Project Information Document (PID)

Concept Stage | Date Prepared/Updated: 11-Jun-2019 | Report No: PIDC27328

BASIC INFORMATION

A. Basic Project Data

Country	Project ID	Parent Project ID (if any)	Project Name
Tanzania	P169561		Zanzibar Energy Sector Transformation Project (P169561)
Region	**Estimated Appraisal Date**	**Estimated Board Date**	**Practice Area (Lead)**
AFRICA	Mar 02, 2020	Apr 30, 2020	Energy & Extractives
Financing Instrument	**Borrower(s)**	**Implementing Agency**	
Investment Project Financing	Ministry of Finance and Planning of the United Republic of Tanzania	Ministry of Land, Housing, Water and Energy (MoLHWE), Zanzibar Electricity Corporation (ZECO)	

Proposed Development Objective(s)

The Project development objective is to expand access to electricity service and to create an enabling environment for private sector participation in the Zanzibar electricity sector.

PROJECT FINANCING DATA (US$, Millions)

SUMMARY

Total Project Cost	110.00
Total Financing	110.00
of which IBRD/IDA	110.00
Financing Gap	0.00

DETAILS

World Bank Group Financing

International Development Association (IDA)	110.00
IDA Credit	110.00

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

Other Decision (as needed)

B. Introduction and Context

Country Context

1. **Zanzibar is a semi-autonomous region of the United Republic of Tanzania**. Zanzibar is part of Tanzania and has its own legislative assembly, judicial system, and an executive headed by the President[1]. The Zanzibar archipelago consists of two main islands, Unguja and Pemba. The two islands are located roughly 35 kilometers (km) off the coast of Tanzania and are surrounded by a group of approximately 50 islets. In 2012, Zanzibar's population was 1.3 million, 900,000 in Unguja, and 400,000 in Pemba. By 2020, Zanzibar's population is expected to increase to 1.6 million people, given an estimated population growth rate of 3.1 percent per year.[2] Currently, over 60 percent of the inhabitants live in urban areas, and the population density of this island nation is more than ten times higher than in Tanzania-mainland.

2. **The GDP growth in Zanzibar has kept pace with that of Tanzania-mainland in recent years.** In 2017, the estimated GDP of Zanzibar was US$1 billion. The GDP growth rate between 2007 and 2015 was 6.2 percent per annum, about 0.3 percent below the national average.[3] Zanzibar, once the largest producer and exporter of cloves in the world, still relies on exports of agricultural products – cloves and other spices, seaweed, and coconut products, but tourism growth is outpacing all the other sectors. Agriculture was traditionally the backbone of Zanzibar's economy, but tourism has become the main growth driver, contributing to more than a quarter of the GDP and most of the foreign exchange earnings. The number of tourist arrivals has more than doubled over the last decade, reaching about 400,000 arrivals each year. The sector also provides the highest private sector employment.

3. **Over the past years, Zanzibar registered a modest decline in poverty.** In 2015, around 30.4 percent of the population lived below the basic-needs poverty line, down from 34.9 percent in 2010. The decline in poverty was mainly in Unguja (18.4 percent from 26 percent). This was mainly driven evident in the larger urban centers in Unguja, where more than 60 percent of the population lives. Pemba experienced an increase in poverty (55 percent from 48 percent). In contrast more than 80 percent of the population in Pemba lives in rural areas. Most

[1] Tanganyika (Tanzania-mainland) and Zanzibar formed a unity on April 26, 1964 through the Union of Tanganyika and Zanzibar Act of 1964, which led to the formation of the United Republic of Tanzania.
[2] Tanzania-Zanzibar National Population Projections, February 2018. It is estimated that the population will reach 1.6 million inhabitants in 2020, 1.76 million in 2022 and 2.3 million in 2035.
[3] World Bank (2017). Tanzania CPF FY18-22.

of the rural households depend on fishing and agriculture for their livelihood and spend on average 18 percent of their incomes on energy, water, and housing.

4. **The Zanzibar Strategy for Growth and Reduction of Poverty 2016-2020 (ZSGRP III) prioritizes the tourism sector and enabling infrastructure such as energy, water, transport as key drivers of growth and poverty reduction**. The RGoZ's high-level objectives for the development of the energy sector are stated in Vision 2020 and the Energy Policy (2009) under the overarching umbrella of ZSGRP III. The Vision 2020 emphasizes the development and efficient utilization of Zanzibar's locally available energy resources to minimize dependency on imported energy and reduce pressure on natural forests. These documents focus on (i) expansion of generation capacity using sustainable and clean energy sources, and extension/strengthening of the distribution network to meet the growing demand and to serve more customers and (ii) increase of new customer connections, with a focus on women.

B. Sectoral and Institutional Context

Sector governance

5. **The Zanzibar power sector is led by three key players.** The Ministry of Land, Housing, Water and Energy (MoLHWE), the Zanzibar Utilities Regulatory Authority (ZURA), and the vertically integrated utility, ZECO are the main actors in the electricity sector. Key sector legislation includes the ZECO Act (2006) that governs the operations of the utility, and the ZURA Act (2013) establishing the sector regulation.

i. **MoLHWE.** The Department for Energy and Minerals (DoEM) within MoLHWE is responsible for policy setting and overall sector coordination.

ii. **ZURA** established in 2013 is responsible for technical and economic regulation in the water, petroleum, and electricity sectors. ZURA's functions include tariff setting and review, licensing, promoting economic efficiency and performance monitoring of sector utilities, and promoting private sector participation. Although established a few years ago, ZURA is not yet fully operational. It is in the process of developing the requisite institutional capacity to take over the regulatory function by the end of 2020. ZURA is currently completing the first cost of service study (CoSS) for ZECO to inform the RGoZ on the total costs incurred by ZECO in providing electricity service to the different customer categories. Currently any changes to retail electricity tariffs proposed by ZECO are approved by the Cabinet of Ministers of Zanzibar.

iii. **ZECO** is fully owned by the RGoZ through the MoLHWE. Its responsibilities include generation, transmission and distribution, and the sale of the electricity on both Unguja and Pemba. The ZECO Act (2006) gives the utility the mandate to sign Power Purchase Agreements (PPAs) with any public authority or independent power producer (IPP) for the bulk purchase of electricity. The utility is supervised by a five-member Board of Directors whose chairperson is appointed by the President of Zanzibar. The General Manager, who is also appointed by the President, is ex-officio a member of the Board of Directors. The other three members are appointed by the MoLHWE and ZECO management team. ZECO is headquartered in Unguja, with a separate department in Pemba. The utility currently has 756 employees across seven departments and four units.

6. **Zanzibar's Public Private Partnership (PPP) framework is defined by Zanzibar PPP Policy 2014, Zanzibar PPP Act 2015, and the Zanzibar PPP Regulations 2017, along with other relevant regulations.** While the concept of PPP, and its associated laws/regulations, is nascent in Zanzibar, the RGoZ envisions a long-term strategic plan of increasing private sector participation in the finance, design, construction, operation and maintenance of critical infrastructure services. Several PPPs in different sectors, including energy are currently under consideration. According to the Union of Tanganyika and Zanzibar Act, 1964,[4] energy is not a union matter, and Zanzibar has autonomy on sector-related decision-making, including PPPs. However, the Zanzibar electricity sector is fully dependent on Tanzania-mainland. Clear links, if any, to the policies and regulations governing PPPs in Tanzania-mainland must also be considered.

Status of the Sector

7. **Zanzibar relies solely on power supply from Tanzania-mainland.** Both Unguja and Pemba are completely reliant on power purchased from TANESCO through submarine cables of 100 MW and 25 MW capacity, respectively. Unguja was first connected to the mainland national grid in 1980 through a 45MW 132kV submarine cable,[5] which is based on obsolete technology. The new 100MW - 132kV submarine cable (funded through an MCC grant) was installed in 2013, when the demand for electricity was approaching its maximum capacity. The cable was also approaching the end of its technological life and had started to experience reliability and maintenance challenges. Pemba was first electrified in 1958 and relied on island-based diesel gensets until it was connected to the mainland through a 25MW 33kV submarine cable in 2010 (funded through a Norwegian grant). In 2008 and 2010, Unguja experienced island-wide blackouts lasting 3-4 months due to faults on the submarine cable, which took long to repair due to the absence of specialized maintenance contractors in the region. The extended blackouts had an immense negative impact on the island economy. Although both submarine cables are relatively new and have improved reliability of supply, the risk of extended supply outages remains a reality due to faults that may occur on the submarine cables. As a partial mitigation against this risk, ZECO maintains 25MW of grid-connected high-speed back-up diesel generators. Most hotels, offices, industries, and various private sector consumers have their own captive emergency diesel generators.

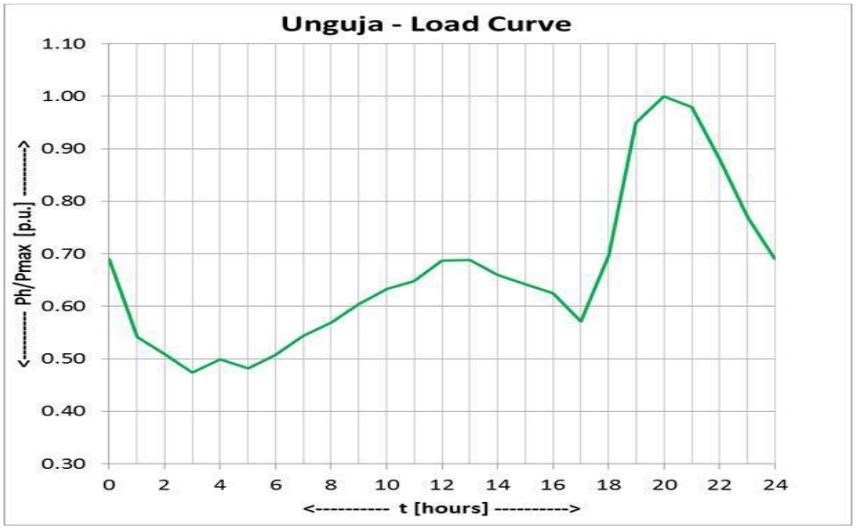
8. **The backbone network in both islands comprises of 33kV and 11kV lines.** The Unguja distribution network comprises 621km of 33kV lines and 119km of 11kV lines, while Pemba has 293km of 33kV lines and 114km of 11kV lines. Stone Town, located in Unguja, has about 30km of underground 11kV cables. ZECO owns and operates about 73km of 132kV submarine transmission line from Ras Kilomoni (near Dar es Salaam, the entry point of the submarine cable), to Fumba (landing point for the submarine cable), to Mtoni (the main 132/33kV substation on Unguja). There are three main substations in Unguja: one 132/33kV at Mtoni and two 33/11kV substations. The existing network is old, inadequately maintained, poorly configured and consists of long radial lines resulting in significant and frequent reliability and supply quality issues. About 60 percent of ZECO's transformers are overloaded and have LV feeders that are often longer than technically optimal.

4 The 1964 Act provides main foundation of the Constitutions of the United Republic of Tanzania of 1977 and the Zanzibar Revolutionary Government of 1984. The Articles of the Union were signed on April 22, 1964 by the Founders of the Union, Julius Nyerere and Abeid Amani Karume and agreed in 11 matters which later increased to over 22 and are the source of tension and dispute between Tanzania-mainland and Zanzibar.

5 Prior to this facility, the island was reliant on expensive island-based diesel generators.

9. **Power outages are frequent in Zanzibar and affect businesses and households.** The number of unplanned outages averaged 93 and 54 per month in 2018 on Unguja and Pemba, respectively.[6] Power outages, planned and unplanned, on average last for an average of 75.8 hours per month. Frequent disruption impacts the growing tourism sector and other industries, forcing investment in expensive and polluting back-up diesel generators, and increasing the cost of doing business. Poor record keeping practices and the lack of system-wide communication and data acquisition prevent a systematic analysis of reasons for outages. Further, an incomplete asset register impedes preventative maintenance and planning for future investments, and key data necessary or analyzing technical, operational and financial functions are often unavailable or inconsistent.

10. **Electricity demand in Unguja is growing rapidly and the existing 100MW submarine cable is projected to reach its maximum capacity in the next three/four years.** Driven by the tourism sector, electricity demand on the island has registered rapid growth in recent years – about 6 percent per year. Given the demand profile, the load curve has a substantial evening peak – almost 1.5 times of the mid-day peak. The recorded peak demand for Unguja and Pemba was 76.5 MW and 10MW respectively in 2018. The peak demand typically occurs in the evening between 6pm and 10pm. In 2018, electricity consumption was 371 GWh, implying a per capita consumption of about 285 kWh – more than double that of 2009. Households comprise around 85 percent of the total customer base and around 62 percent of the total power sales. Medium and large industrial consumers account for a total of 1,844 connections (about 1 percent of connections) and around 40 percent of the total electricity consumption.



11. **ZECO buys power from TANESCO under separate PPAs for Unguja and Pemba.** The PPA for Unguja was signed in 2010, while the one for Pemba was signed in 2008. ZECO pays TANESCO a bulk-supply tariff that is based on the regulated tariff for high-voltage large industrial consumers (Category T3) in Tanzania-mainland. The regulated tariff consists of an energy (per kWh) and a demand (max kVa per month) charge. Actual tariff paid is negotiated between TANESCO and ZECO. The utility depends primarily on electricity sales for its revenues, with around 17 percent of total net revenues related to penalties, reconnection fees, and

[6] ZECO Masterplan-approved July 2017

amortization of grants. At the present tariff levels, planned network investments for ZECO will have to be funded through government transfers and grants.

Sector challenges

12. **Half of the population in Zanzibar remains without electricity.**[7] About 82 percent of ZECO's customers are in Unguja. An average of 12,600 connections have been added annually over the past five years, implying approximately a three-percentage point increase in the access rate every year (not accounting for population growth rate). The RGoZ has set the objective of universal access by 2032, with a midstream target for 2020 of 61 percent for Unguja and 38 percent for Pemba. While the 2020 targets are unlikely to be met, there is a concerted effort to strengthen and extend the electricity network in both islands, including the introduction of a 132kV backbone for Ugunja line and network densification that will facilitate the achievement of these the targets. However, demand-side constraints hamper take-up of connections, especially by poorer households. Currently, connection charges are about TZS300,000 (US$133) for a "no-pole" connection, and even more if poles are needed.[8] In recognition of the inability of most customers to pay the upfront charge, ZECO has been allowing customers to pay the bill in installments over time.

13. **Technical and non-technical losses (19%) are a significant source of inefficiency in power supply for ZECO.** To tackle commercial losses, ZECO is currently in the process of converting all customers post-paid meters to pre-paid meters and investing in Automatic Meter Reading (AMR) systems for large power users. At present, 89 percent of residential customer meters have been converted to pre-paid meters. The reduction in technical losses is being tackled through network upgrades that are guided by ZECO's Electrification Master Plan (EMP).

14. **ZECO had built up arrears to TANESCO.** To address this, ZECO and ZMoFP have put in place a repayment plan to pay off the arrears through monthly payments. The expectation is to pay off all the arrears by December 2019. ZECO's payable arrears are closely related to its receivable arrears – especially from large government customers such as the Zanzibar Water Authority (ZAWA). ZAWA is ZECO's largest customer, accounting for about 10 percent of revenue share.

Proposed Project

15. **Zanzibar has pro-actively adopted the goal of supporting private participation in power generation.** Zanzibar launched an EU-financed wind and solar resource measurement campaign in 2015. The resource measurement was completed, and a preliminary feasibility study outlined the solar resource across five sites – three on Unguja and two on Pemba[9]. Based on this study, the RGoZ has decided to pursue the development of a 30 MW solar PV generation initiative as a first step towards meeting its energy security objectives. Following a Bank dialogue to promote PPP for the renewable energy/solar PV development in Zanzibar, Sida funded a rapid assessment of PPPs in Solar PV, to inform the RGoZ decision. Based on this, the Cabinet of Ministers of Zanzibar made a decision to engage the private sector to develop the solar PV facility as an Independent Power Producer (IPP). The proposed project thus supports the RGoZ to create an enabling environment for the private sector participation in the planned Solar PV development.

[7] This is how the RGoZ defines as "connectivity". According to the RGoZ definition access is the presence of grid infrastructure in the village. According to this definition access is 81.6 percent.
[8] Any addition wooden pole translates into additional cost of between about TZS 800,000-1,000,000.
[9] The wind measurement campaign failed due to equipment malfunction.

16. **Zanzibar is committed to addressing unreliable and inadequate power supply that has a negative impact on household and commercial customers and is constraining growth in the tourism industry.** Dilapidated distribution system assets cause high technical losses, thereby preventing the service of increased power load, especially in Stone Town and coastal areas, where the tourism activity is growing fast. At present some of the transformers have available capacity while others are saturated. Some new distribution transformers along with investment in MV and LV grids will be required to cater for the increased loads going forward; integration of new renewable energy capacity and extend connectivity. The proposed project therefore will also support the RGoZ to meet its aspiration of expanding access to clean, reliable, secure, and good quality electricity supply - upgrade, strengthen, and extend the existing electricity network as well as increase access to electricity in urban and rural areas.

C. Proposed Development Objective(s)

17. The Project development objective is to expand access to reliable electricity and to create an enabling environment for private sector participation in the Zanzibar electricity sector.

Key Results (From PCN)

(i) People with access to electricity (*number*);
(ii) Capacity of solar PV generation that reached financial close (*MW*); and
(iii) Capacity of grid-connected battery energy storage installed (*MWh*).

D. Concept Description

18. **The proposed project is aligned with Zanzibar's energy sector development and electrification goals of developing locally available energy resources and achieving universal access to reliable electricity by 2032.** The proposed project will increase access to electricity for households, commercial, and industrial users, and public institutions in the rural, peri-urban and urban areas through on-grid solutions. The proposed project will support investments to: (i) enable the connection and evacuation of domestically generated renewable energy; (ii) create an enabling policy and regulatory environment for private sector participation in renewable power generation and improve supply quality and efficiency/reliability of the electricity network, and (iii) provide technical assistance and management tools to ZECO skilling and capacity building activities within relevant RGoZ ministries/entities: ZMoFP; MoLHWE, ZECO, ZURA and ZEMA.

19. **The Bank financing instrument is the Investment Project Financing (IPF).** The IPF has been selected as it is considered an effective instrument for a client whose implementing capacity is deemed weak and will be implementing a Bank financed project for the first time. Further assessments will be carried out during project preparation to determine the type of technical assistance and capacity building needed to enable effective and timely implementation of the proposed project.

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

Preliminary assessment does not indicate high reputational and/or political economy risk that could adversely influence or hinder the project from achieving environmental and social standards compliance. This will further be assessed during project preparation.

Note To view the Environmental and Social Risks and Impacts, please refer to the Concept Stage ESRS Document**.**

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APPROVAL

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