity of the Recipient for improved energy sector planning and management supporting access enhancement.

III. Project Description

Component Name

Improved Sector Planning

Comments (optional)

Activities under this Component will focus on two main areas: (i) development of a detailed least cost investment plan (LCIP) (Master Plan) which will develop a framework for the GRSS in identifying and sequencing investments to attract financing for infrastructure development as well as effectively coordinate with donor and private sector partners, and (ii) detailed technical studies for preparation of investment ready transactions (including identification of engineering design issues, pre-feasibility, and options analysis of economic, financial, environmental and social impacts), for up to 4 high-priority projects that are needed to augment generation and transmission capacity of South Sudan.

Component Name

Capacity Building Support

Comments (optional)

This Component will support the development of a comprehensive capacity building program, based on the recently carried out Capacity Building Needs Analysis Report.

Component Name

Efficient Management

Comments (optional)

This Component will finance a distribution efficiency improvement program, primarily focusing on improved commercial operations.

Component Name

Off-Grid Access

Comments (optional)
This Component will support expansion of access to modern energy services to population segments that are not currently connected to the grid.

Component Name
Project Implementation Support
Comments (optional)
This Component will provide implementation support through appropriate expertise and operating expenditure support to the ESTAP Project Management Unit.

IV. Financing *(in USD Million)*

Total Project Cost:	15.00	Total Bank Financing:	15.00
Financing Gap:	0.00		

For Loans/Credits/Others	**Amount**
BORROWER/RECIPIENT	0.00
International Development Association (IDA)	15.00
Total	15.00

V. Implementation

A. Institutional and Implementation Arrangements

All Components of ESTAP will be implemented, coordinated, and managed by MoEDIWR. Following the ministerial reorganization in August 2013, MoEDIWR has been the lead agency in the sector and will be in charge of overall management, reporting, and coordination with partners and stakeholders during the implementation.

To facilitate the daily tasks, a PMU has been established in the MoEDIWR. The PMU will include members of the staff from the MoEDIWR and the SSEC based on their technical and managerial responsibilities and will be supported by external consultants. The PMU will report to the Under Secretary of the MoEDIWR. The structure of the PMU is as follows:

(i) Project Coordinator (Team Leader);
(ii) Finance and Accounting Officer;
(iii) Procurement Officer;
(iv) Environmental and Social Safeguards Officer; and
(v) Other Information Technology, Engineering, and Technical Staff (as needed).

Initially, it will also be necessary to recruit external specialists (Financial Management Specialist and Procurement Specialists) to fill gaps in skills and experience and to train and build capacity of the PMU staff. As the first IDA energy sector operation in South Sudan, capacity strengthening resources will be provided to the PMU to ensure effective implementation of ESTAP. A detailed Project Operations Manual (POM) will be developed by the PMU to clarify policies and operating procedures. In addition, the Bank will provide rigorous preparation and initial implementation support to assist the PMU in the execution of the Project related activities.

B. Results Monitoring and Evaluation

The PMU will be responsible for results monitoring and reporting. A core set of PDO level indicators and intermediate indicators with baselines, milestones and targets have been agreed. The results framework and detailed explanation of indicators are specified in Annex 1. Progress towards meeting the agreed targets for each indicator will be reported in the quarterly and annual reports of ESTAP. The PMU will draw information to monitor and evaluate performance from a host of different sources, such as, self-assessments, user-surveys, and data counting of agreed targets. Tasks related to reporting, such as, producing quarterly and annual reports will be planned, initiated and, closely monitored.

C. Sustainability

As described previously, the energy sector is in its initial stages in South Sudan; however, GRSS has demonstrated strong commitment to the overall development of the energy sector. Yet, there are several key challenges related to the long term sustainability and growth of the energy sector. Primary issues related to the sustainability of sector development are related to: (i) development of sound legal and regulatory environment, (ii) continuous support for sector capacity building, (iii) financial viability of the sector, and (iv) overall security situation in South Sudan. The Project will provide significant support to sector institutions and is designed around developing the skills needed to function effectively during project implementation and after the Project closes. There is significant emphasis on training, such that, GRSS staffs in the sector are well equipped for their positions to deliver the expected outcomes. While IDA financing under ESTAP will address several of these issues related to long term sustainability of the sector, for continued improvements, GRSS will need to undertake actions related to sector development.

VI. Safeguard Policies (including public consultation)

Safeguard Policies Triggered by the Project	Yes	No
Environmental Assessment OP/BP 4.01	×	
Natural Habitats OP/BP 4.04		×
Forests OP/BP 4.36		×
Pest Management OP 4.09		×
Physical Cultural Resources OP/BP 4.11		×
Indigenous Peoples OP/BP 4.10		×
Involuntary Resettlement OP/BP 4.12		×
Safety of Dams OP/BP 4.37		×
Projects on International Waterways OP/BP 7.50		×
Projects in Disputed Areas OP/BP 7.60		×

Comments (optional)

VII. Contact point

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