

**COMBINED PROJECT INFORMATION DOCUMENTS / INTEGRATED  
SAFEGUARDS DATA SHEET (PID/ISDS)  
CONCEPT STAGE**

**Report No.:** PIDISDSC15694

**Date Prepared/Updated:** 03-Feb-2016

**I. BASIC INFORMATION**

**A. Basic Project Data**

<b>Country:</b>	Sao Tome and Principe	<b>Project ID:</b>	P157096
		<b>Parent Project ID (if any):</b>	
<b>Project Name:</b>	STP Power Sector Recovery Project (P157096)		
<b>Region:</b>	AFRICA		
<b>Estimated Appraisal Date:</b>	30-Mar-2016	<b>Estimated Board Date:</b>	27-May-2016
<b>Practice Area (Lead):</b>	Energy & Extractives	<b>Lending Instrument:</b>	Investment Project Financing
<b>Sector(s):</b>	Hydropower (70%), Transmission and Distribution of Electricity (30%)		
<b>Theme(s):</b>	Rural services and infrastructure (20%), Water resource management (80%)		
<b>Borrower(s):</b>	Ministry of Finance and Public Administration		
<b>Implementing Agency:</b>	Agência Fiduciária de Administração de Projeto (AFAP)		
<b>Financing (in USD Million)</b>			
	<b>Financing Source</b>		<b>Amount</b>
	BORROWER/RECIPIENT		0.00
	IDA Grant		10.00
	Financing Gap		0.00
	Total Project Cost		10.00
<b>Environmental Category:</b>	B - Partial Assessment		
<b>Concept Review Decision:</b>	Track II - The review did authorize the preparation to continue		
<b>Is this a Repeater project?</b>	No		
<b>Other Decision (as needed):</b>			

## B. Introduction and Context

### Country Context

1. The Democratic Republic of São Tomé and Príncipe (STP) is an island state comprised of two main volcanic islands, and several islets located on the equator off the coast of central Africa. São Tomé, the largest island, covers an area of 859 km<sup>2</sup> with around 180,000 inhabitants. Príncipe Island, situated 150 km to the north, covers about 142 km<sup>2</sup> with around 7,500 inhabitants. The country is divided into six districts plus the Autonomous Region of Príncipe (RAP).

2. STP is a low-middle income country with a high poverty rate. Gross National Income per capita is estimated at US\$ 1,200 in Purchase Power Parity (PPP) terms; Gross Domestic Product (GDP) per capita is US\$ 1,692. One third of the population lives on less than US\$ 1.90 PPP per day (the new global extreme poverty line); more than two thirds of the population are poor using a poverty line of US\$ 3.0 PPP per day. STP's economy is based on services and the primary sector, with an almost non-existent industrial sector. The main economic activities are tourism, retail, transport, communication, and construction. Agriculture and fishing is the mainstay for the majority of the population despite a modest contribution to GDP.

3. Economic Challenges. STP faces challenges due to its isolated setting, its limited internal market, an undiversified economy, environmental degradation and climate change, frequent turnover in government, and management of revenues from incipient – though uncertain – oil sector. The main export is cocoa, while imports account for the bulk of consumption goods, including the oil needed to generate power in the country. This leads to a structural deficit of the trade and current account balances.

4. STP has a track record of continuous growth and a stable economy. Although the STP economy remains vulnerable to external and domestic shocks, its outlook is positive. The country's gross domestic product (GDP) is expected to grow by 4.4 percent in 2016. The annual average rate of inflation has trended downward consistently each year, from 26 percent in 2008 to 6 percent in 2015. STP has significant opportunities to diversify its economy through tourism, fisheries, hydropower as well as oil production. The country has also registered significant improvements in human development front. It ranks 144 out of 186 countries in United Nations Development Programme's (UNDP) Human Development Index (HDI), higher than the average in Sub-Saharan Africa.

5. Political context. STP was one of the first African countries to implement democratic reforms and has been largely free of conflict and political violence since holding its first multiparty elections in 1991. However, internal political wrangling has caused repeated changes in governments and two failed coups in 1995 and 2003. Political conditions are now more stable. 2014 parliamentary elections yielded an absolute majority for the Acção Democrática Independente party (ADI), led by the former Prime Minister, Patrice Trovoada, securing an absolute majority with 33 out of 55 seats in parliament. This outcome instills more confidence that for the first time a government will finish its four year term.

6. Social context. The country still faces significant risks due to social stability. The country's heavy dependence on imports of essential goods will leave it vulnerable to bouts of rapid consumer price inflation in the event of supply shocks. Ongoing power cuts, poor provision of basic social services and recurrent allegations of financial irregularities in the public sector also risk undermining support for the government.

### Sectoral and Institutional Context

1. Electrification rate and electricity consumption. Electricity coverage in STP extends to only about half the population. Electricity is more widespread among non-poor families (58.3 percent) compared to poorer families (47.5 percent). Lighting is instead powered by kerosene to a

larger extent in poor households (42.1 percent) than in non-poor households (31.8 percent). PV lighting has been installed by donors in some schools and is used for street lighting in some areas. Biomass (firewood and charcoal) is used heavily for cooking purposes. The use of energy sources varies widely, with 73.9 percent of households in rural areas using firewood or charcoal for cooking compared to 34.6 percent in urban areas.

2. Sector institutions. The Empresa de Água e Electricidade (EMAE) is an autonomous state owned enterprise providing water and energy services. The Ministry of Finances and Public Administrations (MoFPA) oversees EMAE's financial performance and is responsible for approving tariffs. The Ministério de Recursos Naturais, Energia, e Ambiente (MRNEA), the Ministry of Natural Resources, Energy and Environment, oversees EMAE's technical performance. The Empresa Nacional de Combustíveis e Óleos (ENCO) is the sole supplier of fuel in STP. ENCO is owned at 75% by Angola National Fuel Company SONANGOL. The Autoridade Geral de Regulação (AGER) is the multi-sectoral regulatory agency. Recently, a Planning Agency has been created under MRNEA (with staff seconded by EMAE), with the objective of creating a masterplan for the energy sector.

3. Transmission and distribution networks. The electricity grid in São Tomé is old and poorly maintained, leading to high technical losses. In addition, the island lacks a centralized control system for the electricity network, challenging the ability of the technicians to locate problems within a reasonable timeframe, and affecting the quality of the supply. EMAE has recently obtained donor funding to implement several grid improvements (increase of voltage level, build a new dispatching center and expand the distribution network to the north and south of the Island. A contract has been signed with the Portuguese company EFASEC financed by a Portuguese credit.

4. Electricity supply and future demand. EMAE interconnected generation assets on São Tomé Island include three diesel thermal power plants (Santo Amaro, São Tomé, Bobo Forro) and two hydro power plants (Contador and Agostinho Neto). São Tomé power plant has a low efficiency, leading to very high fuel consumption. Bobo Forro is operated by a private operator that sells electricity to EMAE at a high price. Santo Amaro, is a 8.5MW diesel power plant which was built in 2012 with financing from Taiwan. This plant has provided some relief to short term capacity constraints and has allowed to meet the increasing demand. According to EMAE operation data the maximum peak demand for São Tomé is around 14 MW, which is very near the available capacity (16 MW). Reliability has been an increasing problem since two power plants in the Island went out of service (Bobo Forro 1 and Guegue hydropower plant) in respectively 2013 and end 2014. A simple outage of generator or transmission/distribution line is able to interrupt the supply, sometimes in a domino effect leading to a complete blackout. In order to try to meet future power demand in São Tomé, EMAE has reached an agreement with Taiwan to finance a new solar PV plant. In addition, a new small diesel power plant is being discussed with a Portuguese company.

5. The installed capacity on the island of Príncipe is 1,696 kW, of which only 900 kW are available. . Most of the thermal generators have very low efficiencies (300g of diesel or more per kWh) leading to high fuel consumption. UNDP have plans to help develop a new mini-hydro power plant and extend the grid in collaboration with the South African Group HDB, owner of five-star hotel on the island.

6. STP is endowed with numerous small hydroelectric sites (up to 4-5 MW). Some hydropower sites operated by cacao plantations during colonial times have been abandoned. Different parts of governments have signed Memorandum of Understanding (MoUs) with private companies for the development and operation of several hydro sites but no project has been developed so far. Most of the contracts do not include deadlines for project development or

dispute mitigation mechanisms. The approval of the new “Marco Juridico do Sector Electrico” (Regulatory framework for the Electricity Sector) in December 2014 establishes the right of the GoSTP to evaluate all the active generation contracts/MoUs, and declare them void within a year if no action is taken by the developers. EMEA has compiled a list of MoUs and agreements but no action has been taken yet.

7. Peak demand current data and forecast estimations are based on energy consumption data that are not accurate due to metering deficiencies in EMAE. Large clients such as hotels rely on their own generators and are not connected to the electric grid. The Deep Water Port, a project that has been under preparation for several years, could increase the system’s demand significantly by adding 10 MW to peak demand. It is unclear whether the port will be generating its own power or if it will connect to EMAE’s grid.

8. The electricity tariff does not recover the costs of service. Operational expenses are approximately US\$0.46/kWh in 2009, while the average tariff was US\$0.35/kWh. This tariff resulted in an operating loss of approximately US\$0.11/kWh invoiced. The STP energy sector relies almost exclusively on imported liquid fuels. EMAE pays a price 35% below the market price to buy fuel from EMCO. Operating losses have increased over the last years due to the fuel consumption in Santo Amaro and increasing technical and non-technical losses. In late 2014, EMAE owed ENCO US\$ 38 million in arrears. As the EMAE’s accumulated debt increased and the Government took on the role of “lender of last resort” in order to keep the company operating.

9. High non-technical losses. Total losses are estimated to be around 30 percent. The system does not allow to estimate non-technical losses with accuracy. Non-technical losses consist primarily of electricity theft, non-payment by customers, and errors in accounting and record-keeping. The poor status of the distribution network allows easy access for illegal connections, and the lack of power measurement and the transformer level and non-existent integrated management system for EMEA, makes difficult to ensure relevant billing.

10. World Bank Group sector analytics. The World Bank Group (WBG) has supported technical assistance to the energy sector in the past years. In 2010, a Public-Private Infrastructure Advisory Facility (PPIAF)-funded study assessed the needs of the power sector and the possibilities of revitalization. In parallel, International Finance Corporation (IFC) conducted another activity aimed at improving the performance of the public utility EMAE. Both studies agreed on the urgent need to implement an immediate action plan to address the lack of capacity constraints, lack of resources to pay for fuel and grid maintenance that causes frequent interruptions of supply in large areas of the island. In 2014 the SIDS-DOCK program, managed by Energy Sector Management Assistance Programme (ESMAP), financed technical studies focusing on the technical and economic feasibility of the Rehabilitation of “El Contador” hydropower plant, as well as grid studies aimed at prioritizing investments in the electricity network to reduce the technical and non-technical losses incurred by EMAE.

11. Priorities going forward. Past WBG analytical work shows that improving energy services in Sao Tome and Principe will require investment along the value chain, reduction of cost through a change in energy mix and loss reduction, improvements in sector institutions, and increasing revenues to the sector. The rehabilitation of existing hydro plants and new hydro developments could play an important role in the recovery of the power sector. In that case, updating the existing evaluation of the Island’s hydropower potential as well as potential cumulative impacts assessment of hydropower development would be required to be carried out in parallel.

### **Relationship to CAS/CPS/CPF**

1. The proposed Project is aligned with the WBG São Tomé Country Partnership Strategy (CPS) FY2014-18. The CPS places emphasis on creating an environment that encourages private

sector investment in the tourism, fisheries, and agribusiness sectors. The proposed project contributes to the target of the CPS of mitigating the risk of inadequate institutional and implementation capacity by building capacity to establish a more reliable investment climate in the energy sector.

2. The project is also in line with the 2012 Poverty Reduction Strategy Paper (PRSPII) which highlights the enormous energy problems to enable private sector development. Many businesses are required to use diesel power generators, with the economic additional costs this entails, thereby increasing their operating expenses.

### **C. Proposed Development Objective(s)**

#### **Proposed Development Objective(s) (From PCN)**

The proposed project development objective is to increase hydropower generation and reduce distribution losses.

#### **Key Results (From PCN)**

Progress toward achieving the PDO would be measured by the following indicators:

- Quantity of electricity generated from rehabilitated hydropower plant (GWh/year)
- Electricity losses per year in the project area (percentage)
- Direct project beneficiaries (number), of which female (percentage)

### **D. Concept Description**

1. The proposed Project consists of three components: (1) Rehabilitation and expansion of El Contador hydropower plant and Operations and Maintenance (O&M) support program, (2) Electricity network investments, and (3) Project implementation support.

2. Component 1: Rehabilitation and expansion of El Contador hydropower plant and O&M support program. (US \$ 6.5-8 million). This component will finance the rehabilitation and expansion of el Contador Hydropower plant on Sao Tome island as well as an operation and maintenance (O&M) program for the plant. El Contador hydropower plant is owned and operated (as a peaking plant) by EMAE. Prior analytical work by the World Bank Group concludes that the rehabilitation of the plant is both necessary and economically feasible.

3. The component consists of two subcomponents:

- Subcomponent 1A: Rehabilitation and expansion of El Contador Power Plant. This component will finance the works to upgrade and expansion of the water load chambers, channels and mechanical and electrical equipment to expand the peak capacity of the plant from 2MW to 4-7 MW. Additional optimization analysis need to be completed to define the peak capacity of the hydropower plant and the best technical configuration.

- Subcomponent 1B: O&M support program. This subcomponent will support an O&M support program to ensure the sustainability of the rehabilitated hydropower plant. This subcomponent will finance the technical assistance needed to define the best implementation arrangements for the sustainable operation and maintenance of the hydropower plant. The subcomponent will also finance capacity building and coaching for EMAE staff and/or external contractors working with the staff.

4. Component 2: Electricity network investments (US \$ 1-2.5 million). This component will finance investment in the electricity network which may include the rehabilitation and/or strengthening of overloaded sections, installation of residential and industrial electricity meters and set-up of a commercial management system, as well as dispatching and selectivity improvements. The selection of specific equipment will be based in the recommendations of Bank-financed grid studies and the outcomes of the ongoing selectivity analysis financed by

African Development bank (results expected by the end of 2015). As part of project preparation, the project team AFREA Gender and Energy program, will define a design a gender sensitive information campaign related to commercial management, the installation of metering systems, and power theft.

5. Component 3: Project implementation support (US \$ 1.0 million): This component will finance project implementation support including training for AFAP and EMAE staff, fiduciary duties, engineering (design and supervision of works) and preparation of safeguards documents.

## II. SAFEGUARDS

### A. Project location and salient physical characteristics relevant to the safeguard analysis (if known)

The safeguard category recommended for the Project is “B” as the type of interventions foreseen would not have major impacts on the population or the environment. Potential negative impacts likely to be caused by the Projects are site-specific, limited and thus manageable.

### B. Borrower’s Institutional Capacity for Safeguard Policies

1. The fiduciary agency that would lead the PIU (AFAP) is under the Ministry of Finance and Public Administration (MFPA) and has long experience in implementation of WB financed projects on Education, Telecommunications, among others. One of the reference project recently implemented by AFAP is the Central African Backbone (CAB) Project, a category B project which triggered two safeguards policies (OP/BP 4.01 and OP/BO 4.12). AFAP is composed by 6 permanent staff members, including the director, procurement and financial manager.

2. The project implementation strategy includes hiring specialized technical adviser. The technical adviser will ensure the coordination with the project beneficiary and other relevant government institutions. For the case of the CAB project, the implementation of safeguards instruments was done through the Environmental Department of the Ministry of Public Works and Natural Resources (MoPWNR) which was part of Steering Committee established to follow-up and monitoring the project. The model used for CAB project may be applicable to implement safeguards in the proposed Power sector Recovery Project in São Tomé and Príncipe (STP). The inclusion of an environmental and social safeguards specialist in the PIU team may be necessary depending on the scope of the interventions.

### C. Environmental and Social Safeguards Specialists on the Team

Nuno Maria Brilha Vilela (GENDR)

Paivi Koskinen-Lewis (GSU01)

### D. POLICIES THAT MIGHT APPLY

Safeguard Policies	Triggered?	Explanation (Optional)
Environmental Assessment OP/BP 4.01	Yes	The environmental Assessment OP/BP 4.01 will be triggered. Because the exact magnitude and location of the works is not yet known, an ESMF will be prepared, consulted upon, and disclosed prior to appraisal. When the optimization and rehabilitation engineering studies will be available and the physical footprint and magnitude of the rehabilitation works precisely defined (mainly the volume/dimension of the water storage tank to be constructed for increase

		peaking capacity), an Environmental and Social Impact Assessment (ESIA) and Environmental Management Plan will be prepared to manage and mitigate the construction and operational environmental and social impacts of the rehabilitation works.
Natural Habitats OP/BP 4.04	TBD	To be confirmed during preparation based on additional information requested from the client.
Forests OP/BP 4.36	No	This policy is not triggered as the project will not involve any change in the management of the forest resource. Localized Impacts on forest (if any) will be covered under the Natural Habitats policy.
Pest Management OP 4.09	No	The project does not involve the use of pesticides or have any impact on pest management practices.
Physical Cultural Resources OP/BP 4.11	No	The project will not entail large excavations and is not located in an area of known significance from this policy's perspective.
Indigenous Peoples OP/BP 4.10	No	There are no indigenous people in the project area.
Involuntary Resettlement OP/ BP 4.12	No	<p>OP 4.12 is not triggered because even though some limited land acquisition may take place, it will not lead to physical or economic displacement. Component 1 will be designed in such a way that the project will not finance any works that lead to economic and physical displacement. This will be particularly true when choosing the site for potential additional water storage with the construction of water tanks. Given the likely scale of works and accessibility from the capital, construction of specific workers' camp sites is not anticipated either.</p> <p>The Client indicated that the lands covered by the footprint of the project were the property of EMAE.</p> <p>The inspection survey along the 8km canal indicated that critical structures of the scheme are accessible by roads already cut (paved up to the powerhouse and then earth roads to the different intakes). It is expected that the works will not create new accesses but will mainly comprise reinforcement and stabilization of existing roads to carry materials and equipment. No houses were encountered in the direct vicinity of the project footprint during the site visit and there is no evidence of squatters.</p> <p>Components 2 and 3 will not finance activities that</p>

		would lead to economic or physical displacement. Component 2 will finance installation of protection systems on the existing grid, rehabilitation of some portions of the grid (to be determined) and installation of meters for large customers, and these activities will not require land acquisition.
Safety of Dams OP/BP 4.37	No	Regarding Safety of Dams OP/BP 4.37, the topography is not favorable for water storage in the event of a dam heightening (very steep slopes). Moreover, the amount of boulders, colluvium, and sediments carried out by the river during rainy season will make the storage capacity created at the intake sites technically unsustainable. Consequently, the team is not in favor of any dam heightening at the intake location, and in any case not above the 15 m threshold consider by ICOLD as a large dam. The storage capacity would be created by a water tank in a suitable location along the canal. The structures are therefore expected to remain, after rehabilitation, small intakes of about 5-7 m high maximum.
Projects on International Waterways OP/BP 7.50	No	
Projects in Disputed Areas OP/BP 7.60	No	

## E. Safeguard Preparation Plan

### 1. Tentative target date for preparing the PAD Stage ISDS

28-Dec-2015

### 2. Time frame for launching and completing the safeguard-related studies that may be needed. The specific studies and their timing should be specified in the PAD-stage ISDS.

1. The safeguards studies include an Environmental and Social Management Framework (ESMF), since the exact location and magnitude of the project footprint is not yet known (in particular the volume, dimensions and exact location along the 8 km canal of the concrete water tank to be created for increased peaking capacity). It will be prepared, consulted upon and disclosed in-country and at InfoShop prior to appraisal.
2. An ESIA will be carried out when the preliminary results of the technical studies provide an exact indication of the rehabilitation and expansion magnitude and footprint. It will identify potential environmental and social impacts and devise mitigation and monitoring measures.
3. The different components will be designed in such a way that the project will not finance any works that lead to economic and physical displacement. Under that condition, Involuntary Resettlement OP/BP 4.12 is not triggered.

## III. Contact point

### World Bank

Contact: Christopher Saunders



Title: Energy Specialist  
 Contact: Nicolas Jean Marie Sans  
 Title: Hydropower Specialist

**Borrower/Client/Recipient**

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**Implementing Agencies**

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**IV. For more information contact:**

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**V. Approval**

Task Team Leader(s):	Name: Christopher Saunders, Nicolas Jean Marie Sans	
<i>Approved By</i>		
Safeguards Advisor:	Name: Johanna van Tilburg (SA)	Date: 04-Feb-2016
Practice Manager/ Manager:	Name: Meike van Ginneken (PMGR)	Date: 04-Feb-2016
Country Director:	Name: Elisabeth Huybens (CD)	Date: 08-Feb-2016

1 Reminder: The Bank's Disclosure Policy requires that safeguard-related documents be disclosed before appraisal (i) at the InfoShop and (ii) in country, at publicly accessible locations and in a form and language that are accessible to potentially affected persons.