Project Information Document (PID)

Concept Stage | Date Prepared/Updated: 14-Jul-2021 | Report No: PIDC31875

BASIC INFORMATION

A. Basic Project Data

Country	Project ID	Parent Project ID (if any)	Project Name
Sudan	P176711		Sudan Energy Transition and Access Project (P176711)
Region	**Estimated Appraisal Date**	**Estimated Board Date**	**Practice Area (Lead)**
AFRICA EAST	Aug 02, 2021	Sep 28, 2021	Energy & Extractives
Financing Instrument	**Borrower(s)**	**Implementing Agency**	
Investment Project Financing	The Republic of Sudan	Sudan Electricity Holding Company	

Proposed Development Objective(s)

The development objective is to increase availability of and access to electricity services in Sudan.

PROJECT FINANCING DATA (US$, Millions)

SUMMARY

Total Project Cost	303.00
Total Financing	303.00
of which IBRD/IDA	300.00
Financing Gap	0.00

DETAILS

World Bank Group Financing

International Development Association (IDA)	300.00
IDA Grant	300.00

Non-World Bank Group Financing

Trust Funds	3.00
Japan Policy and Human Resources Development Fund	3.00

Environmental and Social Risk Classification	Concept Review Decision
High	Track II-The review did authorize the preparation to continue

Other Decision (as needed)

B. Introduction and Context

Country Context

1. **Sudan's recent political transition presents a unique opportunity for a significant jump in its development trajectory.** A transitional government of Sudan (GoS) consisting of civilian and military representatives was installed in 2019, after the overthrow of the "old regime" that had been in place for the previous 30 years which was also a period of international isolation and arrears with financiers. The new government has implemented measures to resolve internal conflict and has re-engaged with the international community, including the International Monetary Fund[1] and the World Bank, while initiating broad-based and comprehensive economic reforms. The removal of Sudan from the US list of countries that sponsor terrorism in December 2020 and economic sanctions imposed by US in 1997 and return of Sudan to accrual status with international financiers (with the WB in March 2021 and African Development Bank in May 2021) led to optimism that Sudan can transition to an ambitious development path.

2. **Sudan continues to be hard-hit by triple shock of COVID 19, locust infestation, and massive flooding.** The secession of South Sudan in 2011 meant that Sudan lost most of its oil reserves and since then has struggled to diversify its economy beyond its dependence on petroleum. UN sanctions, economic mismanagement, a violent conflict, and social unrest over the years had already impacted economic performance adversely. The joint Bank-Fund Debt Sustainability Analysis (DSA) of end-2019 estimated Sudan's total public and publicly guaranteed debt to have been above 200 percent of GDP. Public and external debt ratios remain high, with most external debt in arrears. Successive external shocks to the economy from COVID-19, a locust infestation, and massive flooding in 2020 also negatively affected economic growth and fiscal revenues, while putting additional pressure on expenditures. Of countries in East Africa, Sudan is one of the hardest hit by COVID-19. The associated lock-down has had an unprecedented social and economic impact, resulting in increased prices of basic foods, rising unemployment, and falling exports. GDP is expected to decline by 3.6 percent in 2020, while CPI inflation rose to 254 percent per annum in November 2020.

3. **The government targets ambitious reforms and policy adjustments for economic stabilization, growth, and welfare of the population**. These include a reduction of fuel subsidies and exchange rate unification, both of which will be key to economic stabilization. The fiscal space afforded by fuel subsidy reduction is intended to be used for deficit reduction and formerly neglected areas of social spending. Other initiatives focus on boosting public sector transparency and accountability, improving the climate for private business and entrepreneurship, tax reform, financial sector regulation and inclusion, anti-corruption, and civil service reform. The government is also supporting a broad agenda for human rights and justice, which included in 2020 a ban on female genital mutilation. The 2020 budget represented a qualitative break from the past in reallocating resources from commodity subsidies to social spending and wages. Civil service wages were revised sharply upward after being devalued during the very high inflation of 2018-2019. Additional spending was also directed to emergency health programs to meet the challenges of COVID-19 and other natural disasters. As part of its response to the pandemic and to mitigate the adverse impacts of economic reforms, the Government has launched the Sudan Family Support Program.

[1] The GoS agreed on a Staff Monitored Program (SMP) with the International Monetary Fund (IMF) in 2020 to underpin its economic reforms.

4. **Following the 2019 revolution, GoS has reached a milestone agreement for peace as a step to end long-standing internal conflict.** In February 2021, a new cabinet was formed to include key representatives from parties from Darfur, South Kordofan and Blue Nile states, to join the transitional government. There is a high expectation for the transitional government to deliver tangible improvement in the lives of Sudanese people, including those in the post-conflict areas. The GoS has also adopted a Poverty Reduction Strategy Paper (PRSP) in May 2021, which outlines GoS's commitment on key areas of reform for poverty reduction, economic recovery and development.

Sectoral and Institutional Context

5. **Sudan's Ministry of Energy and Petroleum (MoEP) oversees the energy sector.** The electricity sector is administratively unbundled into five sector companies: Sudan Electricity Holding Company (SEHC), Sudan Thermal Power Generation Company (STPG), Sudan Hydro and Renewable Energy Company (SHREC), Sudan Electricity Transmission Company (SETC) and Sudan Electricity Distribution Company (SEDC). Although these sector companies function as electric utilities, they are integrated into MoEP and do not have financial autonomy as their operations largely depend on budgetary appropriation. The Electricity Regulatory Authority (ERA) is also part of the MoEP. Most of Sudan's electricity generation is publicly owned, except for some thermal generations in isolated grids and emergency powership rental, which are operated by Independent Power Producers (IPPs).

6. The overarching policy framework is the Electricity Act of 2009 which is currently being revised to create an independent sector regulator and establish a legal framework for supporting renewable energy development and energy efficiency, including tax exemptions for renewable energy investments and mandatory energy audits for public buildings. All of these will also facilitate Sudan's clean energy transition which is aligned with Sudan's Nationally Determined Contribution (NDC), which notes the country's ambition to scale solar and wind generation to 1,000MW by 2035 and strengthen energy efficiency interventions.

7. **The electricity tariff in Sudan is one of the lowest in the world.** With a recent fourfold revision in January 2021, the average tariff has increased to US$ 0.023/kWh at the market exchange rate, but remains exceptionally low in comparison with tariffs in other Sub-Saharan African countries. The revised tariff structure is characterized by a generous lifeline extending to consumption of 100kWh/month. Due to almost universal use of pre-paid meters, bill collection rate stands at 93% and electricity theft is minimal. Hence the shortage of sector revenue is attributable to the low level of tariffs. In 2020, the sector recovered less than 20 percent of operational costs.

8. **Household electricity consumption in Sudan is among the highest levels in the world.** The low price of electricity, combined with the hot climate and inefficiency of appliances, Sudan's level of electricity consumption is very high compared to its regional peers. In 2018, the average household consumption of electricity in Sudan was 308 kWh per month, more than five times higher than SSA average which is around 50kWh/month. The residential sector constitutes 60% of the electricity consumption in Sudan and therefore is the largest user segment. Low price provides almost no incentive for households to conserve energy and wasteful use of power is observed.

Sudan's energy sector faces multiple interlinked challenges

9. **Sudan is facing power crisis as a result of severe demand-supply imbalance.** The country has long suffered from major load-shedding in summer, when generation capacity has been insufficient to meet stepped up electricity demand. In 2019, available capacity was only 2,799MW, compared to a peak demand of 3,800MW, leaving a shortfall of 1,000MW which resulted in rationing of power, with customers receiving electricity for only 8 hours a day in the brutally hot summer months. Load shedding, combined with the severe shortage of fuels in the market, has hit economic activity hard and is adding to the overall dissatisfaction of the public with the electricity sector and the GoS.

10. **Recent economic crisis has restrained the sector's access to key supplies and deteriorated the quality of electricity service.** Most generation assets have been maintained in sound working condition despite their age and the

challenge of procuring spare parts while the country was under economic sanctions. The GoS has worked with countries with which it has economic relationships — Arab countries, as well as China and Turkey — to procure the necessary spare parts. In 2021, transmission and distribution losses in Sudan were at at 30 percent (25 percent distribution losses and 5 percent transmission losses). The bill collection rate is 93 percent, attesting to the quality of commercial management and the universal use of prepaid meters. However, recent economic crisis and assoiated shortage of foreign currencies became major obstacles for the sector to access key supplies. Towards the end of 2020, signifciant number of generation units had to stop operation due to the lack of critical spare parts.

11. **Electricity is not reaching most of the poor in Sudan and in particular fragility, conflict, and violence-affected areas.** Sudan's access to electricity stands at approximately 54% (Tier 1 and above), comprising of about 32% connected on-grid to SEDC, 14% connected to stand-alone diesel-based isolated grids and 8% to stand-alone solar PV systems (with batteries). This means about 20 million people are without access to electricity. In line with the geographical locations of distribution grids, the highest electrification rates (60 percent and above) are in Khartoum, Jazeera, River Nile, and Northern States. The largest electricity access deficit is observed in the Darfur and Kordofan regions, where the national grid has not reached despite the significant population residing there. Since Sudan's population is growing at a rate of 2.4 percent a year, achieving universal access will require that electrification grows at an even faster rate, beyond 1.7 percent per year which has been the annualized rate between 2010 and 2019.

12. **The sector financial situation is tenuous.** The Bank's sector financial projection suggests that in the absence of other changes, the revenue gap will continue to grow as the Sudanese currency depreciates, making imported fuel more costly. Tariff reform underpins the sector's pursuit of financial recovery and service delivery, as well ensuring the fiscal sustainability of the GoS. The financial sustainability of electricity sector has direct implication for the GoS's macroeconomic stabilization. In 2019, half of government spending (US$ 3 billion, or 10.9% of GDP) went to fuel/electricity subsidies. While reform on retail diesel and gasoline subsidies have progressed substantially, electricity continues to be heavily subsidized and the GoS has been printing money to fill the budgetary deficit, fueling annual inflation higher than 350%.

This project is first lending operation in the sector, building on the Bank's engagement that began in 2017

13. **This project builds on the Bank's strong client engagement in technical advisory and analytical work.** The Bank has been engaged in Sudan's energy sector since 2017 through the electricity sector diagnostics work (Diagnostic Review of Sudan Electricity Sector, P153717) which started as a greenfield engagement. Based on the findings of the diagnostics, the Bank has launched a comprehensive technical assistance program (Sudan Energy Sector Recovery Technical Assistance, P171810), which is supporting the design of the fuel subsidy reform and designing policy measures for electricity sector recovery, including electricity access, energy efficiency and renewable energy scale-up.

14. **In the short term SETAP will provide an immediate relief for the current power crisis.** The rehabilitation/upgrade of the distribution network and load dispatch center, the provision of efficient lighting units, the supply of critical spare parts for thermal generation, and the provision of solar PV systems will help address the power supply shortfall and mitigate the impacts of the tariff reform. Expected tariff reform will also optimize the electricity consumption and enable the sector to purchase necessary fuels for thermal generation and carry routine O&M. SETAP also complements HoA-RISE project by improving the power system operation to integrate power imports from Ethiopia and Sudan. In the medium term, SETAP will support the GoS and its efforts to develop a national RE program. This will help to unlock new energy sources, contribute to the diversification of its electricity generation mix and reduce generation costs, further contributing to the power sector's financial sustainability.

Relationship to CPF

15. The Country Engagement Note (CEN) for Sudan FY20-FY21 is currently under preparation. The latest draft is conceptualized around (a) Stabilization and Gaining Access to IFI Financing, and (b) Contributing to a more equitable social contract. Energy is considered as one of the key elements for both pillars; fiscally sustainable energy sector is a pre-requisite for macro-fiscal stabilization of Sudan, and energy is one of the basic services that the GoS need to strengthen. It also aligns with the broader WBG Climate Change Action Plan.

C. Proposed Development Objective(s)

16. The development objective is to increase availability of and access to electricity services in Sudan.

Key Results (From PCN)

17. The following indicators are the key preliminary PDO indicators:

a. People provided with new or improved electricity service
b. Public institutions with new or improved electricity service
c. Generation capacity of energy constructed or rehabilitated (MW)P
d. Projected electricity savings (MWh)

D. Concept Description

18. The project is structured around four components to support the implementation of the ESRRS. Component 1 will increase the availability of electricity to grid-connected users through reducing distribution losses, managing electricity demand, and deploying distributed solar-based generations for critical public services, as well as the provision of critical spare parts to optimize power generation. Combination of these interventions, in combination with tariff reform, is expected to reduce the demand-supply shortage that the country is facing. Component 2 will support the population without access to the national grid, in particular in post-conflict areas, through improving the electricity services in regional capitals and providing off-grid solar solutions for households, productive users and public institutions. Component 3 will pave the path for Sudan's clean energy transition through enhancing readiness of renewable energy projects in the pipeline. Component 4 will support key reforms in the sector and build its capacity.

Component 1: Optimization of Electricity Supply and Usage (US$ 150 million)

19. Component 1 aims to support the electricity sector respond to the ongoing power crisis in Sudan through a combination of loss reduction, demand management, the provision of solar PV – and battery energy storage systems (BESS) to critical public services, improved power system operation and the upgrading of the systems of the National Load Dispatch Center.

Component 2: Enhancing Access to Off-grid Electricity Services (USD$ 123 million)

20. This component will support provision of new or improved electricity services through off-grid solutions including solar home systems (SHS), standalone solar PV systems and mini-grids, particularly in post-conflict areas such as Darfur, Kordofan and Blue Nile regions.

Component 3: Development of Renewable Energy Program (US$ 10 million)

21. **The component will support GoS to implement the initial phase of renewable energy program. T**he component will support the activities needed to prepare priority projects to be ready for financing and development through public financing or by the private sector.

Component 4: Capacity Building, Project Implementation and Technical Assistance (US$ 20 million)

22. **The component will support GoS in its efforts to build capacity, project implementation and provide technical assistance.** This includes support to revise the power sector;s legal framework and regulations, the preparation of a least-cost power sector plan, or the development of a National Electrification Plan.

Project Cost and Financing

23. The total project cost is estimated at US$303 million, to be financed by IDA and PHRD. The breakdown of project costs by component and total financing is presented in Table 1.

Table 1 Project Cost and Financing

Components	IDA (US$ million)	PHRD (US$ million)	Total Financing (US$ million)
Component 1 – Optimizing Electricity Supply and Usage	**150**		**150**
Component 2 - Enhancing Access to Off-grid Electricity Services	**120**	**3**	**123**
Component 3: Renewable Energy Development Program	**10**		**10**
Component 4: Capacity Building, Project Implementation and Technical Assistance	**20**		**20**
Total	**300**	**3**	**303**

Legal Operational Policies	Triggered?
Projects on International Waterways OP 7.50	No
Projects in Disputed Areas OP 7.60	No

Summary of Screening of Environmental and Social Risks and Impacts

24. The proposed SETAP will increase the availability of electricity to grid-connected users, providing off-grid solar solutions for households, productive users and public institutions will pave the path for Sudan's clean energy transition through enhancing readiness of renewable energy projects. The project will be implemented throughout the country including historically underserved locations of the Republic of Sudan.

25. The scope of the proposed project will be implemented throughout the country and focuses on key development activities associated with the facilitation of clean energy transition, enhance energy access and strengthen fiscal sustainability of the energy sector within the Country. As stated in the above sections, the main activities of the proposed project will be the installation of solar systems on existing lands and facilities such as government building rooftops and spaces in substation complex; solar-based mini-grids; standalone solar home systems as well as institutional solar systems for public institutions such as education, health, and other public facilities; efficient lightning through technology replacement including replacing of inefficient incandescent/compact fluorescent lamps by LED lamps complemented by

public outreach/information campaigns; Conducting various studies, including feasibility and environmental and social studies and other related studies, as needed, Site comparison and prioritization, Transaction advisor (TA), Market sounding; and lastly consulting services, capacity building program. For most of the proposed activities under each component, a detailed technical choice will be made during the project preparation, depending on the technical feasibility and eligibility of the Trust Fund. Considering the nature and small and medium scale of the proposed project activities, the anticipated adverse impacts associated with the construction and operation phases of the proposed SETP project will be reversible and there are no impacts that will lead to irreversible negative permanent change that will be mitigated or avoided through implementation of appropriate means and best practices. The main silent environmental and social issues arise due to the implementation of activities under component one will be safety risks due to working at height, inappropriate usage of PPE and working procedures. These could result fall from heights, electric shock, electrocution, burns severe injury, fire or explosion while working alone on energized equipment or installations. In addition, maintenance operations typically include both disassembly and reassembly, often involving complicated machinery. This can be associated with a greater risk of human error, increasing the accident risk. furthermore, the project sub components will have an aesthetic impact, health effect due to reflection of solar panel, if placed in wrong direction, health and pollution impact from hazardous wastes due to haphazardly disposal of damaged and used battery and solar panels, and replaced incandescent or compact fluorescent lamps, Flue gas from combustion of the diesel plants contains carbon dioxide and water vapor, as well as pollutants such as nitrogen oxides (NOx), sulfur oxides (SOx) will affect the health and safety of the environment and the community members residing around, land acquisition for installation of solar panels, etc.

26. The implementation of activities under project component two will focus on off grid electrification of households and public facilities such as schools, health centers and community water facilities. The implementation of such project activities such as rooftop PV for public facilities, solar home systems (SHS) and hybridized existing diesel-powered mini-grids with solar PV will result in an environmental and social impact, mainly due to improper disposal of used and damaged batteries, water and soil pollution from fuel spill, safety and health risks, impact on aesthetic quality of the area, etc.

27. The anticipated impact due to the implementation of component 3 project activities will have a wide range of impact significance. If the expected wind and solar project are become feasible at the first phase, like the above two components will generate an impact but as different significance scale which is much higher. The same with an upstream work for rehabilitation of existing hydropower dam. Given the potential size and magnitude of the potential wind, solar and hydropower projects, the quality, and completeness of full and thorough consideration of all potential EHS impacts and risks (direct, indirect and cumulative) will be critical. Component 4, as it intervenes in a project implementation support, monitoring, capacity building on communication, no significant environmental and social impacts are anticipated. However, if there is any change in the project design, Sector legal framework and regulations or Sector Planning (as mentioned above in project description) the requirements of ESF will apply.

28. In addition, for components involved on the existing infrastructure (Hydro Power and Thermal power plant) projects, SEHC will assess ‘legacy’ issues if any according to the Bank’s Environmental and Social Framework and also assess in light of any future project development/implementation especially in private sector participation (companies, financial institutions). Furthermore, the project will prepare appropriate ESRM instruments (ESMF (including GBV/SEA/SH Action Plan), RF, SA, LMP, SEP and ESCP). In addition, the project GRM will be responsive to address labor, Violence Against Children (VAC) and Gender Based Violence (GBV) issues, drawing on national laws and procedures. The project also intervenes in capacity building, project implementation and technical assistance that will support overall project management as well as the sector’s reforms.

29. For the project component involving Capacity Building, Project Implementation and Technical Assistance, the project will also implement the requirement of Environmental and Social Framework. General and sector specific WBG EHS Guidelines (Electric Power Transmission and Distribution, Thermal Power, wind power) will be applied to this project.

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APPROVAL

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