

Renewable Energy in Africa

EDITION 2



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DLA Piper in Africa

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Introduction

Renewable energy in Africa

The African continent, with a population exceeding one billion people and an estimated combined economy of USD1.5 trillion,¹ presents huge opportunities for investors, developers and operators across the renewable energy sector.

Renewable energy is already giving millions of people in Africa access to electricity for the first time. However, across the continent over 640 million Africans still have no access to electricity. Approximately only 40% of the population have access to electricity. Per capita consumption of electricity in sub-Saharan Africa

(excluding South Africa) is 180kV compared to 13,000kWh per cap the US and 6,500kWh in Europe.

Generation and distribution of electricity is fundamental to unlocking economic potential, with the development of renewa energy projects and innovative electricity distribution strategies central importance to the delive of the economic and socio-politi objectives of central governmen

As we reported in our previous edition, activity in the sector has and continues to grow rapidly, reforms to energy markets in **Angola** and **Botswana** highlights the drive with countries such as **Ghana** and **Kenya** each adding hundreds of MW of central governments to provide

¹ Statistics from the World Bank Databank, May 2018 (figures relate to Sub-Saharan Africa).

² Statistics from the Africa Development Bank, May 2018

| Wh, | of increased production through |
|---------|--|
| pita in | recent or soon-to-be operational wine |
| 2 | and solar plants. Ethiopia , with the |
| | support of the International Finance |
| | Corporation, recently initiated Round |
| | 2 of Scaling Solar seeking to cover six |
| | new projects with a total capacity of |
| able | up to 750MW. Ethiopia is the fourth |
| | country in Africa to join the IFC's |
| s of | Scaling Solar programme. Uganda |
| ery | and Zambia , like the more establishe |
| ical | programmes in Ethiopia and Kenya |
| nts. | are encouraging the development of |
| | geothermal energy projects. |
| 5 | The recent implementation of legal |
| | reference to operative markets in Angela |

legislative support for ambitious id renewable energy development initiatives.

There is the potential for significant further growth – the African continent is rich with the resources needed to produce renewable energy, including solar, there is an estimated 10TW of potential capacity or ed more. It is therefore unsurprising that many investors, developers and entrepreneurs continue to prioritize African markets and the vast and diverse opportunities which they represent for the renewable energy sector.

The guide

DLA Piper is proud to release the second edition of Renewable Energy in Africa, updating the many changes that have occurred since our last edition. This publication remains an ambitious task, seeking to summarize each country's regulatory environment for renewable energy, highlight the key policy objectives for national governments and provide insight into the projects which are expected to deliver these goals. The guide showcases the diverse approach to renewable energy being adopted across the African continent, and the legal, economic and technological developments being implemented in the following countries:

ANGOLA

The Angolan government's proposals to facilitate USD18 billion of investment in renewable energy by 2025 are an ambitious vision for addressing the impact felt from the rebalancing of the global oil market. A program of hydroelectric generation

projects supported by interconnectors hydro and solar power projects for the country's existing distribution currently under construction are networks are intended to enhance anticipated to increase capacity by 300MW by 2020, helping to boost capacity over the coming years. access to electricity from levels which are currently among the lowest BOTSWANA globally.

Legislative changes introduced in 2016 have opened the country's energy market to independent producers. However, the development of renewable energy projects backed by private investors in a country historically dependent on state production remains challenging for the recently formed Botswana Energy Regulatory Authority.

BURUNDI

A landlocked country at the heart Electrification Programme that aims of Africa's Great Lakes Region, to attain universal access to electricity Burundi holds significant potential through a combination of on-grid and for the development of renewable off-grid systems. energy which the government's "Burundi Vision 2025" framework GHANA seeks to utilize in order to develop Despite established renewable energy production facilities and a widespread sustainable ecological growth. A number of national and regional distribution network providing 82.5%

ETHIOPIA

Although the dominant energy source in Ethiopia is hydropower, which represents 90% of the installed generation capacity, the Ethiopian government is seeking to diversify with increased investment in wind and geothermal production technologies which is recognized as crucial to support the government's National

of the population with access to electricity, Ghana's power demands continue to outstrip supply; however, installed capacity had increased as at the end of 2018 to 4,562MW to help meet the growing requirement, proposals to develop a number of wind and solar farms are being implemented with a 225MW wind farm under development and a 100MW solar project proposed for the Upper West Region of the country. In September 2018, a further 20MW solar plant was commissioned at Gomoa Onyadze in the Central Region of Ghana.

KENYA

The enactment of the Energy Act, 2019, will see KPLC's monopoly broken as electricity distribution and retail supply may be carried out by other players. This move is expected to result in an increase in competition in the distribution and retail supply of electricity and improve the quality of service in the

power sector. Additionally, the Kenyan government in partnership with the World Bank, launched the Kenya National Electrification Strategy (KNES) in December 2018, which provides a roadmap for universal access by 2022.

MAURITIUS

Formation of the Mauritius Renewable Energy Agency in 2016 has provided a focus point for the further development of renewable energy sources to support the country's stable, investor-friendly economy. The home solar project was launched in May 2018. This project aims at installing solar photovoltaic systems on rooftops of 10,000 households in Social Category tariff 110A as part of the Mauritian government's efforts to alleviate poverty while contributing to the national target of achieving 35% of renewable electricity in the energy mix by 2025.

MOROCCO

Morocco is highly dependent on imported hydrocarbon energy to generate electricity, with approximately 96% of its energy needs being sourced externally.

To meet the increasing local demand, Morocco implemented a new energy strategy in 2009, aiming to secure its supply, to ensure power was priced competitively and to protect the environment by using local energy resources, including renewables. Morocco has committed to increasing the share of renewables in its energy mix to 42% by 2020, then rising to 52% by 2030,

MOZAMBIQUE

The country's objective of enabling access to electricity for 50% of the population by 2023 and universal electricity access by 2030 is coupled with its strategic policy of developing the renewable energy sector.

The government has commissioned a Renewable Energy of Mozambique Atlas and an accompanying portfolio

of potential development sites, which of the government's intention to tap highlight the potential of the country's into the country's renewable energy renewable sector. Tariff regimes, potential in order to achieve its tax benefits and regulatory measures objective of generating 20% of national are currently under development electricity supplied from renewable to provide a legal and economic sources by 2030. Noteworthy is the framework to attract investment. recently consummated debt financing transaction wherein North South Power Company Limited raised NAMIBIA over NGN8.5 billion from a green Namibia's vast potential to support solar and wind power electricity infrastructure bond. This is the first generation is seen to be an effective certified green corporate bond and the longest tenured (15 years) corporate means of limiting the impact of climate change and providing a bond issued in the Nigeria debt capital markets.

platform for the country's socioeconomic development. Completion of the country's first wind farm will complement the solar and hydro schemes already in operation, improving the diversity of renewable technologies being utilized in Namibia.

NIGERIA

The Nigerian government's execution of Power Purchase Agreements with a total value of USD1.76 billion will facilitate the generation of an additional 1,125MW of solar power. The program gives a clear indication

SENEGAL

Economic growth in Senegal has recently accelerated, reaching about 6.5% in the past two years, making Senegal one of the best performing economies in Sub-Saharan Africa. Government policy has set the objective of achieving a non-biomass commercial energy independence rate of at least 15% by 2025, due to the contribution of renewable energies and biofuels.

SOUTH AFRICA

Although it provides a regulatory and economic framework which is attractive to private investment, South Africa's electricity market remains highly concentrated, with the state-owned Eskom responsible for the generation and transmission of 95% of the country's electricity consumption. Recent attempts to implement the government's Renewable Energy Independent Power Producer Procurement Programme have brought Eskom's role in the market under increased political and judicial focus, the full consequences of which are yet to be determined.

TANZANIA

With access to electricity currently standing at 36% of the population, the Tanzanian government's Power Systems Master Plan seeks to improve generation and transmission infrastructure in a manner that utilizes the country's significant renewable energy resources. In order to support this objective, the country's regulatory system allows and encourages private investment, helping to stimulate the market for hydro and solar schemes.

UGANDA

Uganda's renewable energy resources are estimated to provide the potential for 5,300MW of additional capacity. Despite a range of operational biomass, hydro, solar and geothermal production plants, this potential remains largely unexploited, putting pressure on efforts to keep pace with growing electricity demand and the government's target of achieving a rural electrification rate of 22% by 2022. Uganda has developed standardized power purchase agreements and is developing a renewable energy feed-in-tariff as instruments to help promote privates sector participation in the generation of electricity from renewable sources.







ZAMBIA

This year saw ZESCO apply to the Energy Regulation Board for an upward adjustment of its electricity tariffs citing prevailing economic conditions, system customer base expansion, and the rising cost of power from its new infrastructure and independent power producers (IPPs) as the underlying factors. The application is yet to be determined by the ERB. The outcome of the "cost of service" survey into electricity tariffs in Zambia is still awaited, it is unclear when this will be available.

ZIMBABWE

Zimbabwe faces electricity supply challenges as a result of aging generation infrastructure and increasing demand. The country's strong potential for hydro and solar schemes is seen as key to the successful development of a diversified electricity generation which enables Zimbabwe to meet its target of reducing emissions by 33% (relative to a business as usual baseline) by 2030.

Conclusion

No publication can fully capture the breadth and diversity of the opportunities which the African continent offers for the renewable energy sector. However, we hope this guide provides an introduction to the key aspects of the legal framework and commercial activity in the 17 countries presented. We would welcome any feedback on this publication and we would be happy to discuss the changing landscape of these countries at any time.

If you have a specific query concerning renewable energy in Africa, we would be very pleased to discuss it with you; we have experienced teams in each jurisdiction, spanning all aspects of the renewable energy sector.

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Angola – Overview



Angola

Overview

KEY FACTS

Jurisdiction: Civil law jurisdiction; however, in many areas of the country traditional customary law still plays an important role.

Language(s): Umbundu, Kimbundu, Kikongo, Tchokwe and Ovambo are national languages, whereas Portuguese is the official language in Angola.

BUSINESS ENVIRONMENT

2018 Doing Business Report:

A vast country with a long coastline and central plateau, Angola thrusts inland across Southern Africa to border Namibia, Botswana, Zambia, and the Democratic Republic of the Congo. Angola is struggling with the rebalancing of the global oil market. Oil represents about one – third of its GDP and over 95% of its exports, and the sharp and prolonged decline in its price since mid – 2014 has had a significant impact on Angola's economy. Reduced revenues have caused GDP growth to decelerate from an annual average of 10.3% (from 2004 to 2014), to only 1.5% (since 2015); this has negatively affected non-oil revenues as well. The government has reacted by cutting

175 of 190 (up 7 rankings) 2018 Global Competitiveness Index: Not yet ranked 2017 Index of Economic Freedom: 165 of 180 (down 9 rankings) 2016 Corruption Perceptions Index: 164 of 176 (down 1 ranking) 2016 UN Development Programme Human Development Index: 150 of 188 (down 1 ranking) Population: 29.78 million GDP per capita 2017: USD6,800

PROFILE

expenditure and increasing non-oil revenue, as well as by devaluing the kwanza.

Electricity Industry Overview



Electrification rates in Angola are currently estimated at 43% in cities and less than 10% in rural areas, consequently there is a high dependence on diesel generators for electricity generation. The generator business and maintenance of such generators is a very profitable business in Angola, which means that efforts to reduce dependence on this industry are reduced.

The Angolan government has an ambitious action plan for the period up to 2025 with around USD18 billion worth of investments into renewables underway, and it has a long-term vision for the power sector with a clear roadmap to provide modern electricity services to 60% of the population by 2025. Through the Presidential Order no. 11/17 of February 14, a multisectoral commission was created to review and extend the vision until 2050 of the long-term development strategy, coordinated by the Minister of Planning and Territorial Development, and

through the Joint Order no. 426/17 of August 17 the technical support group for the multi-sectoral commission was created for the review and extension of the vision until 2050.

The 2013-2017 action plan for the sector is mainly focused on increasing generation capacity, with three mains customers expected to gain access structuring projects (Cambambe to electricity by 2017, mostly through Hydropower Plant; Soyo's Natural Gas Combined Cycle Power Plant and Laúca Hydropower Plant). These three The Transformation Program for the projects represent an increase in power of 3.5GW, more than the total power Electricity Sector (PTSE) is already underway and the main objectives of currently installed and a significant reduction in average generation this program are: cost. The action plan also envisages • to ensure the economic and a strong investment in transmission, with the interconnection of the north, central and south systems by the end • to promote the entry of private of 2017 (started with the Cambambe Hydropower Plant whose work is the sector through an attractive already completed) and the creation of a compensation regime based on new system in the East, interconnecting PPAs with differentiated feed-in the capitals of Lunda Norte, Lunda Sul tariffs for specific cases and the and Moxico. More than 6,000 km of

very high voltage transmission lines and over 40 substations are planned. Finally, on the distribution level, more than 600,000 new connections are planned in Luanda as well as a high level of investment in the electrification of the remaining capitals of the provinces and municipalities, with a total of two million usage of pre-paid meters, representing a greater than 40% electrification rate.

- financial sustainability of the sector;
- capital and private know-how into

creation of the Unique Buyer, being the entity responsible for the purchase of energy from the related producers and the sale of energy to the related distributors. The Unique Buyer will acquire all the energy produced in the public system;

- to ensure Rapid Assessment and Gap Analysis Angola restructured the current organization through the creation of unique public entities for each of the sector's domains:
- **Production** through the incorporation of **PRODEL E.P.**;
- **Transmission** through the incorporation of **RNT E.P.**
- **Distribution** through the incorporation of ENDE E.P.; and

• to reinforce the role of the Regulatory Authority for Electricity and Water Supply and Wastewater Sanitation (IRSEA), in the new market model.

The Angola Strategy 2025, with the strategic objective of harmonious development of the national territory through a balanced geographical distribution of economic and social activities, investments in the electricity sector will be crucial to achieving this. The initial phases of this strategy have been concluded with the outputs being: confirmation of the planned new market model, and the restructuring of the new public companies. The final phase will focus on the design of the new operation model, and implementing the operational improvement plan. Despite the ongoing transformation process, the sector's public companies do not have sufficient human (insufficient training) or technical resources to guarantee the strategy's

implementation within the proposedtimescale or to ensure the efficientexploitation of the current and futureinfrastructures.

The Ministry of Energy and Water (MINEA) projects:

- Regarding of expansion of access to electricity in urban areas, municipalities and rural areas:
 - The access objective is to achieve a 50% electrification rate in 2022 and electrify 2.6 million customers by 2022.
 - The equity objective is to ensure a minimum provincial electrification rate of 20% by 2022 and extending the Public Electricity System to 106 municipal seats.
- Regarding the optimization and sustainable management of the electricity sector:
 - The production objective is to exceed 5.4GW of power

available in 2022 by PRODEL and degree of coverage of the consumption tip in all systems exceeding 30%.

- The transport objective is transporting at least 700MW from the Nothern System to the remaining and to ensure in Annual Interruption Average Time at Very High Voltage less than 900 minutes.
- The distribution objective is to reduce BT customers in "postpaid" to less than 50,000 and transfer all MT customers to metering and to reduce total losses in distribution to less than 25%.
- Regarding the private participation in the Electricity Sector:
 - The thermal and hydroelectric production objective should exceed 1.5 GW of installed power with private investment in 2022.

- DEL
 The new and renewable energies objective is to reach the 500MW of installed power in Solar, Wind, Biomass and Mini Hydric until 2022.
- The Municipal and Rural
 Distribution Objective is to
 develop at least 40 distribution
 licenses in isolated systems and
 100,000 individual solar systems
 imported and distributed/
 marketed.
 - Regarding the expansion of water supply in urban areas, municipalities and rural areas:
 - The supply objective is to achieve a urban coverage rate of 85% in 2022; a production of drinking water at provincial and municipal headquarters from 0.8 million m³/day in 2017 to 1.8 million m³/day by 2022; to achieve a rural coverage rate of 80% in 2022 and an operational rate of water supply systems in operation of 88% by 2022.

- Regarding the sustainable water sector management:
 - The management companies objective is 19 full management companies in 2022.
 - The basin planning objective is 18 main hydrographic basins with a basin plan, including the transboundary basins.
 - The combating drought objective is to increase the network of hydrometric stations to 100 and to conclude the studies.
 - The water quality objective is 18 water quality testing laboratories in 2022 and water quality monitoring program, meeting more than 60% of the needs.
- Regarding the construction of wastewater collection and treatment systems:

- The wastewater treatment objective is to conduct studies leading to the implementation of wastewater collection systems in all provincial capitals and to start the construction of the wastewater collection and treatment system in four of the province capitals.
- Regarding the reinforcement of more than 750,000 m³/day of water tratement in Luanda by 2022:
 - Installation of Ramiros WTP Compact with 1.034 m³/day and Cabala WTP Compact with 144 m³/day.
 - Continuity of construction of new CD's in the scope of new water supply systems (Bita and Quilonga Grande).
 - Expansion of installed nominal capacity of Kifangondo WTP from 140,000 to 210,000 m³/day (+70,000 m³/day).

- Expansion of installed nominal capacity kilamba WTP from 40,000 to 120,000 m³/day (+80,000 m³/day).
- Expansion of installed nominal capacity calumbo WTP from 51,840 to 86,400 m³/day (+34,560 m³/day).
- Ampliation of the water reserve capacity of CD's Cazenga, Mulemba, Golfe, Viana, Nova Vida, Benfica II, Camama, Capari, Funda Km9, Panguila and Catete.
- Construction of the 4/Bita System with a nominal installed capacity of 259,200 m³/day.
- Construction of the 5/ Quilonga Grande System with a nominal installed capacity of 500,000 m³/day.
- Angolan utilities are members of the Southern Africa Power Pool (SAPP) and the Central Africa Power Pool (CAPP). Angola intends to integrate into SAPP through the development and implementation of power generation projects with a regional impact, namely the Laúca Hydroelectric Power Plant, the Soyo Combined Cycle Plant, the Cambambe I and II hydroelectric plant and the Hydroelectric of Caculo-Cabaça. Angola also intends to develop the interconnection of the transmission line with Namibia, to initially provide electricity to cities in the south of Angola. There is also the intention to integrate the Baynes Hydroelectric Plant into NAMPOWER and RNT-EP electric networks, whose studies are underway and are expected to be concluded in 2019. Angola provides for the interconnection of the North/ Center systems through line a 220kV, expected to be completed in 2018 and through the 400kV line, with a forecast in 2019. The interconnection of the

Center/South systems, with a 400kV line, is expected to be completed by 2020.

SAPP integration faces some challenges, including the absence of a common regulatory framework; the fact that energy integration processes are linked to economic integration; the asymmetries in the electricity market and the characteristics of the transmission networks and production capacity; a huge increase in demand and the delay in the development of projects that aim to increase the transmission capacity of the networks. With the creation of the Regional Master Plan for Infrastructure Development (CAPP) SAPP intends to start financing projects related to the improvement of networks.











Electricity Laws

- General Electricity Law Law No. 14 A/96 of May 31 (with the amendments of Law No. 27/15 of December 14).
- The General Electricity Law codified the sector restructuring and established a legal framework for independent power generation.
- Electric Energy Selling Rates Executive Decree No. 705/15 of December 30.
- The Regulation of the Tariff (Presidential Decree No. 4/11 of January 6) determines the criteria and methods for the formulation of tariffs and prices of electric energy to be practiced by the entities covered by it.
- Regulation on access to grids and to the interconnections – Presidential Decree No. 19/11 of January 17.
- Regulation on the Quality Scheme for the service provided by the entities of the public electric system – Presidential Decree No. 310/10 of December 31.

- Models of concession contracts and models for the purchase and sale of November 22.
- Regulation of the licensing of electric power production, transmission and distribution facilities – Decree No. 41/04 of July 2.
- Regulation of the licensing of facilities for the use of electric power – Decree No. 40/04 of July 2.
- Regulation of Electricity Production Decree No. 47/01 of July 20 (established the legal regime production of electric power in the public electric system).
- Regulation of Electricity Distribution Decree No. 45/01 of July 13.

electricity for small hydroelectric power stations – Presidential Decree No. 82/10 of

- Regulation of the Electric Power Supply Decree No. 27/01 of May 18 (establishes the regime of the supply of electrical energy in very high voltage, high voltage, medium voltage and low voltage to electrical facilities).
- Presidential Decree No. 2/11 of January 5 (approved the Regulation of Commercial Relations between the all entities, state and private, involved in the activities of production, transmission, distribution and use of electricity).
- Presidential Decree No. 305/14 of November 20 – created the Public Company of Energy Production (PRODEL E.P.), the company National Electricity Transmission System (RNT, E.P.) and the National Electricity Distribution Company (ENDE, E.P.)
- The new Private Investment Law, which entered into force on June 26, 2018, establishes the principles and general bases of private investment in Angola, establishes the benefits and facilities that the Angolan

state grants to private investors and the criteria for access to them, and establishes the rights, duties and the guarantees of private investors. There are two investment regimes which are the prior declaration and the special regime. The special regime applies to the investments made in the priority sectors of activity and in the development zones provided for in the law. The production and distribution of Electric Energy is considered by the new law as a priority sector. The tax benefits are better if the investment is made under the special regime.

Presidential Decree No. 250/18 of October 30, which entered into force on the same day and revoked Presidential Decree No. 182/15 of September 30 and Presidential Decree 164/17 of July 12 approved the Regulation of Private Investment Law (Law No. 10/18 of June 26).

Regulators

The main regulator is IRSEA, which regulates the production, transmission, distribution, and use of electric energy in the public electric system and regulates the commercial relationship between this system and the agents which are not bound by it. The Presidential Decree of IRSEA does not specify which agents are not bound by it but according to the Law 27/15 of December 14, only concessionaires and those established through a license which aim to supply under a public service regime are considered as related entities.

Generation, Distribution and **Transmission**

In 2014, with the USD1 billion African Development Bank Electricity Sector Transformation Program Loan, Angola made major reforms in the energy sector, including the creation of **PRODEL E.P., RNT – E.P.** and ENDE, E.P.

PRODEL E.P. is the Public Company for Electricity agents that are not integrated into the PES and therefore act outside of this system. Distribution Production and has the responsibility of operating and maintaining the generation is carried out under a public service concession facilities belonging to the state. It integrates or by a license when exercised in isolated Capanga Hydropower Plant, previously under systems. the responsibility of GAMEK, and the generation Angola's transmission infrastructure is made up assets of ENE; the former National Company of Electricity.

of three separate grid systems (northern, central and southern) in addition to isolated grids such as in the east. The northern grid covers Luanda, RNT, E.P.'s main purpose is the transmission of electricity through the operation of the National Bengo, Malange, Kwanza Norte and Kwanza Electricity Transmission System, which comprises Sul. The central grid includes Benguela and the very high voltage grid, interconnection Huambo, and the southern grid serves Huila network, national dispatching facilities and and Namibe. Plans exist to link the grids through related goods and rights, in parallel with the a north-central-south backbone and expand the grid from 3,354 km to 16,350 km by 2025 function of the market operator (sole buyer). and to connect to the pool through Namibia ENDE, E.P.'s main purpose is to distribute and (Baynes) and the Democratic Republic of Congo commercialize electricity at the national level (Inga). All electrical installations must have an in the scope of the public electric system by establishment license and an operating license exploiting the infrastructure of the distribution to be able to lawfully operate in the production, networks in high, medium and low voltage, transmission and distribution space.

under public services. There are a number of agents of the public electricity system (PES) and

Any production of electricity outside of PES, including self-production and private supply, must be developed in accordance with the rules established in the regulations for the licensing and security of electrical installations. Whenever entities outside of PES produce electricity, they must obtain a license or concession. To obtain this, they must first reach an agreement with the entity holding the license or distribution concession in the geographical area where the electro-produce center is located.

Renewable Energy Overview



Angola holds great potential for renewable energy production. Three main steps are being developed to increase the production of renewables in Angola. First, a national renewable energy strategy is being developed in order to identify the best ways to implement the programs and projects of this subject. Secondly, the potential for renewable energies is being identified. Finally the renewable energy project is being implemented, in particular solar photovoltaic systems.

Most of Angola's electricity production comes from small-scale thermal power stations usually located close to urban centers. This is due to the difficulty of implementing adequate infrastructure for energy transmission and the fact that renewable energy is still a new development. The thermal plants include: (1) the Morro da Luz thermal power station in Luanda, which has

been supplying electricity since December 2012; and (2) the Tombwa thermal power station (8MW) in Namibe.

SOLAR

Angola has a high solar resource potential with an annual average global horizontal irradiance between 1,350 and 2,070kWh/m²/year. Angola has a solar potential of 17.3GW, distributed over 368 projects, of which 120 projects, (3,436MW), present conditions for grid connection by 2017. The most appropriate technology to harness the solar resource in Angola is photovoltaic systems.

g Hydropower

According to the Angola Energy 2025 vision, the strategy for new renewable energy sets a target of 100MW for small hydropower plants up to 10MW. Additionally, 270MW of new medium hydro power plants are expected by 2025.

WIND

Angola has a wind potential of 3.9GW,
of which 604MW, or 13 projects,
have conditions for grid connection
by 2017. According to the Rapid
Assessment Gap Analysis provided

by MINEA in September 2015, a total of 12 new locations with favorable conditions for the installation of up to 3.9GW of power were identified. Several of these sites are close to the main network and sub-stations, which have enough capacity to absorb this energy without technical restrictions or significant investments.

BIOMASS

According to the Angola Energy 2025 vision, Angola has a potential for electricity generation based on biomass and municipal solid waste of 3.7GW spread over 42 projects. From these, 3.3GW are forestry related.

RENEWABLE ENERGY GOVERNING LAWS

Resolution No. 19/11 of September 5 approved the adhesion of the Republic of Angola to the International Agency of Renewable Energies (IRENA) and

published the articles of incorporation of the agency. The Presidential Decree no. 88/13 of June 14 established the strategic plan for new environmental technologies, presenting the strategic measures that the DNTA-National Directorate of Environmental Technologies should implement.

Government Incentive Schemes



Currently no fund to support environmental technologies exists in Angola. However, there are in the Customs Tariff, two product codes related to the renewable energy sector in which there is exemption from import duties and consumption tax:

- spark-ignition internal combustion piston engine (wind energy); and
- electric storage batteries, including separators therefore, including square or rectangular: of the kind used in photovoltaic cells (solar cells).

There are also other exempt electrical equipment such as generators and electric transformers.

Major Projects/Companies



- **Ereda** provides services to and promotes the renewable energy sector, especially wind and solar energy. It was selected by the Ministry of Energy and Water of Angola to assist with the development of the national wind and solar atlas and build a 100MW wind farm with 50 wind turbines near the city of Tombwa in the Namibe province. Ereda is also producing a study for the conceptual design, engineering and technical specifications for a large-scale (30MW) hybrid system to electrify Baía dos Tigres island in the Angolan province of Namibe.
- Energias Renováveis de Angola
 - assisted on a design project developed for the implementation of solar projects in 23 dispersed villages in the province of Huambo named Aldeias Solares (Solar Villages).

- The construction of seven power plants, totaling around 200MW, in several Provinces of Angola was carried out by a consortium formed by WinPower, Zagope and Grupo Gema over 2012 and 2013.
- WinPower also contributed to the Project of Aldeias Solares with the supply and the installation of 42 autonomous small-scale photovoltaic systems with inverter batteries, totaling 185kWp.





Foreign Investment/Ownership



There is a new central body for the management of investment processes which is AIPEX – Private Investment Agency and Export Promotion (Presidential Decree no. 81/18 of March 19) and a new Private Investment Law (PIL) (Law no. 10/18 of June 26) and the respective Regulation (Presidential Decree No. 250/18 of October 30).

This new PIL, which entered into force on June 26, 2018, applies to private investments of any value, whether made by internal or external investors and establishes the principles and general bases of private investment in Angola, the benefits and facilities that the Angolan state grants to private investors and the criteria for access to them, and the rights, duties and the guarantees of private investors.

The new PIL repeals the Law no. 14/15 of August 11. According to the old Private Investment Law, foreign

investment in the Angolan electricity sector is only allowed in case of partnership with Angolan citizens with public capital companies or Angolan companies in which they hold at least 35% of the capital and effective participation in the management reflected in the shareholders' agreement. However, the new PIL determines that there is no minimum percentage of mandatory participation of national entities in the share capital; there is no minimum investment value; the criteria for granting incentives; the priority sectors of activity; the

development zones; that the corporate changes are exempt from prior authorization and the immediate right to repatriation of dividends.

There are two investment regimes which are the prior declaration and the special regime. The special regime applies to the investments made in the priority sectors of activity and in the development zones provided for in the Law. The production and distribution of Electric Energy is considered by the new law as a priority sector. The tax benefits are better if the investment is made under the special regime. The benefits conferred Stamp Duty. under this Law apply exclusively to the activities included in the execution of the registered private investment. The development areas (in which the benefits are increasingly attributed) are: Zone A (Province of Luanda and the municipalities that are the

headquarters of the Provinces of Benguela, Huila and the Municipality of Lobito); Zone B (Provinces of Bie, Bengo, Cuanza-Norte, Cuanza-Sul, Huambo, Namibe and other municipalities of the Provinces of Benguela and Huila); Zone C (Provinces of Cuando Cubango, Cunene, Lunda-Norte, Lunda-Sul, Malanje, Moxico, Uige and Zaire) and Zone D (Cabinda Province). The benefits may be granted in Corporate Income Tax (Imposto Industrial); Property transfer tax (Sisal); Real Estate Income Tax (IPU); Investment Income Tax (IAC) and

Whenever the investor, internal or external, intends to carry out operations qualified as indirect investment, these should not exceed the value corresponding to 50% of the total value of the investment.

Supplies from shareholders or partners made for external investment purposes may not exceed 30% of the value of the investment made by the company and are only refundable after three years from the date of registration in the company's accounts.

The investors are already able to incorporate a company under the prior declaration or special regime going directly to GUE-Guiche Hnico da Empresa; however, as aforementioned the benefits are different in both regimes. After the incorporation the investors have to register the company in AIPEX presenting an investment project with all documents that the regulation imposes and when the private investment project is approved will be issued the CRIP -Certificate of Private Investment Registration.

UNFCCC – Paris Commitments and beyond



Angola signed the Paris Agreement on April 22, 2016. In its Intended Nationally Determined Contribution, Angola plans to reduce GHG emissions up to 35% unconditionally by 2030 as compared to the Business As Usual (BAU) scenario (base year 2005). In addition, it is expected that through a conditional mitigation scenario, the country could reduce an additional 15% below BAU emission levels by 2030, In achieving its unconditional and conditional targets Angola expects to reduce its emissions trajectory by nearly 50% below the BAU scenario by 2030 at overall cost of over USD14.7 billion.

Relevant Resources and References



Relevant Websites

www.energycom.gov.gh
www.purc.com.gh
www.ecgonline.info
www.ecgonline.info
www.export.gov
www.gipcghana.com





Botswana

Overview

KEY FACTS

Jurisdiction: Botswana has a dual legal system consisting of customary law that operates alongside the common law. Botswana adopted its constitution upon gaining independence in 1966, with several amendments having been made since, 34 of 180 (down 4 rankings) most recently in 2006.

Language(s): English, Setswana.

BUSINESS ENVIRONMENT

2018 Doing Business Report: 81 of 190 (down 10 rankings)

2018 Global Competitiveness Index: 63 of 138 (up 1 ranking)

2017 Index of Economic Freedom:

2016 Corruption Perceptions Index: 35 of 176 (down 7 rankings)

2016 UN Development Programme Human Development Index: 108 of 188 (down 2 rankings)

Population: 2.3 million

GNI per capita: USD16,380

PROFILE

Botswana is a landlocked country in Southern Africa, famous for its Okavango Delta, the Kalahari Desert and abundant wildlife. It is mineral (diamond) rich and has a democratic and stable political environment, with the Botswana Democratic Party (BDP) having been in power since 1966. With a small population of around two million people, it has been one of the fastest growing economies in the world since its independence from Britain in 1966, with an average growth of 5% per annum over the last ten years. However, it still struggles with unusually high levels of inequality and poverty. Botswana's economic model still needs to evolve to progress as there is a high dependence on the state and little private sector investment.

Electricity Industry Overview



Almost 80% of Botswana's power requirement is imported from the Southern African Power Pool (SAPP), mostly from South Africa. The Southern African region is currently experiencing a power generation deficit, and as a result, there is a critical need for Botswana to augment the internal generation of electricity. The Electricity Supply (Amendment) Act was amended in 2016 to allow for private sector participation in power generation.

A request for proposals was issued averages 260MW only from Morupule B power station since the Morupule "A" for Independent Power Producers to build, operate and maintain a 300MW plant is undergoing refurbishment. coal power station. Although the The current peak demand stands preferred bidder was selected, at approximately 600MW and the the process appears to have stalled on supply gap is met through imports the government's concerns over the mainly from South Africa (Eskom) provision of guarantees. and some from Mozambique (EDM). The two emergency plants, Orapa The base generation plants in the 90MW and Matshelagabedi 105MW, country currently consist of Morupule are also dispatched when imports are "A" with an installed capacity of 132MW not available or when they are too and Morupule "B" with 600MW. The expensive.

available base generation capacity

Electricity generation and distribution in Botswana is dominated by the Botswana Power Corporation (BPC), the local utility and currently the sole supplier and distributor of electricity.

The government of Botswana (GoB) retains control over electricity tariffs through the Botswana Energy Regulatory Authority (BERA), a brandnew regulatory body constituted on April 1, 2017.

Electricity Laws

- Botswana Energy Regulatory Authority Act No. 13 of 2016 (BERA Act).
- The BERA Act establishes the Botswana Energy Regulatory Authority, its mandate, the regulation of the energy sector and makes provision for matters incidental thereto.
- Botswana Power Corporation (Amendment) Act No. 15 of 2016 The Botswana Power Corporation Act establishes the Botswana Power Corporation for the generation and supply of electric power and makes provision for matters incidental thereto and connected therewith.
- use of electricity).

Electricity Supply (Amendment) Act No. 14 of 2016 – The Electricity Supply (Amendment) Act makes provision for the licensing and control of undertakings for the generation and supply of electricity and for matters incidental thereto and connected therewith.

Presidential Decree No. 2/11 of January 5 (approved the Regulation of Commercial Relations between the all entities, state and private, involved in the activities of production, transmission, distribution and

- Presidential Decree No. 305/14 of November 20 – created the Public Company of Energy Production (PRODEL E.P.), the company National Electricity Transmission System (RNT E.P.) and the National Electricity Distribution Company (ENDE E.P.).
- Informing that the new Private Investment Law has already been approved and in a few weeks will be published. We anticipate that under the new law the requirements regarding the amount invested and the obligation to have Angolan partners will be changed as well as the procedures that will also be different.



Regulators

The only regulator is the Botswana Energy Regulatory Authority (BERA). BERA's role is to provide an efficient regulatory framework for the energy sector. Its primary mandate is the economic regulation of the energy sector in accordance with the BERA Act. BERA oversees the electricity, petroleum products, coal, natural gas, bio-energy, solar energy, renewable energy, resources and other energy sectors. BERA is tasked with ensuring that tariffs in the energy sector are fixed on the basis of a tariff methodology that has been set up in a transparent manner taking into account GoB policy on cross subsidies between classes of consumers, ensuring that the interests between consumer. customer and licensee are adequately balanced, protecting and preserving

the environment and ensuring that the best international regulatory practice is maintained in the regulation of the energy sector.

BERA has the power to regulate:

- tariffs in the energy sector;
- coal supply agreements between collieries, coal suppliers and price-regulated generators;
- license activities in the energy sector;
- network access for independent power producers, privately financed projects in the energy sector;

- transport and storage infrastructure.

energy; and

BERA also monitors and inspects licensees and enforces license obligations, oversees project development in the energy sector and implements policy in relation to the generation of electricity from renewable energy resources. BERA's powers may be subject to intervention by the Ministry of Minerals, Green Technology and Energy Security.

network access and storage

systems access in natural gas

network, gas storage, oil pipelines,

petroleum pipelines and storage

of oil and petroleum products

including third-party access to

Generation, Distribution and Transmission

Generation, distribution and transmission of electricity in Botswana is subject to licensing by BERA. Generation and distribution is currently dominated by the BPC, with only one IPP license having been issued, in respect of a proposed coal fired plant.

Renewable Energy Overview



Save for the 1.3MW solar plant at Phakalane near Gaborone, there are no significant existing renewable energy projects in Botswana, but the focus is on developing solar power, as evidenced by the two requests for proposal (RFPs) in the market for a solar farm to supply Gaborone and to supply electricity to 20 villages The potential for wind power projects is also under investigation; however, despite a plan emerging from Wind Edge Botswana for a 100MW facility in the Kwene district, nothing has materialized to date.

| In October 2017, BPC announced that |
|---|
| it intended to apply for USD200 million |
| from the Climate Change to fund solar |
| projects in the country. |

| 2313 | |
|------|--|
| | The regulatory framework allows for, |
| S. | and encourages, renewable energy, |
| | and the GoB, through BPC, is actively |
| | pursuing potential solar projects. |
| | Two expressions of interest were |
| | released in June 2017 in relation to |
| eng | two new solar projects, a 100MW plant |
| | and a solar-hybrid project (please see |
| | details on page 25). |
| | |

Government Incentive Schemes



Government Incentives

In 2015, the government issued an EOI to construct, operate, maintain, and decommission at the end of its economic life, a scalable 100MW solar power plant. Two new solar EOIs were released in June 2017; one for a 100MW solar plant to service Gaborone and a second solar-hybrid project to service 20 Botswana villages.¹ Botswana has been working with the World Bank to develop a comprehensive renewable energy strategy.²

Major Projects/Companies

| | 4 | \wedge | 2 |
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| 1-1 | | | |
| | | | |

- North West Transmission Grid The project entails the extension of the high-voltage electricity network to the Northwest, Chobe and Ghantsi Districts, catering for new power capacity requirements and connecting areas that are supplied through cross-border power lines to the national grid.
- Construction of Rakola **substation** – The project consists of a 220Kv substation in Rakola as part of a transmission grid network expansion. The project is mainly aimed at reinforcing the transmission network in the southern region of Botswana.

- Morupule B Units 5 & 6 Marubeni Corporation – this project entails the extension of Morupuile B with an additional 300MW coal fired power plant. This will be the first IPP in Botswana.
- **Renewables** There are currently two solar RFPs in the market, put out by BPC; one in relation to a 100MW solar plant which will be used to supply electricity to Gaborone, and one in relation to a solar-hybrid project for powering 20 villages. The bids have been submitted and the process is currently at the evaluation stage.







Foreign Investment/Ownership



Botswana is a stable and welcoming environment for foreign direct investment. There are no restrictions in respect of foreign ownership of energy projects and there are no exchange control restrictions or limitations on the repatriation of funds.

There are no restrictions ofownership of companies in Botswana.The Companies Act provides that atleast one director of the companyshould be resident in Botswana.



UNFCCC – Paris Commitments and beyond



Obligations

- Botswana ratified the United Nations Framework Convention on Climate Change (UNFCCC) in 1994. Botswana signed the Paris Agreement (an agreement within the UNFCCC) on April 22, 2016, and subsequently ratified the Agreement on November 11, 2016.
- In accordance with Article 2 of the Paris Agreement, Botswana has obligations to:
 - hold the increased global average temperature to well below 2°C above pre-industrial levels;
 - increase the adaptability to the adverse impacts of climate change and foster climate resilience and low greenhouse gas emissions in a manner that does not threaten food production; and
 - make finance flows consistent with a pathway towards low greenhouse gas emissions and climateresilient development.³
- Botswana has set itself the goal of reducing its carbo emissions by 15% by 2030,⁴ which would require approximately USD18.4 billion to achieve.

Steps taken under Paris Agreement

• There is no dedicated policy to respond to climate change in Botswana.⁵ The government of Botswana has been working on a climate change adaptation and mitigation policy since 2010, However, the draft policy is yet to be adopted by the parliament.⁶ In pursuit of sustainable development, Botswana has made voluntary commitment in its Vision 2036 to purse green growth and attain green economy, which it can be argued to include reducing use of coal powered power stations in of renewable energy resources.⁷ Botswana's Vision 2036 states "Botswana will have a low carbon footprint, with a society that is aware of and resilient to the consequences of climate change. Our planning and decision-making will take cognisance of vulnerabilities, and provide for implementation of appropriate mitigation and adaption measures."8

Relevant Resources and References



Relevant Websites

www.energycom.gov.gh www.purc.com.gh www.ecgonline.info www.export.gov www.gipcghana.com

References

¹ export.gov 31/07/2017 "Botswana – Energy"

² Team Finland Market Opportunities 25/04/2018 "Botswana– business opportunities for Finnish companies"

³ https://unfccc.int/sites/default/files/ paris_agreement_english_.pdf

⁴<u>https://www.climatewatchdata.org/</u> <u>countries/BWA</u>

⁵ Patricia Mogomotsi, Goemeone
Mogomotsi, and Wsme Hambira,'Paris
agreement on climate change
and Botswana's Vision 2036: an
examination of linkages' (2018)
16 (1) Chinese Journal of Population
Resources and Environment 59, 62.

⁶ Patricia Mogomotsi, Goemeone Mogomotsi, and Wsme Hambira,'Paris agreement on climate change and Botswana's Vision 2036: an examination of linkages' (2018) 16 (1) Chinese Journal of Population Resources and Environment 59, 62.

⁷ Patricia Mogomotsi, Goemeone
Mogomotsi, and Wsme Hambira,'Paris
agreement on climate change
and Botswana's Vision 2036: an
examination of linkages' (2018)
16(1) Chinese Journal of Population
Resources and Environment 59, 63.

⁸ <u>http://www.hrdc.org.bw/sites/default/</u> <u>files/Vision%202036.pdf</u>





Burundi

Overview

KEY FACTS

Jurisdictions: The judicial system in Burundi is based upon French and German customary law. The judiciary comprises of the Court of Appeal, Supreme Court, Tribunals of First Instance and Constitutional Courts.

Languages: French, Kirundi, English and Swahili.

BUSINESS ENVIRONMENT

2018 Doing Business Report: 168 out of 190 economies (Up 4 places)

2018 Global Competitiveness: 129 out of 137 (up 6)

2017 Index of Economic Freedom: 157 out of 180

2016 Corruption Perceptions Index: 159 out of 176 (down 9)

2016 UN Development programme Human Development Index: 184 out of 188 (no movement)

Population: 10,86 million

GNI per Capita: USD770

PROFILE

The years following independence were characterized by instability, massacres took place in 1965, 1972, 1988 and 1993. The current president Pierre Nkurunziza, is a former rebel leader. Burundi sparked a return to unrest in 2015 when he announced a run for a third term. Next presidential elections are to be held in 2020 and the current president has stated that he will not run again for presidency.



Electricity Industry Overview



Burundi Electricity Market

The country's electricity market is traditionally state-owned. Electricity generation and supply in Burundi is managed and administered by Régie de Production et Distribution d'Eau et d'Electricité (REGIDESO), which operates and controls all of Burundi's hydro power plants. They have a combined installed capacity of 30.6MW and a small amount of hydro capacity, in the form of small units in rural areas.

REGIDESO is also responsible for power distribution and water supply in urban areas, the majority of which are located in the country's capital Bujumbura and the surrounding areas. Electricity is transmitted and distributed by REGIDESO, whilst the Societe Internationale des Pays des Grand Lacs (SINELAC), a jointly owned utility with Burundi, Rwanda and Congo, is responsible for the development of indigenous and joint power ventures generating and selling power to REGIDESO.¹

¹ http://fortuneofafrica.com/burundi/energy-sector-profile-in-burundi/

Electricity Laws

- Law No. 1/13 of April 23, 2015 on the reorganization of the electricity sector in Burundi.
- Law No. 1/14 of April 24, 2015 relating to Public Private Partnerships.

• Decree n° 100/130 of June 23, 2016 related to reorganizing the transmission, distribution and marketing of electricity in Burundi.

• Decree n°100/164 of September 5, 1997 harmonizing the REGIDESO Articles of Association with Burundi companies Act.





Regulators

The regulatory authority are:

- the Ministry of Hydraulics, Energy and Mines
- the regulatory authority agency; and
- the electricity generation and supply in Burundi is managed and administered by Régie de Production et Distribution d'Eau et d'Electricité (REGIDESO), which operates and controls all of Burundi's thermal power stations.

Generation, Distributi and Transmission

The legal regimes of the generation transmission, distribution and marketing of electricity in Burundi a separate.

The transmission, distribution and marketing of electricity is an indust and commercial public service und the responsibility of the State.

The production of electricity contril to the public service of electricity b does not constitute as such a public service under the relevant legislation

| tion | The marketing of electricity can |
|--------|---|
| | therefore be carried out competitively |
| on, | under the conditions laid down by |
| | Article 5 of Law No. 1/13. |
| are | Indeed, the power generation |
| | exercise is subject to the public-private |
| 1 | partnership regime; while the activities |
| strial | of operating an electrical installation are |
| der | subject to the simple authorization. |
| | Burundi is participating in the region |
| ibutes | wide project to improve interconnection |
| out | of Electric Grids of Nile Equatorial |
| lic | Lakes Countries. The project consists |
| ion. | of the construction and upgrading of |
| | 769 km of 220kV and 110kV power |

lines and 17 transformer stations to interconnect the electric grids of the Nile Basin Initiative Member countries (NBI), namely Burundi, DR Congo, Egypt, Ethiopia, Kenya, Rwanda, Sudan, Tanzania and Uganda.

Renewable Energy Overview



- Burundi's electricity consumption relies to a great extent on biomass.
- Households are the main consumers of electricity in the country, accounting for 94% of total consumption. Their needs are almost exclusively met by traditional biomass (99%). Electricity (0.3%), and oil products (0.4%) play an insignificant role.
- If industry and transport is included, 94% of all electricity consumption relies on biomass, which is composed by around 70% of fuel wood, 18% of agricultural residues, 6% of charcoal, and 1% of bagasse.

A key feature of the power sector in Burundi is the very low level of electrification; only 2% of the 1.6 million households in the country have electricity.

The average consumption of electricity in Burundi is 23kWh/cap/year, among the lowest levels globally.

Additionally, the viability of an urban waste to energy project in Bujumbura is under evaluation. The project Burundi renewable energy sources owner would, within a public-private include the following: partnership framework, invest in the collection, methanization and production of electricity.

BIOMASS

Burundi possesses a peat potential HYDRO POWER estimated at 600 million tons. The exploitable potential would An equatorial and mountainous country, Burundi benefits from be around 47 to 58 million tons. The management of the peat is the substantial hydropower potential, responsibility of the National Peat coupled with favorable rain conditions and many waterfalls. Office (ONATOUR). Burundi's hydropower potential was evaluated in 1983 to be of 1,700MW

The Moso Sugar Company (SOSUMO) operates a 2 x 2MW cogeneration unit fuelled by bagasse (sugar cane residues) providing electricity to the buildings.

of which approximately 300MW is considered to be economically useful. Over 150 potential hydropower sites have been identified and 29 are SOSUMO factory and its administrative currently in undergoing construction. In total, fewer than 30 sites have been exploited, including eight hydropower plants operated by REGIDESO.

WIND

Despite significant potential, wind power is more or less completely unexploited in Burundi. With only limited production taking place in the Imbo plain region.

SOLAR

Burundi has significant solar potential. The average annual sunshine fraction in Burundi is close to 2,000kWh/m²/year.

A PV plant constructed at the University Hospital of Kamenge in Bujumbura with a capacity of 403kWp is connected to the national grid.

GEOTHERMAL

While there are approximately 15 hot springs in Burundi, currently only two thermal plants are in operation by REGIDESO

WHAT ARE THE MAJOR RENEWABLE **ENERGY GOVERNING LAWS?**

There is no specific law related to renewable energy; they are governed by Law No. 1/13 of April 23, 2015 on the reorganization of the electricity sector in Burundi.



Government Incentive Schemes



The country needs to implement large-scale projects, such as local and regional projects to develop its energy potential.

Mines projects, like MUSONGATI and MUREMERA nickel projects, make that energy demand will require more than 50MW.

With the opening of more of industries after the political crisis, Burundi therefore requires more than 80MW on the existing power capacity.²

² http://fortuneofafrica.com/burundi/energy-sector-profile-in-burundi/

Major Projects/Companies



A PV plant is currently under construction in the Gitega region of the country supported by a 25-year power purchase agreement. Once complete, the 7.5kWc plant will increase generation capacity within the country by around 15%.

Burundi also plans another national project: Jiji/Mulembwe/Siguvyaye in the south of Burundi rated for 100MW or more, and on Ruvubu (Mumwendo site: 80MW).

In addition a series of project are anticipated to reach operational status by 2020, These include plants at Kabu 16 (20MW) and Mpanda (10,4MW) and two regional hydro-electric projects projects: Rusizi III (145MW to be divided with Rwanda and the DRC) and Rusumo Falls (61MW to be divided with Rwanda and Tanzania).



Foreign Investment/Ownership



Foreign investors may benefit from tax and customs exemptions and incentives in the areas of labor legislation, exchange control, entry and residence of foreigners. The country's free zone regime provides additional incentives to foreign investors and owners operating in Burundi.

UNFCCC – PARIS Commitments and beyond



Burundi ratified the Paris Agreement on January 17, 2018. The country's Intended Nationally Determined Contribution contained a commitment to reduce emissions by 20% (relative to a business as usual baseline) by 2030.


Relevant Resources and References



Relevant Websites

Ministry of Hydraulics, Energy and Mines http://www.ministere-energie-mines.gov.bi/

Regie de Production et Distribution d'Eau et d'Electricite (REGIDESO) http://www.regideso.bi/

Burundi Office of Mines and Quarries (OBM) https://www.obm.bi/

Burundi Agency for Rural Electrification (ABER) http://www.aber-burundi.com/

Agency for the Regulation of Water Supply, Electricity and Mines (AREEM) <u>http://www.ministere-energie-mines.gov.bi/-AREEM-.html</u>

Burundi Agency of Hydraulics and Sanitation in Rural Areas (AHAMR) http://www.ministere-energie-mines.gov.bi/-AHAMR-.html

National Peat Office (ONATOUR) <u>http://www.ministere-energie-mines.gov.bi/-ONATOUR-.html</u>

International Society of Great Lakes Countries (SINELAC) http://www.sinelac.org/

Energy of the Great Lakes Countries (EGL) http://www.egl-grandslacs.org/index.php/fr/







Ethiopia

Overview

KEY FACTS

Jurisdiction: Civil jurisdiction with elements of customary law and Constitution of the Federal Democratic Republic of Ethiopia (1994).

Language(s): Amharic is the only language reorganized by the FDRE Constitution as the federal working language.

BUSINESS ENVIRONMENT

2018 Doing Business Report: 161 of 190 (down 2 rankings)

2018 Global Competitiveness Inc 108 of 138 (up 1 ranking)

2017 Index of Economic Freedor of 180 (up 6 rankings)

2016 Corruption Perceptions Ind 108 of 176 (down 5 rankings)

2016 UN Development Programi Human Development Index: 174 of 188 (no movement)

Population: 105 million

GNI per capita: USD1,730

PROFILE

| | Despite being the only African country |
|--------|---|
| | to have largely evaded colonial |
| dex: | rule, landlocked Ethiopia's history |
| | has featured military coups, rebel |
| | coalitions and a border war with |
| m: 142 | Eritrea. Ethiopia became a democratic |
| | republic in 1991, and adopted its |
| dex: | constitution in 1995. With a population |
| | of approximately 105 million, it is the |
| | second most populous country in |
| me | Africa and, despite rapid economic |
| | growth of between 8-11% per |
| | annum, it remains one of the poorest |
| | countries in the world. |

Electricity Industry Overview



Until recently, Ethiopia's electricity market was a state-owned vertically integrated monopoly, Ethiopia Electric Power Corporation that owned and operated all aspects of the electricity system. In 2013, the electricity system was unbundled to some extent, and the mandate of Ethiopia Electric Power Corporation was transferred to two fully state-owned entities. Accordingly, Ethiopian Electric Power (EEP), was established to undertake generation and transmission of electricity and the Ethiopian Electric Utility (EEU) was established to undertake distribution and supply of electricity. One related aspect of the Ethiopian electric system is the unification of distribution and supply of electricity. Based on the different electricity laws, distribution and sale of electricity is granted under a single license.

The enactment of the Energy transmission and/or distribution and Proclamation No. 810/2013 (Energy supply of electricity. Private entities are only permitted to engage in Proclamation) in 2013 introduced generation, off-grid transmission steps towards the liberalization of and distribution of electricity, as the electricity market. Generation of electricity by IPPs alongside EEP and transmission and distribution/ supply through the national grid PPAs to be entered between the IPPs is reserved to the government. and EEP and/or EEU were some of the key changes introduced by the The unification of distribution and Energy Proclamation. The Energy supply licenses, coupled with the Proclamation also introduced legal monopoly granted to the EEU to distribute and supply electricity third-party access rules, where the through the national grid, has transmission and distribution network owners are obliged to give access to further diminished the possibility of other license holders on payment of a introducing competition in the supply prescribed fee. of electricity. Additionally, the tariffs related to both the national grid and Only generation (excluding off-national-grid are determined by transmission, distribution and the government. The ruling party supply) of electricity is liberalized has announced its plan to partially in Ethiopia. The current electricity liberalize different investment areas laws do not create the possibility which were under the government's for competition in the on-grid control. Even though the details of

such liberalization have not yet been disclosed, one of the areas mentioned in the party's statement was the electricity market.

The total installed energy capacity of Ethiopia is recorded to be 4,206MW. Out of this, electricity generated from hydropower plants take the majority share, contributing 89% to the total energy capacity (3,743MW), followed by electricity from wind and thermal contributing 8% and 3% respectively.



Electricity Laws

- Energy Proclamation No. 810/2013 provides for the powers and duties of the Ethiopian Energy Authority (the regulator) and governs the issuance, renewal, transfer and revocation of different kinds of licenses, permits and certificates in relation to the electricity sector. The Proclamation also sets mandatory provisions that regulate the supply of electricity.
- Council of Ministers Energy Regulation No. 447/2019 – provides for detailed provisions on the manner of enforcing the Energy Proclamation as amended.
- Geothermal Resources Development development and use).
- and powers and duties.

Proclamation No. 981/2016 – regulates development activities including generation of electricity from geothermal resources. The Proclamation provides for the rights and obligations of holders of different kinds of license (reconnaissance, exploration,

Ethiopian Energy Authority Establishment Council of Ministers Regulation No. 308/2014 – establishes one of the regulators of the electricity market, Ethiopian Energy Authority and provides for its organizational structure

- Ethiopian Electric Power Establishment Council of Ministers (Amendment) Regulation No. 381/2016 – establishes a fully stateowned utility to undertake generation and transmission of electricity in the national grid.
- Ethiopian Electric Utility Establishment Regulation Council of Ministers (Amendment) Regulation No. 382/2016 – establishes a fully state-owned utility to undertake off-grid generation and transmission of low voltage electricity as well as distribution and supply of electricity in the national grid.
- Investment Proclamation No. 280/2002 The Proclamation provides for the state's exclusive monopoly over transmission and distribution/ supply of electricity through the integrated national grid.
- Investment (Amendment) Proclamation No. 373/2003 – delegates the Ethiopian Energy Agency (predecessor of Ethiopian Energy Authority) to issue, renew and cancel investment permits for transmission and supply of electric energy.



Regulators

There are two main regulators of the electricity market in Ethiopia.

Ministry of Water, Irrigation and Electricity:

The Ministry of Water, Irrigation and Electricity has responsibility for promoting the development of water resources and electricity and promoting the growth and expansion of the country's supply of electric energy. As the supervising authority of EEP and EEU, some of its major powers in relation to both entities include:

- appointing the chairman of the boards;
- causing the allocation of the initial capital of the enterprise;
- determining the increase or decrease of the capital of the enterprise;

- approving the investment plan of the enterprise submitted to it by the board;
- proposing, where necessary, to the Council of Ministers, the dissolution, amalgamation or division of an enterprise under its control, or the transfer of the enterprise or its management in any other manner; and
- approving, in consultation with the board, the annual and long-term corporate targets of the enterprise, and following up their fulfilment.

Ethiopian Energy Authority:

The Ethiopian Energy Authority is accountable to the Ministry of Water, Irrigation and Electricity and is empowered to regulate the electricity market. Some of its major powers include the ability to:

- issue, renew and cancel investment permits for the generation, transmission and supply of electric energy;
- issue and renew licenses for the generation, transmission, distribution and sale, import or export of electricity for commercial purposes;
- issue and renew licenses to undertake energy audits, energy efficiency and conservation contracting or consultancy;
- issue and review certificates of competency;
- supervise the operations of licensees and holders of certificates of competency to ensure compliance with the provisions of the relevant laws and, in the

case of contravention, penalize the licensees or the holder of a certificate of competency with a fine, suspension or revocation of the license or certificate of competency, depending on the gravity of the offence;

- review national grid related tariffs submitted to it by licensees and submit its recommendation to the government for approval; and, upon approval, regulate the implementations thereof and issue and regulate the implementation of guidelines for the determination of off-national-grid tariffs;
- approve electric power purchase and network service agreements;
- hear, investigate and, when necessary, mediate or arbitrate disputes between parties with

complaints over any matter required to be regulated under the Energy Proclamation; and

• collect fees for the issuance and renewal of licenses and certificates of competency and for other services rendered by it.

Generation, Distribution and Transmission

Transmission and distribution/supply of electrical energy through the national grid system is exclusively reserved for the government. However, private actors, including foreign investors, can engage in the generation of electricity and offgrid transmission and distribution. Currently, EEP and FEU are the main actors in the generation, distribution and transmission of power.

So far, off-grid electricity generation and transmission is not widely deployed. However, the government of Ethiopia has recently launched its National Electrification Programme that aims to attain universal access using both on-grid and off-grid systems.





Renewable Energy Overview



Ethiopia generates its electricity mainly from renewables, with generation from geothermal, wind and solar sources being relatively new technologies in the Ethiopian energy sector. Approximately 90% of the installed generation capacity is from hydropower, 8% is from wind sources and 1% is from thermal sources. According to the Second Growth and Transformation Plan 2015/16-2019/20, the priority energy generation sources are hydropower, geothermal, wind energy and solar energy. Biomass and diesel generators are to be used as backup sources.

The government has set the target for increasing the total generation capacity to 17,347MW by 2020, Of this, 13,957MW is expected to be generated by hydropower whereas 1,222MW and 577MW is expected to be generated from wind energy and geothermal respectively. Additionally, the government also plans to generate 300MW from solar.

Photovoltaic power makes up a very small proportion of Ethiopia's installed generation capacity, currently sitting at between 1-2%. ENEL has been selected as the preferred bidder for the construction of the new 100MW Metehara solar plant. This project is valued at USD120 million, power will be sold to the EEP under a 20-HYDROPOWER year PPA, and the operation date The dominant energy source in is scheduled for 2019. Additionally, Ethiopia is hydropower, which the government of Ethiopia with the represents 90% of the installed support of the International Finance generation capacity of Ethiopia. Corporation (IFC) is developing a total It has a number of large hydropower of 500MW solar power under the dams, with significant hydropower Scaling Solar initiative. The RFQ for the investment still being made (i.e. the Scaling Solar round one program was construction of the 1,870MW Gilgel floated by the EEP in October 2017 Gibe III Dam in 2016). for developing two Solar PV projects The Grand Ethiopian Renaissance each with a capacity of 125MW. After

Dam is currently under construction, and when completed will be able to generate 6,450MW and will be one of the largest hydropower dams in Africa and among the largest in the world.

SOLAR

the announcement of 12 prequalified bidders, the RFP was issued in April 2019 calling prequalified bidders to submit their binding proposal to the Director General of the Public Private Partnership (PPP-DG). The second round of Scaling Solar program was issued by PPP-DG in April 2019 calling on interested developers to submit their application before July 9, 2019. PPP-DG has announced that it will be expanding the RFQ to cover up to six projects with a total capacity of up to 750MW.

WIND

Wind represents approximately 8% of the total installed generation capacity. Ethiopia's total wind capacity is 324MW. Significant wind farms include the 120MW Ashegoda wind farm, which when installed in 2013 was Africa's largest wind farm, and the 153MW Adama II wind farm which began operation in 2015.

BIOMASS

According to statistics, there are currently no biomass generation sources within the installed generation capacity, despite the fact that the vast majority of the country's energy consumption is composed of traditional biomass fuels. Under a partnership between the government of Ethiopia and a consortium of international companies (Cambridge Industries Limited, China National Electric Engineering, and Ramboll) the Reppie Project, Africa's first waste-toenergy plant, has begun operation in 2018. It is expected that 185GWh of electricity will be generated from this project.

Current Issues in the Renewables Sector

The Grand Renaissance Dam has been a source of several issues since commencement of the project in 2011. There are concerns about the government's payment of compensation due to lost land caused by the construction of the project. Compensation is owed to approximately 700 farmers, a number of whom maintain that the compensation is inadequate. Additionally, Egypt has concerns that the dam will harm agricultural land and restrict the generational capabilities of Egypt's Aswan dam, due to its huge reservoir capacity. Availability of foreign currency to IPPs to remit their earnings from PPAs and tariff rates that allow full recovery of cost have been raised as the main issues in the overall electricity market.

Renewables Laws

There is no specific renewable energy law in Ethiopia. Renewable energy is governed by the general energy related laws.



Government Incentive Schemes



There are no government incentives specific for renewables. However, foreign investors engaged in the renewable energy sector are entitled to the general incentives available to foreign investors under the investment laws. The investors will also be entitled to open a foreign currency bank account as well us retain some portion of their earnings in a convertible currency.

Major Projects/Companies

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- The Grand Ethiopian Renaissance Dam this project, on completion, is due to be the biggest energy project in Ethiopia (with a generation capacity of 15,000GWh/ year), and the largest dam in Africa, being 1,800m long, 155m high and a reservoir of 74,000 million m³ in volume. There will be two power stations, to be operated by EEP, installed on the dam (6,000MW). As of August 2017 the dam was 60% completed. Once completed, the reservoir is predicted to take between 5 and 15 years to fill.
- **Reppie Project –** the Reppie Project is a waste-to-energy plant built on a landfill site on the outskirts of Ethiopia's capital, Addis Ababa. It began operating in 2018 and the plant was built on the anticipation that it will deal with 1,400 tonnes of waste per day and ultimately account for 30% of the capital's domestic electricity needs.
- Tulu Moye and Corbetti Geothermal Projects – in December 2017, 520MW PPAs and Implementation Agreements were entered into for two geothermal

projects, to be developed by EEP, the government of Ethiopia and one of Tulu Moye/Corbetti Geothermal for each respective project. Each project has a budget of approximately USD2.2 billion. These projects are the result of six years of work begun by Reykjavik Geothermal in 2011. It is hoped that this will be the kick-start of further investment in geothermal and a major step in renewables for Ethiopia.

• Major Energy Companies – the major actors in the electricity market are EEP and EEU. Currently there is no private sector involvement in hydropower generation. However, Ethiopia has recently welcomed major IPPs in geothermal, solar and wind generation. As detailed above, Reykjavik Geothermal has signed a PPA with the EEP for the Corbetti Geothermal Project and Enel Green Power, a subsidiary of Enel, has announced that it has won the Metehara 100MW solar bid.





Foreign Investment/Ownership



Ethiopian investment law classifies investment areas into four categories:

- areas of investment reserved exclusively for government;
- areas of investment reserved exclusively for joint investment with government;
- areas of investment reserved for Ethiopian nationals; and
- areas of investment open to foreign investors.

Investment activities in the first three areas are expressly listed under the Investment Proclamation and Regulation of Ethiopia (Investment Regulation).

The Investment Regulation lists the investment areas which are expressly open for foreign investors. Foreign investors that wish to engage in an investment area not listed in the schedule attached to the Investment Regulation and in areas exclusively reserved to domestic investors are required to apply for a special investment permit from the Investment Board. In passing a decision, the board is expected to take into account whether the investment area under question can be handled by domestic investors alone. As part of their decision, the board may look into the availability or otherwise of local capacity to deliver the service to clients. The Council of Ministers also

nto has the power to issue a Regulation that opens areas exclusively reserved for the government or for joint ventures between the government and private investors to private investors.

> The Ethiopian Energy Authority has been delegated with the power to issue, renew and cancel investment permits for investors that wish to engage in generation, transmission and supply of electrical energy. As the result of such delegation, no application for a special investment permit is required to engage in the generation and off-grid transmission and distribution of electricity.

UNFCCC – Paris Commitments and beyond



Ethiopia ratified the Paris Agreement on January 17, 2017 and in its Intended Nationally Determined Contribution committed the country to reduce its emissions by 64% (relative to a business-as usual baseline) by 2030, In the long-term, Ethiopia intends to achieve its vision of becoming carbon-neutral, with the mid-term goal of attaining middleincome status.

Relevant Resources and References



Relevant Websites

Power Africa Ethiopia Fact Sheet, March 28, 2018 can be accessed at: https://www.usaid.gov/sites/ default/files/documents/1860/ EthlopiaPACFS_3-13-2018_1.pdf









Ghana

Overview

KEY FACTS

Jurisdiction: Common law and the Constitution of the Republic of Ghana 1992.

Language(s): English, African languages including Akan, Hausa, Ga and Ewe.

BUSINESS ENVIRONMENT

2018 Doing Business Report: 120 of 190 (down 12 rankings)

2018 Global Competitiveness Inc 111 of 138 (up 3 rankings)

2018 Index of Economic Freedor 109 of 180 (up 9 rankings)

2018 Corruption Perceptions Inc 78 of 180 (down 8 rankings)

2018 UN Development Program Human Development Index: 140 of 189 (up 1 ranking)

Population: 29.07 million

GNI per capita: USD4,150

PROFILE

| | Formerly known as the Gold |
|------|---------------------------------------|
| | Coast,Ghana became – in 1957 – |
| | the firstAfrican country south of the |
| dex: | Saharato gain independence from |
| | colonial rule. Gold, cocoa and oil |
| | form the bedrocks of a strong and |
| m: | stable economy. Ghana is one of the |
| | most progressive and developed |
| | countries on the continent and |
| dex: | often hailed as a model for African |
| | democracy and growth, but more |
| | recently the economic boom |
| ime | has been challenged by growing |
| | government debt, high rates of |
| | inflation and a weakening currency. |
| | Like many African countries, power |
| | demand outstrips reliable supply. |
| | Electricity also remains expensive |
| | and is therefore a major inhibitor to |
| | socio-economic development. |
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Electricity Industry Overview



- Ghana's electricity market is segmented, with different players having responsibility for the generation, transmission and distribution (see below).
- Installed generation capacity operational and available for grid power supply as at the end of 2018 was approximately 4,562.5MW. In spite of this, actual electricity produced is low for various reasons including the high cost of fuel for operating the country's thermal plants. The country is therefore looking to cheaper sources of electricity especially renewables including solar.
- Ghana imports as well as exports electricity to its neighbors. Its exports of power; however, outstrips imports. In 2018, a total of 384.95GWh and 277.07GWh were exported respectively to Togo/Benin and Burkina Faso. A net of 217.17GWh was also exchanged between Ghana and Côte d'Ivoire. This was made up of 139.69GWh imports and 77.48GWh exports.
- Growth in demand for electricity for both domestic and industrial use, coupled with the rather slow pace of development of its energy infrastructure, has left Ghana consistently playing catch-up to satisfy its electricity needs.

- Electricity supply in 2018 was 16,350GWh, comprising 36.8% hydro, 62.15% thermal, 0.19% renewables and 0.86% imports.
- The National Electrification Scheme of the government of Ghana has a policy objective of achieving universal access to electricity by all Ghanaians by 2020. As of 2018, 85% of the Ghanaian population had access to electricity.
- In 2016, the government of Ghana established ESLA PLC, a public limited liability company charged with responsibility for issuing long-term bonds to pay the country's energy sector debts

- due to banks and trade creditors. The securities issued by ESLA are backed by receivables emanating from the Energy Sector Levy which is imposed under the Energy Sector Levies Act, 2015 (Act 899).
- There are currently four renewable energy plants feeding into the national grid. A 2.5MW solar plant developed by the state owned Volta River Authority and two 20MW solar plants developed by independent power producers. There is also a 100kW biogas electricity generation plant developed by Safi Sana Ghana Limited, an IPP.
- In recent years, and with the increasing development of the renewable sector, proposals for off-grid solutions where producers aim to generate electricity for specific individual entities are on the rise.

Electricity Laws

- Energy Commission Act, 1997 (Act 541)
 Act 541 establishes the legal framework for the regulation, management, development and utilization of energy sources in Ghana.
 It establishes the Energy Commission which is the licensing body of the energy sector in Ghana (see below).
- Public Utilities and Regulatory Commission Act, 1997 (Act 538)

Act 538 establishes the Public Utilities Regulatory Commission (see below).

Renewable Energy Act, 2011 (Act 832)
 The Renewable Energy Act is a relatively

 new law in Ghana which sets out the legal
 framework for the production and sale of
 energy from renewable sources in Ghana.
 It also provides incentives for producers of
 energy from renewable sources (see below).



Regulators

There are two main energy regulators in Ghana:

• The Energy Commission is the licensing authority of the energy sector. It serves as the government's energy policy advisor by making national energy policy recommendations and is "committed to developing and elaborating national policies and strategies for all renewable resources such as biomass, solar, geothermal, water and wind." The Energy Commission is tasked with, among other things, the responsibility to consult with the Public Utilities Regulatory Commission and recommend financial incentives necessary for the development, production and utilization of renewable energy sources. It is also mandated to recommend exemption from

customs, levies and other duties, equipment and machinery necessary for the development, production and utilization of renewable energy sources.

• The Public Utility Regulatory Commission (PURC) regulates the provision of utility services in the electricity and water sectors. It is mandated to, among other things, provide guidelines on rates for provision of utility services, examine and approve rates for provision of utility services, and monitor compliance with performance standards of service providers in the energy sector.

Generation, **Distribution** Transmission is carried out by and Transmission

In the mid-1990s, Ghana embarked on a reform of its energy sector. This led to the separation of the generation and transmission functions of the Volta River Authority and the conversion of the stateowned power distributor, Electricity Corporation of Ghana, into a private company limited by shares -Electricity Company of Ghana (ECG).

The reform led to the participation of IPPs in the electricity sector, especially in the area of generation. However, the Volta River Authority remains the major generator of electricity. The Volta River Authority is solely owned by the government of Limited (PDS) in February 2019. PDS Ghana.

the Ghana Grid Company Limited (GRIDco). GRIDco owns and operates the transmission grid mainly at 161KV with a total length of about 5,100 km.

There are three distribution companies in Ghana. The ECG is the main distributor of electricity (with over 70% market share) alongside Northern Electricity Distribution Company and Enclave Power Company. Pursuant to agreement between the government of Ghana and a consortium of investors, the distribution functions of the ECG were taken over by a new company, Power Distribution Services Ghana is now required for the next 20 years to distribute electricity to all the areas previously under the control of the ECG.

Renewable Energy Overview



The renewable energy sector as a contributor to the energy mix in Ghana has a relatively recent history. With the passage of the Renewable Energy Act, 2011 (Act 832) every two years." the country has seen significant growth in the area of **HYDROPOWER** renewables with over 100 companies registering to provide Hydroelectric power remains the most dominant form of renewable renewable energy solutions to the country's energy needs. energy in Ghana. There are currently However, only four renewable energy projects have been three hydro-electric dams, all on the Volta River and all state-owned, connected to the national grid (a 2.5MW solar facility, with a combined installed capacity two 20MW solar facilities and a 100kW biogas electricity of 1,580MW contributing to about 36.80% of the country's total power generation plant). The contribution of renewables to supply in 2018: (a) the Akosombo dam; Ghana's total energy mix is currently estimated at 0.19%. (b) Kpong hydro-electric dam; and (c) the Bui dam. With the country's policy of having renewables contribute to 10% of its energy mix, there is much opportunity for private **SOLAR** In recent years and with the passage investors in the renewables space to contribute to achieving of the Renewable Energy Act, 2011 this target. The Renewable Energy Act requires an electricity (Act 832), private sector involvement in solar has seen a significant increase. distribution utility or bulk customer to procure a percentage of its total electricity purchase as specified by the PURC Solar resource is abundant in Ghana. The monthly average solar irradiation from renewable energy sources and provides in terms of is between 4.4 and 5.6kWh/m²/ incentives, that a "...feed-in-tariff rate fixed for electricity day (16-20K/m/day), with sunshine

from renewable energy sources shall be guaranteed for period of ten years and subsequently be subject to review

duration of between 1,800 and 3,000 hours per annum.

WIND

There are a number of proposals to develop wind farms in Ghana the most well-known of them is the proposed 225MW wind farm at Ayitepa, for which all requisite licensing, we understand, has been obtained.

BIOMASS

Research has shown that Ghana has great potential for producing energy biomass although no identifiable project has been put on stream. A 2014 proposal by a Norwegian company to build a 600MW plant is yet to take off.

Current Issues in the **Renewables Industry**

The major issues confronting the renewables industry in Ghana is the upfront cost involved in producing energy from renewable energy sources and the ability to recover such costs within a reasonable timeframe. In the past, the government of Ghana guaranteed payments from the stateowned distribution utility (ECG), which was the major off-taker for electricity produced in Ghana. There has recently tariffs agreed with these independent been a shift away from providing such guarantees and investors have had to find other ways of securing the payment obligations of the electricity distribution company. An additional issue is the drive to renegotiate the

tariffs agreed with power producers, including those from renewable sources. At the height of the energy crisis in Ghana, numerous PPAs were entered into between the government and various power producers. Most of these are yet to come on stream. With the relatively stable power situation in the country, there is a new drive to renegotiate downwards the feed-in power producers, the result being a decrease in their potential profit margins and an increased period over which initial cost of their investments may be recovered.



Government Incentive Schemes



The Renewable Energy Act, 2011 (Act 832) provides for a feed-in tariff scheme with three components:

- Renewable purchase obligation: Every electricity distribution utility or bulk consumer of electricity is required to purchase a percentage of its total electricity purchase from renewable sources.
- Guaranteed feed-in tariff rates: The feed-in tariffs fixed for electricity from renewable sources are guaranteed for a period of ten years and subject to review every two years thereafter.

• An operator of a transmission or distribution system is required to, at the request of a renewable energy generator, connect such generator to the transmission or distribution system within its coverage area.

Major Projects/Companies

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- The Volta River Authority is the operator of the Akosombo and Kpong dams. Built in the 1960s, the Akosombo dam remains the single largest producer of electricity in Ghana with an installed capacity of just over 1,000MW. Bui Power Authority has also developed a 400MW hydro dam at Bui in the Brong-Ahafo Region of Ghana. With government policy to build dams across the three northern regions of Ghana, there is potential for private sector participation in the development of small dams across those regions.
- In July 2016, BXC Ghana Limited connected to the grid its 20MW solar power plant in the Central Region of Ghana.

- On September 15, 2018, a further 20MW solar plant constructed by Meinergy Ghana Limited was commissioned at Gomoa Onyadze in the Central Region of Ghana.
- Volta River Authority developed a 2.5MW solar power project in Navrongo in the Upper East Region. The plant has been operational since May 2013.
- A 225MW wind farm project is being developed in the Ningo-Prampram District by Upwind Ayitepa Limited.
- Ghana-based solar power project developer Home Energy Africa is developing a 100MW proposed solar power project in the Upper West Region of Ghana.











Foreign Investment/Ownership



Foreign investment in Ghana received a significant boost with the passage of the Ghana Investment Promotion Centre Act, 2013 (GIPC Act). The GIPC Act established the Ghana Investment Promotion Centre (GIPC) which is responsible for encouraging and promoting investments in Ghana and creating an attractive incentive framework.

Incentives for registering with the GIPC include:

• unconditional transferability through any authorized dealer bank in freely convertible currency of: (i) dividends or net profits attributable to the investment; (ii) payments in respect of loan servicing where a foreign loan has been obtained; (iii) fees and charges in respect of any

exemptions from import duties, sales tax or excise duties on plants, machinery, equipment or parts thereof required for the enterprise. The GIPC Act set minimum capital requirements for foreigners who wish to invest in Ghana. The minimum capital requirement may be met in cash or capital goods relevant to the technology transfer agreement investment. A foreigner in a joint registered under the GIPC; and (iv) venture with a Ghanaian is required to the remittance of proceeds (net satisfy a minimum capital requirement of all taxes and other obligations) of USD200,000 and the Ghanaian in the event of sale or liquidation partner is required to hold at least of the enterprise or any interest 10% of the equity of the joint venture. attributable to the investment; In the case of solely owned foreign enterprise, the foreigner is required to • guarantees against expropriation; invest at least USD500,000.

- automatic expatriate quotas; and

UNFCCC – Paris Commitments and beyond



Ghana ratified the Paris Agreement on September 21, 2016 and in its Intended Nationally Determined Contribution committed the country to reduce its emissions by 15% (relative to a business as – usual baseline) by 2030, Ghana also set a conditional reduction target of up to 45% reduction in emissions by 2030, subject to availability of international support for finance, technology transfer and capacity building.

Relevant Resources and References



Relevant Websites

Energy Commission – <u>http://</u> www.energycom.gov.gh/ promotingrenewable-energy

Energy Commission – Ghana Wholesale Electricity Market Bulletin, Issue No. 38 – <u>http://www.energycom.</u> gov.gh/emop/ghana-wholesaleelectricity-market-watch-monthlybulletin/category/17-2019-monthly bulletin

https://www.transparency.org/cpi2018

https://www.heritage.org/index/ <u>country/ghana</u>

http://hdr.undp.org/en/2018-update

2019 Electricity Supply Plan for the Ghana Power System – <u>http://www.</u> gridcogh.com/media/photos/forms/ supplyplan/2018_Electricity_Supply_ <u>Plan.pdf</u>

Public Utilities Regulatory Commission – http://www.purc.com.gh/purc/

Electricity Company of Ghana http://www.ecgonline.info/

International Trade Administration https://www.export.gov/ article?id=Ghana-Energy

Ghana Investment Promotion Centre http://www.gipcghana.com/





Kenya

Overview

KEY FACTS

Jurisdiction: The Constitution of Kenya 2010 and common law.

Language(s): English and Swahili.

BUSINESS ENVIRONMENT

2019 Doing Business Report: 61 of 190 (up 19 rankings)

2018 Global Competitiveness Index: 91 of 138 (up 5 rankings)

2019 Index of Economic Freedom: 130 of 180 (up 5 rankings)

2018 Corruption Perceptions Index: 144 of 176 (up 1 ranking)

2017 UN Development Programme Human Development Index: 142 of 189 (up 4 rankings)

Population: 49.7 million

GNI per capita: USD3,250

PROFILE

This East African country on the Indian which seeks to enhance investment Ocean is well-known for its savannah and wildlife. As the founding member of the East African Community, it is a major player in East Africa. With the deep-water port of Mombasa and borders with Somalia, Ethiopia, South Sudan, Uganda and Tanzania, it is a significant communications and logistics hub for the region. Kenya's economic development blueprint, Vision 2030, aims to create "a globally competitive and prosperous country with a high quality of life by 2030." Vision 2030 is supplemented by the

Kenya government's Big Four Agenda, in manufacturing, provide affordable housing, enhance food and nutrition security and achieve 100% universal health coverage by 2022.

Electricity Industry Overview



The Kenyan energy market is liberalized with different state entities having responsibility for the generation, transmission and distribution of power. Previously, the electricity supply industry structure was that of a single buyer model with all generators, including independent power producers (IPPs), selling power in bulk to Kenya Power and Lighting Company Limited (KPLC) for dispatch and onward distribution to consumers. However, with the enactment of the Energy Act, 2019, KPLC's monopoly is set to be broken as electricity distribution and retail supply may be carried out by other players, so long as they are licensed by the Energy and Petroleum Regulatory Authority (EPRA). This move is expected to result in an increase in competition in the distribution and retail supply of electricity and improve the quality of service in the power sector.

The interconnected system in Kenya had a total effective capacity of 2,278MW as at 2018. This comprised 47% geothermal, 30.1% hydro and 20.6% thermal. In terms of demand, electricity demand options, mini-grids and stand-alone community facilities and enterprises grew by 8.8% in 2018 from 1,656MW solar systems that complement grid in the furthest corners of Kenya which the previous year to 1,802MW while the extension and intensification) as means lack grid networks and the Last Mile installed generation capacity increased through which to electrify households Connectivity Project (LMCP), which by 0.76% from 2,259MW to 2,351MW. and businesses throughout the country. involves extension of the low voltage The additional capacity includes 10MW network to reach households located The decision as to how best to electrify of geothermal generation from OrPower each region is determined with the help within 600 m of a transformer. of geospatial technology, which provides 4 Inc., 2.5MW from Chania and Gura hydro power plants developed by the an overview of population density in Alongside the KNES launch, the Kenya Tea Development Authority (KTDA) relation to the existing grid – thereby government also launched the Electricity and 0.25MW of solar generation from identifying areas in which off-grid Sector Investment Prospectus which Strathmore University – the first solar solutions would be the best option. outlines the investment opportunities in plant to be connected to the national the energy sector over the next five years grid under the Feed-in Tariffs (FiT) policy. The strategy further highlights the crucial valued at approximately USD14.8 billion. role that the private sector will play in The prospectus highlights opportunities According to the government, total providing off-grid solutions for Kenyan in power generation, transmission, access to electricity in the country homes, businesses and community distribution, off-grid electrification, mini-grids and solar systems for homes now stands at 75%. However, the service centers in remote parts of government is looking to expand and institutions and aims to help the country. investors and financiers identify suitable universal access to all parts of Kenya investment opportunities.

in an economically viable manner. KNES will be implemented alongside In this regard, the government in other electrification programmes such as the Kenya Electricity Modernization partnership with the World Bank, Project (KEMP) which is aimed at launched the Kenya National Electrification Strategy (KNES) in increasing access to electricity and strengthening KPLC, the Kenya Off-grid December 2018, which provides a roadmap for universal access by Solar Access Project (KOSAP), which is 2022. The strategy has identified designed to scale-up electrification in least-cost options (such as off-grid households, market centers, schools,

With respect to off-grid energy, there are currently 21 mini-grid stations, 19 of which are owned by the Rural Electrification and Renewable Energy Corporation (REREC) and managed by KPLC. The other two are owned and managed by the Kenya Electricity Generating Company (KenGen). While most of the mini-grid stations are dieselfired generators, hybriding of four diesel power stations with solar has been undertaken to improve on the affordability of power.

In addition and given the high maintenance costs of diesel generating stations, REREC has shifted to renewable energy generation in the off-grid areas and is implementing 26 solar mini-grid projects in the off-grid Counties of Wajir, Turkana, Marsabit, Mandera and Garissa.

Several private companies are also operating in the off-grid energy sector in Kenya, including Powerhive and Vulcan, which sell small-scale power directly to consumers through mini-grids. There are also private players in solar lanterns and single-home solar systems.

As at 2018, the total installed off grid capacity was 31.6MW, consisting of thermal (30.4MW), solar (0.69MW) and wind (0.55MW).



Electricity Laws

- The Constitution of Kenya, 2010, provides that:
 - the national government shall be responsible for energy policy including electricity and gas reticulation and energy regulation; and
 - county governments shall be responsible for county planning and development including electricity and gas reticulation and energy regulation.
- Sessional Paper No. 4 of 2004 laid the policy framework upon which cost-effective, affordable and adequate quality energy services will be made available to the domestic economy on a sustainable basis during the period 2004-2023.
- The Feed-in-Tariff (**FiT**) Policy, 2012 aims at promoting generation of grid connected electricity from renewable energy sources

- Act, 2019.
- enabling environment for the government's Big Four Agenda.

(wind power, biomass, small hydro, solar, biogas and geothermal) and prescribes the contents of a standardised power purchase Agreement (**PPA**). This Policy has been incorporated into the newly enacted Energy

The Energy Act, 2019 – which came into force on March 28, 2019. The Act seeks to consolidate the laws relating to energy; promote renewable energy; promote exploration, recovery and commercial utilization of geothermal energy; regulate midstream and downstream petroleum and coal activities; and regulate the production, supply and use of electricity, among others. The legislation is expected to create an





Regulators

- Ministry of Energy (MoE) responsible for energy policy formulation through which it provides an enabling environment for all stakeholders.
- Energy and Petroleum Regulatory Authority (EPRA) – established under the Energy Act, 2019 as successor to the Energy Regulatory Commission, as the energy sector regulatory agency responsible for economic and technical regulation of electric power, renewable energy, coal and petroleum sub-sectors. Its functions also include tariff setting, review, licensing, enforcement and approval of power purchase and network service contracts. It oversees pricing and plays a role in negotiation of PPAs between Kenya Power and Lighting Company Limited (KPLC) and the power producers.
- Energy and Petroleum Tribunal (EPT) – has the responsibility of hearing and determining disputes and appeals relating to the energy and petroleum sector arising from the Energy Act, 2019 and any other statute. The EPT replaces the Energy Tribunal that existed under the repealed Energy Act.
- Rural Electrification and Renewable Energy Corporation (REREC) established under the Energy Act 2019. In addition to overseeing the implementation of the Rural Electrification Program, REREC's extended mandate under the Energy Act, 2019 includes developing and updating the renewable energy master plan; establishing energy centers in the Counties; developing, promoting and managing use of renewable energy (excluding geothermal); energy; developing appropriate local capacity for renewable technologies; and offering clean

energy development mechanisms such as carbon credit trading, among others.

Nuclear Power and Energy Agency (NPEA) – established under the Energy Act, 2019. NPEA's principal objectives include promoting the development of nuclear electricity in Kenya and carrying out research, development and dissemination activities in the energy and nuclear power sector. NPEA takes over from the Kenya Nuclear Electricity Board that existed under the repealed Kenya Nuclear Electricity Board Order.

Generation, distribution and transmission

The Kenya Electricity Generating Company Limited (KenGen) is the leading electric power generation company, producing about 75% coordinating research in renewable of electricity capacity installed in the country. Independent Power Producers (IPPs) account for about

In order to enhance exploitation of the vast geothermal resources in Kenya, in 2008, the government set up a fully government-owned special purpose vehicle – the Geothermal Development Company (GDC), to manage the geothermal exploration risk and attract investors. The GDC is tasked with developing steam fields and selling geothermal steam for electricity generation to KenGen and to private investors.

The Kenya Electricity Transmission Company Limited (KETRACO), which is government-owned, is responsible for the development, maintenance and operation of the national transmission grid network. It is also responsible for facilitating regional power trade through its transmission network.

All generators sell power in bulk to KPLC, for dispatch and onward transmission and distribution to consumers. KPLC is currently the distribution licensee in most parts of 24% of the country's installed capacity. Kenya. However, this is set to change

following the enactment of the Energy Act 2019, which allows for electricity distribution by other players licensed by EPRA.

REREC carries out grid extension at medium and low voltage in areas which are considered uneconomic for electrification by KPLC.

County governments have the function of preparing county energy plans (incorporating petroleum, renewable energy and electricity master plans), county energy regulation (including regulation and licensing of retail petroleum service stations), county gas reticulation systems as well as implementation of county electrification projects. Consequently, counties work in collaboration with REREC and KPLC to enhance connectivity in the country.













Renewable Energy Overview



In Africa, Kenya leads in exploiting renewable energy hydropower generation and mitigating increase in electricity costs by sources to provide energy required to complement the minimizing dispatch of expensive realization of Vision 2030, The renewable energy subthermal power. sector in Kenya significantly contributes to the overall At present, the country has 653MW energy mix in Kenya. By way of example, renewable installed capacity and a geothermal development plan is being energy, mainly from hydro and geothermal sources, implemented by the GDC. Detailed accounted for 70% of total of the total energy purchased surface studies of some of the geothermal prospects in the country in 2018 with geothermal contributing 47% and hydro have been undertaken. Evaluation of 30.1% of that energy. This is expected to increase with this data sets suggest that 5,000MW to 10,000MW can be generated from the commissioning of the 165MW Olkaria V power plant the high temperature resource areas in June 2019. in Kenya.

The Renewable Energy Department under the Ministry of Energy is responsible for leading the development and regulation of the renewable energy and energy efficiency through research and planning, development of standards and regulations, compliance and enforcement.

GEOTHERMAL

KenGen has been at the forefront of driving the country's green energy agenda mainly from geothermal resources. Currently, 80% of KenGen's energy portfolio is geothermal and hydro. In 2018, contribution from to 47% of the total energy purchased by KPLC easing overreliance on

HYDROPOWER

Although hydropower contributes in bulk to energy production in Kenya, the risk of unreliability during periods of drought has pushed the government to favor solar, wind, thermal and geothermal generation geothermal resources increased by 4% in its current plans for the energy sector. Kenya has an estimated hydropower potential of about

6,000MW comprising large hydros (sites with capacity of more than 10MW) and small hydros. Currently over 820MW is exploited, mainly in large installations owned by the national power generation utility, KenGen. Potential for small hydros is over 3,000MW, of which about 25MW has been developed.

SOLAR

Kenya has great potential for the use of solar energy throughout the year because of its strategic location near the equator with 4-6kWh/m²/day levels of insolation. Solar utilization is mainly for photovoltaic (PV) systems, drying and water heating.

In 2017, there was a significant surge in the use of solar energy following the coming into force of the Energy (Solar Water Heating) Regulations, 2012 which required all buildings with hot water requirements exceeding 100 liters per day to install solar heating systems. The Energy

(Energy Management) Regulations, 2012 also require all designated facilities (industrial, commercial and institutional users of energy consuming more than 180,001kWh per year) to conduct energy audits. Such designated facilities are required to commence implementation of energy saving measures identified by such audits and accomplish at least 50% savings within a period of three years.

Various companies are operating in the off-grid solar energy sector, including players in solar lanterns, single-home solar systems, and renewable energy mini-grids. By way of example, the pay-as-yougo model, popularized by M-Kopa Solar, has taken off in Kenya's solar energy sector, enabling low-income households, in off-grid locations, to rent, and later own, home solar power systems.



The government also initiated the Kenya Off-grid Solar Access Project (KOSAP) for electrification of institutions far from grid using solar PV systems. By the year 2020, it is projected that the installed capacity of solar photovoltaic systems will reach 100MW generating 220GWh annually.

WIND

The Lake Turkana Wind Power Project (LTWP) and the Ngong Hills Wind Power Project are the only wind farms that are connected to the national grid, with capacities of 310MW and 25.5MW respectively. The LTWP is the largest wind power plant in Africa having achieved full commercial operation in March 2019. Wind energy development in Kenya is expected to increase from private investments, facilitated by the FiT Policy and the Least Cost Power Development Plan.

Kenya has vast unexploited wind promoted agro forestry and social resources and high wind potential forestry programmes to increase the making it suitable for potential stock of woody biomass on farms to make up for the loss of forest investors. A good example of the wind potential in Kenya is the LTWP, which trees as forestland is converted into has recorded an average of above agricultural and settlement land. 80% capacity factors.

The government of Kenya has In Kenya, cogeneration using bagasse estimated that 2GW of wind capacity as a primary fuel is common practice will be installed in Kenya by 2030. in the domestic sugar industry. The industry comprising of six sugar BIOMASS companies produces an average Biomass fuels are the largest source 1.8 million tonnes of bagasse with of primary energy in Kenya with fiber contents of about 18% by weight wood-fuel (firewood and charcoal) annually. A good example is Mumias accounting for about 68% of the total Sugar Company, which currently primary energy consumption. About exports approximately 21.5MW of 55% of this is derived from farmlands power to the national grid. in the form of woody biomass as well

as crop residue and animal waste and the remaining 45% is derived from forests. The government has

COGENERATION

BIOGAS

Biogas potential in Kenya has been identified in municipal waste, sisal and coffee production. The total installed electric capacity potential of all sources ranges from 29-131MW, generating 202 to 1,045GWh, which is about 1.3% to 5.9% of the total electricity purchased in the system.

Current issues in the renewables industry

In 2016, a taskforce was constituted to review Power Purchase Agreements (PPAs) negotiated between the Independent Power Producers (IPPs) and government on grounds of economic changes. The taskforce was to recommend appropriate policy action that will enable the government achieve value for money on all PPAs signed to date.

Among the key recommendations of the task force was the reduction of tariffs under the FiT Policy. This was based on the assumption that the cost of equipment for FiT projects had reduced and the knock on effect of such reduction should be a reduction in the tariff per unit of electricity.

Further, the taskforce recommended the introduction of a renewable energy auction system where the government will, when need arises, purchase electricity from the lowest bidder. This is expected to lead to a reduction of electricity costs in the country and to enable the regulators manage the capacity supply and demand in Kenya as envisaged in the Least Cost Power Development Plan.







Additionally, whereas Kenya is keen to facilitate energy supply through mini-grids and other off-grid solutions through the private sector, there is currently no clear policy framework to guide the development of minigrids and investors lack clarity as to whether mini-grids will eventually be connected to the national grid once the same arrives at a mini-grid and the and technologies that have not applicable tariff.

Access to financing for the service providers also remains a challen especially due to inconsistent application of PPA negotiation process, and difficulties in secur land, among others.

According to MoEP, there are als currently renewable energy sour yet been widely demonstrated o commercialized. These include ocean energy, biomass gasificati bio-refinery technologies and concentrating solar power. Of particular interest is ocean energy,

| се | owing to the long coastline which |
|-------|--------------------------------------|
| nge | Kenya enjoys. The most developed |
| | conversion systems use tidal energy, |
| | thermal energy, marine currents and |
| ing | ocean waves. A private investor has |
| | expressed interest in developing |
| | a 100MW electric tidal wave |
| 50 | power plant. |
| rces | |
| | |
| or | |
| | |
| tion, | |
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Government Incentive Schemes



In order to attract foreign direct investments in the renewable energy sector, the government has undertaken the following initiatives:

- development of the FiT Policy to promote the generation of electricity from renewable energy sources which has been revised twice (2010 and 2012) and more recently codified into the Energy Act, 2019;
- development of a renewable energy portal (<u>http://www.</u> renewableenergy.go.ke/) which offers a "one stop shop" guide to renewable energy projects;
- zero-rating the import duty and removal of Value Added Tax on renewable energy equipment and accessories;

- exemption from tax on interest paid on loans from foreign sources for investing in the energy or water sectors;
- exemption from payment of stamp duty in respect of instruments executed in respect of transactions relating to loans from foreign sources received by investors in the energy sector; and
- exemption from withholding tax payments made to a nonresident for services rendered under a PPA including the design, construction, installation, testing, commissioning, operating and maintenance of a power plant.



Major Projects/Companies



 Lake Turkana Wind Power **Project (LTWP)** – LTWP has been generating and supplying electricity in to the Kenyan national grid since September 2018, when construction of the 436 km Loiyangalani – Suswa transmission line was completed by KETRACO. The various components that make up the Project have all been completed and include 365 wind turbines, (each with a capacity of 850kW) and a high voltage substation connected to the Kenyan national grid through the transmission line constructed by the Kenyan government. The wind farm provides 310MW of energy to Kenya's national grid and the power will be bought at a fixed price by KPLC over a 20-year period in accordance with the PPA. The project was developed by the LTWP consortium comprising KP&P Africa B.V and Aldwych International as co-developers, Investment Fund for Developing Countries, Vestas Eastern Africa Limited, Finnish Fund

for Industrial Cooperation Ltd, KLP Norfund Investments AS and Sandpiper.

- Menengai Geothermal Project an estimated 1,600MW project. GDC has realized 160MW of steam at the well head. GDC has contracted three IPPs to construct three power plants under Phase I (commenced 2011). Ground breaking for power plant construction took place in February 2017 and completion is expected within 18 months.
- Kipeto Wind Energy has a generation capacity of 100MW. The project is the second largest wind power project in Kenya. Developed by Kipeto Energy Limited Company (SPV) with the principal players being Overseas Private Investment Corporation, Craftskills Wind Energy International Limited, International Finance Corporation and ACTIS.

Meru 400MW Wind Power

- **Project** KenGen is set to develop a 400MW wind power farm. Construction of the first phase of the project was set to begin in 2019 but has been delayed due to challenges in acquiring land for the project. The German Development Bank and the French Development Agency have jointly committed EUR120 million (KES13.4 billion) towards the first phase of the power project.
- Garissa Solar Power Plant

- developed by the Rural Electrification and Renewable Energy Corporation (REREC) and managed by KENGEN, this Project sits on 85 hectares of land and has 200 solar panels with an installed capacity of 50MW. This Project is the largest grid connected solar power plant in East and Central Africa and currently contributes about 2% of the national energy mix.

- IPPs Solar Power Projects ERC has signed various PPAs with investors proposing 40MW projects to be developed under the FiT Policy including Alten Energy Solarfarms, Radiant Energy, Eldosol Energy Limited and Kenya Solar Energy Limited.
- Olkaria Project owned and managed by KenGen. GDC's 59 geothermal wells in Olkaria have a total yield of 412MW. GDC is selling 320MW of steam to KenGen for electricity generation, generating annual revenue of KES3 billion. By providing steam for electricity generation, GDC has helped displace diesel power plants which generate expensive and environmentally unfriendly power.
- Baringo-Silali Block Geothermal **Project** – has an estimated potential of 3,000MW. The government of Kenya is funding the construction of access roads and community engagement

initiatives while KfW has given GDC a concessional loan of EUR80 million for the drilling of 15-20 geothermal wells, undertaking several consultancies and installing a water pipeline to supply water for drilling.

- Suswa Geothermal Project has an estimated potential of 750MW which will be developed in phases, with the first three phases totalling 300MW.
- Akiira Geothermal Project Akiira Geothermal project is a 140MW geothermal power project utilising the steam resources in the Kenyan Rift Valley. The project will be connected to the Kenyan national grid. The project is in early construction/exploration drilling phase. D1 Frontier Market Energy and Carbon Fund is the substantial shareholder in the SPV, Akiira Geothermal Ltd.







Foreign Investment/Ownership



Currently, there are no foreign investment restrictions that apply to the power sector. Foreign investors in the power sector in Kenya receive the same treatment as local investors and are subject to similar requirements as local investors. To encourage investment in Kenya, in 2004, Parliament enacted the Investment Promotion Act, 2004 which aims to reduce delays in relation to licensing, immigration and negation of tax incentives and exemptions with the relevant authorities. Under that Act, a state entity known as the Kenya Investments Authority was established with the main objective of promoting investments in Kenya. A foreign investor may apply for an Investment Certificate from the Kenya Investment Authority if, among other things, the amount to be invested by a foreign investor is at least USD100,000 or the equivalent in any currency.

An Investment Certificate entitles a There are currently no foreign foreign investor to various benefits; exchange controls in Kenya and the key benefit being entitlement to foreign currency is freely repatriable. various operating licenses, depending Non-citizens may only hold land on on the sector in which the holder the basis of leasehold tenure and operates. The holder of an Investment Certificate is also entitled to entry such leases may not exceed a period permits for three members of the of 99 years. Non-citizens also cannot holder's management or technical acquire agricultural land. staff and three entry permits for the In terms of local content owners, shareholders or partners.

requirements, the Energy Act 2019 The following reforms have also been requires parties involved in the energy made to encourage economic growth: sector to prepare annual and long establishment of one-stop shops for term local content plans which should multiple government services – known give first consideration to goods as Huduma Centers; streamlining manufactured in Kenya and services of business startup requirements; provided within the relevant county as well as qualified and skilled Kenyans and, increased transparency in property registration including online with respect to employment at all processing of land transactions. levels of the value chain. Such plans should also ensure that adequate provision is made for on the job training for Kenyans.

The above local content requirements are enhanced by the requirements in the construction sector which stipulate that foreign contractors undertaking construction works in Kenya must either enter into a joint venture with local contractors or locally subcontract not less than 30% of the value of the contract work (for which registration is sought) and transfer technical skills not available locally to a local person or firm.

To encourage listing of companies, with effect from January 1, 2016, the corporate tax rate for newly listed companies was reduced from the normal 30% rate to a 25% rate for a period of five years commencing from the financial year of listing.



UNFCCC – Paris Commitments and beyond



Kenya ratified the Paris Agreement on December 28, 2016, and in its Intended Nationally Determined Contribution (INDC) seeks to abate its GHG emissions by 30% by 2030 relative to the BAU scenario of 143 MtCO₂ and in line with its sustainable development agenda. This is also subject to international support in the form of finance, investment, technology development and transfer, and capacity building.

Relevant Resources and References



Relevant Websites

Ministry of Energy and Petroleum – <u>http://energy.go.ke/</u>

Energy and Petroleum Regulatory Authority – <u>https://www.erc.go.ke/</u>

Kenya Electricity Generating Company Limited – www.kengen.co.ke/

Kenya Electricity Transmission Company Limited – https://www.ketraco.co.ke/

Renewable Energy Portal – <u>http://www.renewableenergy.go.ke/</u>

Kenya Power and Lighting Company – <u>http://www.kplc.co.ke/</u>

Rural Electrification and Renewable Energy Corporation – <u>www.rea.co.ke/</u>

Kenya Law – <u>http://www.kenyalaw.org/</u>







07 Mauritius

Renewable Energy in Africa

Mauritius – Overview



Mauritius

Overview

KEY FACTS

Jurisdiction: French-based civil legal system with elements of English-based 20 of 190 (up 4 rankings) common law.

Language(s): English (Official Language), Mauritian Creole, Bhojpuri, and French.

BUSINESS ENVIRONMENT

2019 Doing Business Report:

2018 Global Competitiveness In 45 of 138 (no movement)

2019 Index of Economic Freedor 25 of 180 (down 5 rankings)

2018 Corruption Perceptions Inc 51 of 176 (down 1 ranking)

2018 UN Development Program Human Development Index: 65 of 188 (down 1 ranking)

Population: 1.3 million

GNI per capita (2017) : USD22,570

PROFILE

| | Mauritius is located off the southeast |
|-------|--|
| | coast of Africa, and is an island state |
| | of 1.3 million inhabitants spanning |
| idex: | 1,865 km ² . Since its independence |
| | in 1968, Mauritius has benefitted |
| | from stable political and economic |
| m: | conditions. However, environmental |
| | circumstances place the country at |
| | significant risk to climate change, |
| dex: | and in particular rising sea levels. |
| | The country's current account deficit |
| | is expected to remain smaller than |
| nme | in recent years, as is consistent with |
| | some persistent slack in Mauritius' |
| | economy, coupled with strong tourism |
| | earnings and favorable global energy |
| | prices. |
Electricity Industry Overview



The Central Electricity Board (CEB) is the sole agency for transmission, distribution, and sale of electricity in Mauritius.

There has been a steady growth in demand for electricity, driven by economic development, supported by substantial ongoing investments in electrification. Access to electricity in 2016 stood at 91.89% within the urban population and 98.78% nationwide. In 2019 Mauritius' electricity production stood at 2.9 billion kWh, with its consumption at 2.7 billion kWh. The electricity market in Mauritius has, since then, evolved into a more dynamic operating environment, due to an accelerated growth in demand post the 1990s. The rapid growth was, most likely, the effect of structural changes in the domestic economy.

Mauritius moved away from a mono-crop-based economy towards diversification. Industrialization, which followed, was accompanied by heavy investments in exportoriented sectors, especially in the textile and manufacturing industries. These industries, by their operational nature, are more electricity intensive. Demand for the purchase of electricity is mainly, therefore, the result of a re-engineering of the economy, accompanied by bolstering strategies in the hospitality, commercial and manufacturing sectors and ongoing diversification into new economic sectors (ICT, seafood and financial services). The demand has also increased due to the breakthrough of automation and the penetration rate of electric home appliances.

Local and renewable energy sources are biomass, hydro, solar and wind energy. Biomass energy consists mainly of bagasse, a by-product of the sugar industry, and contributes about 22% of the primary energy supply. Fuel wood and charcoal are minimally used. Hydropower plants, with a combined installed capacity of 59MW, is virtually the entire hydro potential. Furthermore, Mauritius has a good solar regime with a potential average annual solar radiation value of some 6kWh/m²/day. The wind regime in Mauritius is very good in some areas, with an annual average speed of 8.1 m/s at 30 m above ground level.



Electricity Laws

- Electricity Act 1939 and regulations made thereunder – making provision for and in the connection and licensing of electricity services, the safety of electrical installations, the establishment of an Inspectorate, the determination of tariff.
- Energy Efficiency Act 2011 and regulations made thereunder – setting up the Energy Efficiency Management Office.
- Central Electricity Board Act 1963 pledging of debentures and debenture stock in respect of the CEB, collection of license fees, fixing the powers of the minister and the conditions when it comes to exemption from income tax.

- and use of renewable energy.
- Utility Regulatory Authority Act 2004 providing for the establishment and

• Mauritius Renewable Energy Agency Act 2015 – an Act to provide for the establishment of the Mauritius Renewable Energy Agency for the purpose of promoting the development

management of a Utility Regulatory Authority.





Regulators

The main regulators are:

- Utility Regulatory Authority (URA): The URA was set up in 2016 by the Utility Regulatory Authority Act 2004 to act as an independent body to regulate utility services, including electricity. In relation to the energy sector, the URA sets and regulates tariffs for electricity, resolves complaints related to utilities and acts in an advisory capacity to the government on relevant policy and legislative issues as well as assisting with policy implementation. The URA also has a role in ensuring sustainability of services, protecting customer interests, promoting efficiency in operations and capital investments in utility services and promoting competition in the section. It also grants, varies and revokes utility licenses and monitors compliance by licensees with standards and applicable regulations.
- The Central Electricity Board: A parastatal body wholly owned by the government of Mauritius and reporting to the Ministry of Energy and Public Utilities. It is empowered by the Central Electricity Board Act 1963 to "prepare and carry out development schemes with the general object of promoting, coordinating and improving the generation, transmission, distribution and sale of electricity" in Mauritius. The primary responsibility of the URA is, but is not limited to, the economic regulation of electricity and water services as well as wastewater disposal services, as provided for in the Utility Regulatory Authority Act, 2004.

The URA is an independent body and its objectives are to:

- ensure the sustainability and viability of utility services;
- protect the interests of both existing and future customers;

- levied by a licensee;
 - mediate or arbitrate disputes between customers and licensees;

• promote efficiency in both

operations and capital investments

in respect of utility services; and

promote competition to prevent

unfair and anti-competitive

industry.

Its main functions are to:

practices in the utility services

implement the policy of government

relating to applicable utility services;

enforce the conditions laid down in

regulate tariffs and other charges

• grant, vary and revoke licenses in

an undertaking authorization;

respect of a utility service;

• establish and implement adequate systems for monitoring the

compliance by licensees with standards and applicable regulations and making such information publicly available;

- protect the interest of customers in relation to any utility services; and
- examine and make recommendations to a licensee in respect of any Power Purchase Agreement.

The Mauritius Renewable Energy Agency (MARENA): Enacted by the MARENA Act of 2015, MARENA was created in 2016 to oversee the development of renewable energy in Mauritius. It is responsible for promoting renewable energy and creating an environment conducive to the development of renewable energy, including creating necessary mechanisms, frameworks and standards • devising accreditation to enable an increase in the use of renewable energy and an increase in the number of renewable energy projects. MARENA's role includes:

- advising the minister on renewable energy policy and strategy;
- elaborating a renewable energy strategic plan (every five years);
- assessing the feasibility and competitiveness of renewable energy projects and making recommendations;
- promoting and supporting research and development into renewable energy technologies;
- developing guidelines and standards for renewables projects and for evaluation and approval of on and off grid renewable projects;
- defining a funding strategy for renewables projects; and
- principles for operators in the renewables sectors.

Generation, distribution and transmission

Transmission, distribution and the
sale of electricity in Mauritius are
undertaken solely by CEB, whodistribution system supplies electric
at lower voltages from its substation
to various customers' premisescurrently produce 40% of the country's
total electricity requirement. This is
done via four thermal power stations
and eight hydroelectric plants.through 22kV-to-415V and 6.6kV-
to-415V distribution transformers.and eight hydroelectric plants.The transmission network consists
of 16 major substations and 300 k
of single-circuit transmission lines.requirement is purchased from IPPs
consisting predominantly of private
and imported coal.The and inported coal.

The transmission network, operating at the highest voltage of 66kV, transports power in bulk from the main sources of generation to various 66kV-to-22kV substations Presently, the CEB delivers electricity to approximately 422,000 customers scattered over the island. The CEB's distribution system supplies electricity across the island through its distribution system. Traditionally, the at lower voltages from its substations to various customers' premises flow of electricity in the distribution network was uni directional from the to-415V distribution transformers. CEB's substations to its customers. Since 2011, the distribution system The transmission network consists of 16 major substations and 300 km has undergone a major change as of single-circuit transmission lines. customers are henceforth able to The transmission network is made up generate their own electricity and of a mix of underground cables and export the excess to the distribution overhead lines. Overhead lines, which network. form around 94% of the network, greatly predominate because of their practicality and lower costs.



Renewable Energy Overview



While bagasse remains the key source of renewable energy (89%), 4.2% of electricity generation comes from hydro, wind, landfill gas and solar PV.

The home solar project was launched in May 2018. This project aims at installing solar photovoltaic systems on rooftops of 10,000 households in Social Category tariff 110A as part of the government's efforts to alleviate poverty whilst contributing to the national target of achieving 35% of renewable electricity in the energy mix by 2025. The country welcomes all types of renewable energy projects, in line with international best practices Other transformational energy in the sector.

Offshore wind farms have future potential in Mauritius. In 2009 the government released its long-term energy strategy, which laid out its plans

by the earth, and offshore wind farms to increase the use of renewables in Mauritius from 20% to at least 35% which, following preliminary results by 2025. by the Mauritius Research Council, demonstrate the potential for large scale developments in the waters of The micro-climate generated by the unique topology of Mauritius, its Mauritius and Rodrigues. attractive investment climate and Current issues in the existing research institutions working renewables industry on renewable energy projects, are the key assets of Mauritius as Mauritius is vulnerable in terms of a test base for R&D projects that high population density and fragile can be replicated on a regional ecosystems. The supply, distribution and utilization of energy are critical scale. Moreover, opportunities for issues for the country's future. In this collaboration exist for the use of the context, the challenges of energy waters of Mauritius as a test base for

marine renewable energy projects. management are typically of a particularly politico-economic nature. projects include: Deep Ocean Water Applications (DOWA) that exploit deep sea water currents for cooling and other uses, geothermal energy (currently under study) which taps into the potential of heat generated



Government Incentive Schemes



CEB is constantly integrating Small-Scale Distributed Generation (SSDG) using PV technologies, from residential, commercial and even industrial customers. CEB has launched a second phase of SSDG after the success of phase one. Under SSDC, customers generating electricity using solar energy will offset their monthly energy imported from the grid, if any, with the energy generated by their PV installations, exported to the grid and bank (store) any excess energy in the grid, in the form of kilowatt-hour (kWh) credits.

There are tax incentives for investments in renewable energy projects and/or equipment, including:

- all interest income derived from debentures issued to finance renewable energy projects, previously taxed at 15%, will be exempted from tax provided that the projects have been approved by the MRA; and
- investment in solar energy units can be deducted in the form of investment allowance.

Major Projects/Companies



- SARAKO 15.2MW Solar Power **Farm** in Bambous, operational since February 18, 2014.
- Solar Field Ltd in Mont-Choisy, a 2MW solar facility, operational since January 30, 2017.
- Synnove L'Esperance Moka (Synnove Solar (Mauritius) One Ltd) in L'Esperance, a 2MW solar plant, operational since January 4, 2017.
- Synnove in Petite Retraite (2MW solar project), operational since January 4, 2017 and pending 8.64MW extension.
- Eole Plaine des Roches Wind **Farm** in Plaine des Roches, operational since March 15, 2016. Consists of 11 wind turbines of 580kW each.
- Home Solar Project, operational since May 2018 – it helps low-

income communities to be energy sufficient, save energy costs and protect the environment.

- Agrinergie project under construction. A 17MW solar project located in Henrietta jointly developed by the Akuo Energy Indian Ocean teams and Medine.
- The CEB signed an Electricity Supply and Purchase Agreement in relation to a 9MW wind farm in 2016 with a French company, Quadran, in joint venture with a local partner.
- A 29.4MW wind farm project, involving Indian firm Suzlon in joint venture with a local partner Padgreen Ltd, has not yet started operations. A date for completion of construction is currently scheduled for July 2018.







Foreign Investment/Ownership



Of the 33 economic sectors looked at in the World Bank report, 32 are fully open to foreign investment in Mauritius. The only exception is television broadcasting, where foreign capital participation in a company must be less than 20%. However, the World Bank report draws attention to the difficulties of investing in certain sectors in Mauritius such as electricity generation and distribution, waste management and recycling, and port and airport management, due to their monopolistic market structure and domination by a state-owned enterprises.



UNFCCC – Paris Commitments and beyond



Mauritius was one of the first countries to ratify the Paris Agreement in April 2016, and have set a target of 30% emissions reduction by 2030, compared to a business as usual emissions level of 7 million tonnes of CO_2 e. The target, which is equivalent to a 4% cut on emissions levels in 2014, is conditional on Mauritius obtaining international support.

Relevant Resources and References



Relevant Websites

CIA World Fact Book – https://www.cia.govilibrary/publications/the-worldfactbook/geos/mp.html_

International Trade Administration – <u>https://www.export.gov/</u> article?id=Mauritius-Renewable-Energy

Ministry of Energy and Public Utilities – <u>http://publicutilities.govmu.org/English/</u> Pages/Publications.aspx

Mauritius Board of Investment – <u>http://www.investmauritius.com/</u>

Carbon Brief: Country climate pledge tracking – <u>https://www.carbonbrief.org/</u> paris-2015-tracking-country-climate-pledges

Mauritius launches an Expression of Interest for Offshore Wind Farms – http://www.investmauritius.com/investment-opportunities/energy.aspx_

Expressions of Interest for the Development of Offshore Wind Farms for the Republic of Mauritius - http://www.investmauritius.com/media/414322/E0I-Offshore-Wind-Farms_060317.pdf







Morocco

Overview

KEY FACTS

Jurisdiction: Civil law and the Constitution of the Kingdom of Morocco of 2011.

Language(s): Arabic (Official Language), French.

BUSINESS ENVIRONMENT

2019 Doing Business Report: 60 of 190

2018 Global Competitiveness Inde 75 of 140

2019 Index of Economic Freedo 75 of 180

2018 Corruption Perception Ind 73 of 180

2018 UN Development Program Human Development Index: 123 of 188

Population: 36.6 million

GNI per capita (2017): USD2,860

PROFILE

| | Considered as of one the most |
|------|-------------------------------------|
| | developed economies in Africa, |
| | the Moroccan economy is marked |
| lex: | by steady growth, low inflation and |
| | gradually falling unemployment. |

| om: | The Moroccan economy continues |
|------|---------------------------------------|
| | to attract foreign investment. |
| | The attractiveness of Morocco is |
| dex: | associated, on one hand, with its |
| | political stability and its generally |
| | favorable business environment. |
| N | On the other hand, the Moroccan |
| | government has recently introduced |
| | a number of important economic |
| | reforms in order to attract more |
| | foreign investment. |
| | |

Electricity Industry Overview



The electricity market in Morocco is partially open to competition for the production and commercialization of electrical energy from renewable energy sources for customers connected to VHV/HV/MV.

Annual demand of imported fossil fuel increase of 8% since 2011. According to the Moroccan Ministry of Energy, Mines and Sustainable Development, future primary energy demand could reach 26 Mtoe in 2020 and 43 Mtoe in 2030, The Ministry estimates that national consumption could reach 49 TWh/y by 2020 and 65 TWh/y by 2025.

Depending entirely on the international primary energy market to satisfy the growing local demand of electricity, Morocco has implemented its National Energy Strategy aiming to reach a share of 52% of installed power capacities from renewable energy sources by 2030,

Energy efficiency in parallel with the development of renewable energy forms a major part of Morocco's energy strategy, Morocco's energy strategy aims at saving 12% in 2020 and 15% in 2030 of its total energy consumption.

Electricity Laws

- The Law No. 16-08 modifying and completing the Dahir No. 1-63-223 of August 5, 1963 creating the Moroccan Water and Electricity Company. This law grants public or private operators, at their request, and subject to the prior authorization of the Moroccan Ministry of Energy, Mines and Sustainable Development, the right to produce electricity for their own needs.
- The Law No. 13-09 on renewable energy promoting renewable energy production and providing framework for developers and investors in clean energy projects. According to this law, the electricity produced by the operator of a renewable energy power generator may be sold to local private entities or may be exported. However, this regime is subject to a prior authorization from the Moroccan Ministry of Energy, Mines and Sustainable Development. New amendments to this law are contemplated. The aim of the new draft is to amend the regulatory framework for renewable energy production to ensure more transparency.
- and focus on energy efficiency.
- The Law No. 57-09 relating to the the Law No. 13-09).

The Law n° 16-09 creating the Moroccan Agency for Development of Renewable Energy and Energy Efficiency (ADEREE) to develop and promote renewable energy and energy efficiency. ADEREE is now called Moroccan Agency of Energy Efficiency (AMEE)

establishment of the Moroccan Agency for Solar Energy (MASEN) to carry out a program for developing integrated solar power generation projects with a total capacity of 2000MW. MASEN is now called Moroccan Agency for Sustainable Energy and is in charge of the realization of all renewable energy projects (except the projects under

• The Law No. 58-15 modifying and completing the law No. 13-09 on renewable energy. This law increased the minimum threshold of hydropower plants from 12MW to 30MW.



Regulators

- The Moroccan Ministry of Energy, Mines and Sustainable Development. The Moroccan Ministry of Energy, Mines and Sustainable Development established the legal framework for the sector, ensures the practical implementation of the national energy strategy and oversees a number of subordinated agencies and departments.
- The Moroccan Water and **Electricity Company – ONEE.** ONEE has a dominant role in Morocco's electricity markets as it operates throughout the
- whole value chain: generation, transmission and distribution.

- The Moroccan Agency for Sustainable Energy – MASEN. MASEN is responsible for managing renewable energy in Morocco.
- MASEN leads development program of integrated projects aimed at creating an additional 3,000MW of clean electricity generation capacity by 2020 and a further 6,000MW by 2030, The goal is to secure 52% of the country's energy mix from renewable sources by 2030.
- The Moroccan Agency for Energy Efficiency – AMEE.

AMEE's mission is to contribute to the implementation of the government's policy on the promotion of renewable energy and energy efficiency. Its mission includes:

- supporting the administration by proposing national and regional plans and incentives for renewable energy and energy efficiency development; and
- realization, promotion, management, monitoring and coordination of renewable energy and energy efficiency development programs within the framework of the national strategy.

Generation, Distribution and Transmission

ONEE is the sole buyer and seller and the sole importer/exporter of bulk electricity.

Exceptions to the monopoly role of ONEE have been introduced following the entry into force of the laws No. 13-09 and 16-08, which allow for direct contracting between the operator of a renewable energy power generator and industrial customers connected to VHV/HV/MV.

ONEE, however, holds a monopoly on the transmission of electricity and is responsible for the construction, operation and maintenance of the electric transmission system as well as planning development of the electricity network.



Renewable Energy Overview



SOLAR

As part of its strategy towards energy use, Morocco gives priority to developing renewable energy and sustainable development. With abundant solar resources (a potential of 2,600kWh/m²/year) and a strategic position at the heart of an energy hub, Morocco offers a wide range of investment opportunities in the sector of thermal and photovoltaic solar energy, including the launch of the following structuring programs.

WIND

As part of its strategy towards energy use, Morocco has undertaken a vast wind energy program, to support the development of renewable energy and energy efficiency in the country.

biogas. Morocco also has plans to Project, spanning over a period of ten years with a total investment generate bioenergy using household waste and biogas using wastewater. estimated at MAD31.5 billion will enable the country to bring the The aim is to strengthen the biomass installed capacity, from wind energy, sector, with a view to replacing fuel oil from 280MW in 2010 to in the industrial sector. 2,000MW in 2020.

HYDROPOWER

The major issue confronting the Hydropower is a traditional component of Morocco's renewable renewable energy sector in Morocco energy industry. Hydro-electric power is the slow authorization procedures, capacity is expected to reach 2,000MW particularly in terms of technical by 2020 and up to 3,100MW by 2030. approval through the Moroccan Water and Electricity Company.

BIOMASS

Morocco's large agricultural sector and the fact that a large part of the waste generated is made up of organic components are a boon to The Moroccan Integrated Wind Energy power generation from biomass and

Current issues in the renewables industry



Government Incentive Schemes



The Moroccan government has carried out substantial reforms in order to shape a legal, regulatory and institutional framework that would stimulate renewable energy development.

The law no. 13-09 aims at promoting and liberalizing the renewable energy sector but does not introduce fixed tariffs. It requires, however, that all economic and technical be set and negotiated by the producers directly with the grid operator ONEE.

There is, however, no implemented feed-in tariff in Morocco or specific tax incentives.

Major Projects/Companies

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- The Moroccan project of Solar Energy aims at providing a capacity of electricity production of 2,000MW by 2020, The project is situated in five major sites: Ouarzazate, Ain Beni Mathar, Foum Al Oued, Boujdour and Sebkhat Tah. The two technologies – concentrated solar power (CSP) and photovoltaic – are designated to be used in these stations. This project is developed by MASEN.
- The Moroccan Integrated Wind Energy Project will enable Morocco to increase the capacity of its wind projects, from 280MW in 2010 to 2,000MW by 2020,
- Major projects:
 - Tarfaya (300MW) operated by Engie and Nareva.

- Akhfenir (200MW), Foum El Oued (50MW) and Haouma (50MW) operated by Nareva.
- Jbel Khalladi (120MW) operated by Acwa Power.
- The development of new wind energy farms is planned as follow:
 - Taza (150MW) awarded to EDF EN and Mitsui.
 - The 850MW project: Tanger 2 (150MW), Tetouan (300MW), Tiskrad Laayoune (300MW) and Boujdour (100MW) awarded to Enel Green Power, Nareva and Siemens.



Foreign Investment/Ownership



Morocco actively encourages foreignForeign and domestic private entitieinvestment. There is no requirementmay establish and entirely ownfor a foreign investor to partner with abusiness enterprises, barring somelocal shareholder.sector restrictions (national bank, air

The Moroccan Agency for Investment and Export Development (AMDIE) is Morocco's primary agency responsible for the development and promotion of investment in Morocco. Moroccan legislation governing foreign direct in applies equally to Moroccan and foreign legal entities, with the exception of certain protected sectors.

Foreign and domestic private entities
may establish and entirely own
business enterprises, barring some
sector restrictions (national bank, air
and maritime transport companies,
phosphate extraction).Moroccan law provides under the
investment charter specific financial,
tax and customs advantages for
investors, as part of agreements or
investment contracts to be concluded
with the state, provided that they meet
the required criteria.There is no requirement for priorImage: Conclusion of the state of the

There is no requirement for prior approval of foreign direct investment, and formalities related to investing in Morocco do not pose a significant barrier to investment.

UNFCCC – Paris Commitments and beyond



On September 21, 2016, Morocco ratified the Paris Agreement, and submitted its Nationally Determined Contribution, with a target of reducing greenhouse gas emissions including land use, land use change and forestry by 17% by 2030. With sufficient international support, Morocco aims to further decrease emissions by 42% by 2030.

Relevant Resources and References



Relevant Websites

Moroccan Ministry of Energy, Mines and Sustainable Development – <u>www.mem.gov.ma/</u>

Moroccan Water and Electricity Company – <u>www.one.org.ma/</u>

Moroccan Agency for Energy Efficiency – <u>www.amee.ma/index.php?lang=en</u>

Moroccan Agency for Sustainable Energy – MASEN – www.masen.ma/

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Renewable Energy in Africa

Mozambique – Overview



Mozambique Overview

KEY FACTS

Jurisdiction: Mozambican civil law, the Constitution of the Republic of Mozambique.

Language(s): Portuguese.

BUSINESS ENVIRONMENT

138 of 190 (down 1 ranking)

Mozambique, located on the east coast of Africa, borders Tanzania, Malawi, Zambia, Zimbabwe, South Africa and Swaziland. Originally a Portuguese colony before gaining its independence in 1975, Mozambique has since been one of Africa's fastest growing countries, at a rate of approximately 9% for the majority of the last decade. Mozambique benefits from ample arable land, water, energy, as well as newly discovered natural gas and mineral resources offshore, and accordingly around 67% of its population reside and work in rural areas. Mozambique relies heavily upon foreign assistance due to the majority of its population living below the poverty line.

91

2018 Doing Business Report: 2018 Global Competitiveness Index: 136 of 138 (down 3 rankings) 2017 Index of Economic Freedom: 158 of 180 (down 19 rankings) 2016 Corruption Perceptions Index: 142 of 176 (down 30 rankings) 2016 UN Development Programme Human Development Index: 181 of 188 (down 1 ranking) Population: 28.9 million (2017

Population Census)

GNI per capita: USD1,190

PROFILE

Electricity Industry Overview

The Mozambican Energy market is state-controlled, and such control is conducted through Electricidade de Mocambique (EDM), the national utility company, as the sole off-taker entity and manager of the national grid, through supervision of the Energy Regulatory Authority (ARENE).

Mozambique's energy potential is one of the highest in Southern Africa, with installed generation capacity of around 2,905.45MW and substantial energy resources, including hydro, solar, wind, geothermal, natural gas and coal. Almost 100% of power currently generated is from hydroelectric power, mostly through the Zambeze Basin. The geographical positioning of the country gives Mozambique a privileged, strategic position and role in the regional energy sector, acting both as a route to the countries inland well served by harbors, railway and pipeline systems and as an interface between

the Southern African Development Community and the Eastern African Community. The import and export of electricity in Mozambique has increased positively throughout the years; however, in relation to the rate of exported electricity particularly to South Africa, according to the September 2017 Renewables report in Mozambique, there is a report of a drop from 98% to 77%.

At present only approximately 24.8% of the Mozambican population has access to electricity. This is due to an undeveloped power distribution network and bureaucracy involved in developing new power projects. The government has set a five-year plan (2015-2019) which aims to increase access to electricity. Mozambique's aim is to enable access to electricity for 50% of the population by 2023, and achieve universal energy access by 2030.

Electricity Laws

- Law No. 15/2011, of August 10 (Public Private Partnership Law or PPP Law).
- Law No. 21/97, of October 1 (Electricity Law).
- Decree No. 11/2017, of September 8 (creates the Regulating Authority of Energy).
- Decree No. 58/2014, of October 17 (Regulation Establishing the Tariff for New and Renewable Energy).
- Decree No. 16/2012, of June 4 (Public Private Partnership Law or PPP Law Regulations).
- Decree No. 48/2007, of October 22 (Regulations of Licenses for Electric Installations).

- National Power Transportation Grid.
- system for the sales of Electricity).
- Award Regulation).
- Development Policy).

Decree No. 43/2005, of November 29 (National Grid Management Regulations), in which the government appointed EDM as the entity responsible for management of the

Decree No. 29/2003, of June 23 (The tariff

Decree No. 8/2000, of April 20 (Concession

Resolution No. 62/2009, of October 14 (approves the New and Renewable Energy

Regulators

Ministry of Mineral Resources and Energy (MIREME) as it is today was created in 2015 and oversees the extractive industry and the power sectors and: (i) plans, manages, supervises and ensures the execution and compliance of the government policy in relation to the undertaking of geological investigations; (ii) supervises the exploration of mineral and power resources; and (iii) supervises the development and expansion of infrastructure for the supply of electrical power, natural gas and petroleum products.

Electricidade de Mocambique (EDM) state-owned company is governed by Law No. 6/2012 of February 8 (the State Owned Companies Law) and is overseen by MIREME. EDM is the sole electricity utility and electricity off-taker in the country. EDM is active on the entire value chain, from generation, transmission, distribution and trade of electricity in Mozambique EDM was appointed as the National

Grid Manager, which is the entity Energy Regulatory Authority (ARENE) responsible for management of the - supervises, regulates, represents, National Power Transportation Grid. inspects and has sanctioning powers pursuant to the law. It launches and EDM has 20% of the country's generated capacity and it receives all power oversees the public tender process for produced by IPPs. EDM buys most of new power concessions. its power supply from Hidroelectrica de The National Energy Council (Conselho Cahora Bassa (HCB), the largest hydro Nacional de Electricidade) (CNELEC) facility in Mozambique. The majority was re-established as an independent of the electricity generated at HCB is advisory regulatory body for the exported to South Africa, with a small electricity sector in early 2008. CNELEC amount to Zimbabwe. was instructed to conduct a review of To mitigate the cost of expanding the the current methodology used by EDM grid to rural areas the government in setting tariffs. CNELEC has since made rural electrification development a December 2017 been closed down and priority led by the Mozambique Energy replaced by ARENE. Fund (FUNAE) which was established The National Directorate of Electricity in 1997. FUNAE is responsible for

the promotion of the development, generation and use of several forms of low cost energy, for the purpose of subsequent supply to rural and inhabited urban areas. FUNAE focusses on smaller off-grid projects of less than 10MW.

is a MIREME subordinate department responsible for approval of power projects implementation, approvals to conduct feasibility studies, as well as issuance of authorizations related to the establishment and operation of electrical installations, among others.

Generation, Distribution and Transmission

Historically, the then regulatory authority CNELEC had limited powers to oversee the sector, due to the fact that EDM in practice had ended up playing this role, being both a referee and a player within the same market. A new regulatory authority ARENE with broader powers has been instituted, and is now operational.

EDM's main purpose is to provide the public service of generation, transmission, distribution and sale of energy in the national territory, conduct the import and export of energy in Mozambique, as well as conduct installation, maintenance and renewal of goods and equipment allocated to the exploration and undertaking of public services.

EDM's roles also include, the execution of contracts with consumers, in relation to the installation or rent of equipment, obtaining financial means required for the development of the power sector, conducting or managing feasibility studies, as well as providing required training.

In the prosecution of EDM's mandate, EDM shall seek to extend the National Transmission Grid, introduce innovation in the power domain, as well as conduct a strict management of the funds and commercial aid.

EDM is the primary supplier of electricity to consumers, but the law also allows for the participation of IPPs and related third-party access to the grid. However, in practice in order to make the power projects feasible, EDM always enters into partnerships with IPPs in order to generate electricity on one side and buy from the other side. The National Transmission Grid Regulation allows and regulates third-party access to the electrical work.

The power to MOZAL, an aluminium smelter company, is supplied through High Voltage Direct Current lines, owned by MOTRACO, a joint venture transmission company between Eskom, EDM and Swaziland Electricity Board.

Renewable Energy Overview

Mozambique holds a wide range of renewable energy resources within the country which covers sufficient amounts for export. It has a total renewable potential of over 23,026GW. Solar energy is the most abundant renewable resource in Mozambique with a potential of 23,000GW. Statistics published in the Renewables in Mozambique-National Status Report/ October 2017.

The national renewable market has been recently developed, and finds itself in a stage of legal, tax and regulatory framework development. Due to the noticeable abundance of renewable resources and the government developing the renewable energy sector as a strategic policy, the government conducted an audit on the different sources of renewable energy in Mozambique, which resulted in the compilation of the Renewable Energy of Mozambique Atlas (the Atlas) and the Renewable Energy Projects Portfolios. This audit sought

to create a map of the potential development sites and assess the potential for power generation from each of the existing renewable resources, and identify and study several projects at a technical and economic prefeasibility level, by way of attracting investors to the renewable sector.

HYDROPOWER

The largest power generation plant is the Cahora Bassa hydro dam operated by the government-owned HCB. This is the second largest dam in Africa, with a capacity of 2,075MW. HCB sells 65% of its existing generation to South Africa and the remaining 35% is sold to the northern regions of Mozambique and to Zimbabwe. HCB's operations are located on the Zambezi River in Tete Province.

The average rainfall in Mozambique is 1,023mm/m². In 2013 the country held in 2016. 104 drainage basins, of which 11 have high hydrographic potential. The Atlas

identified a total of 1,446 new possible hydropower projects with an estimated potential of 19GW, with 351 priority projects with an estimated potential of 5.6GW.

SOLAR

The country's global irradiation varies between 1,785 and 2,206kWh/m²/year. Solar is abundant in the Tete province, Niassa, Nampula, Cabo Delgado and Zambezia provinces. The project portfolio has identified a total of 343 projects distributed in the provinces referred to above, among which the Atlas establishes 189 locations for the possible development of solar projects and highlights 43 priority projects. Mozambique's first utility-scale solar power plant, a photovoltaic plant with a capacity of 40MW, was commissioned in Zambezia Province

WIND

There is a special focus on wind energy in the South. However, several other locations throughout the territory also provide conditions for the development of projects at reasonable prices. Despite the high generation potential of wind power projects, Mozambique currently has in the pipeline a small number of wind projects due to the higher complexity of the technology, the means of transportation, storage and assembly of equipment. Winds are of mediumlow intensity, with speed ranging from 4 to 6 m/s at an altitude of 80 m. Mozambique has a potential of 4.5GW, of which 1.1GW has a potential grid connection. Mozambique plans to build 100MW of onshore wind energy and 125MW of small hydro power by 2025.

BIOMASS

Mozambique has great potential for harnessing bioenergy, particularly from forest biomass and agricultural biomass (farming residues). The residues from forestry activity could generate 750GWh of energy, and an estimated 3.1 million barrels of oil equivalent of biofuel without affecting the biodiversity.

GEOTHERMAL

The country has geothermal potential in the north of Mozambique of 147MW, of which 20MW are priority projects. As of 2013, no geothermal projects had been identified. Despite higher risk and cost, geothermal projects offer the possibility of supporting the quality of energy and electrification in Niassa province, in particular.

Current issues in the Renewables Industry

The legal framework remains under development. The natural power grid and respective infrastructure requires improvement The government has been working towards developing strategies to eliminate constraints within the sector, and has enacted the Resolution No. 62/2009, of October 14, 2009 (which approves the New and Renewable Energy Development Policy).

Renewables Laws

The renewable energy sector legal framework is relatively new in Mozambique, and is currently still under development. As a result, the renewables sector largely relies on general legislation concerning the electricity sector (see above).

As well as the electricity law, the key renewables laws are:

- Decree No. 58/2011, of November 11 (Regulation on Fossil Biofuels); and
- Resolution No. 22/2009, of May 21 (Biofuel Policy and Strategy).

Government Incentive Schemes

The government published a notice on September 21, 2017 in a local newspaper regarding the launch of a portfolio of potential sites for the development of renewable energy projects (based on the Atlas), estimated at the approximate amount of USD500 million.

Furthermore, the government is extending the opportunity of financing renewable energy projects in Mozambique to private entities, with the purpose of making way for investment in this sector, and increasing the Mozambican population's access to electricity, particularly to 332 villages within the Mozambican territory.

The government has also created a Pursuant to the Draft Electricity Law Bill sponsors making use specific tariff regime for the renewable of renewable energy sources to energy sector, namely the REFIT tariff, which provides attractive advantages develop a project in Mozambique, would require a standard to those within the renewables sector (for instance, preferential fees administrative License, as opposed for the sale of electricity in projects to current fully-fledge Concession up to 10MW), in order to promote as provided by the current Electricity by Law No. 4/2009, of January 12, development of renewable energy and Law. Of note that the process to obtain a license in comparison to a investor interest. Concession, would be much easier

Moreover, apart from incentive schemes mentioned above, the government is currently reviewing the Electricity Law. The Draft Electricity Law Bill introduces reforms to easy the licensing of new power projects, particularly the development of small dimension power projects.¹

Projects with installed nominal capacity less than 50MW and greater than 4MW.

The Draft Electricity Law Bill also provides for a longer validity of the authorization required for a project, in comparison to the current Electricity Law, increasing the maximum term from 25 to 35 years, therefore creating a more appealing and friendly business environment.

and quicker.

The government also allows certain projects to benefit from tax benefits and exemptions for custom duties on the import of equipment.

In accordance with the provisions of the Fiscal Benefits Code, approved investors may be granted:

exemption from customs duties and value added tax (IVA) on goods and equipment falling under class K of the Customs Tariff (Pauta Aduaneira) and respective parts and accessories relating to such plant and equipment;

- a reduction in the rate of the Corporate Income Tax (Imposto sobre o Rendimento das Pessoas *Colectivas – IRPC)* by 80% in the first five financial years from the Commercial Operation Date;
- a reduction in the IRPC rate by 60% from the sixth to the tenth financial years; and
- a reduction in the IRPC rate by 25% from the 11th to the 15th financial years.

Major Projects/Companies

- HCB (Hidroeléctrica de Cahora **Bassa)** – restarted functioning in 1997 with capacity of 2,075MW.
- CTRG (Central Térmica de Ressano Garcia) – in February 2015 the Ressano Garcia Gas Power Plant started operations, holding a 175MW installed capacity.
- **Gigawatt** in November 2015 Gigawatt inaugurated its gas powered plant with an installed capacity of 120MW, of which 100MW are allocated to the supply of EDM.

The following projects are in the pipeline:

- Cahora Bassa Norte Hydroelectrical power project with a capacity of 1,245MW.
- Mphanda Nkuwa Hydroelectrical power project with a capacity of 1,500MW.
- **ACWA Power** Coal fired thermoelectrical power project a with capacity of 600MW.
- **JINDAL** Coal fired thermoelectrical power project a with capacity of 150MW.
- Scatec Mocuba 40MW solar • project (to be commissioned in December 2017).

Foreign Investment/Ownership

Shares corresponding to a 5% interest in the project must be listed on the Mozambican Stock Exchange from the fifth year of commercial production, or be guaranteed by the state or other appointed public entity appointed (here, EDM) in a percentage not less than 5% nor greater than 20% of the referred capital (Article 33(1) (a) of the PPP Law and Article 64 of the PPP Law Regulations). This obligation promotes inclusion of Mozambican natural persons in the local market.

In regards to foreign ownership, the project shall be held by the SPV (incorporated under the laws of Mozambique) up to the expiry or term of the concession contract, when it shall revert to the government at the payment of an established price. The price is established by the concessionaire and the government during the negotiation of the Power Concession Contract, (i.e. the Power Concession Contract will include a

clause which provides a mechanism for the calculation of the residual price).

The government has extended the opportunity of financing renewable energy projects in Mozambique to private entities, financing may be provided by foreign lenders, national banks, development banks and international cooperation agencies.

To encourage the financing or foreign investment of renewable projects in Mozambique, the government provides attractive conditions, including customs and fiscal incentives as referenced above.

FOREIGN EXCHANGE CONTROL

Foreign Exchange Control is governed by:

a Law No. 11/2009, of March 11 (Foreign Exchange Law); and

b Notice 20/GBM/2017, of December 22 (Foreign Exchange Rules and Procedures).

(a) to (b) above are together the Foreign Exchange Regulations. Foreign Direct Investment (FDI) in Mozambique does not require prior authorization and shall only

- be subject to registration with the commercial bank.
- When the FDI is implemented by the import of equipment, machinery and other material goods as well as in form of intellectual rights, the registration shall be effected with the Central Bank, through the
- commercial banks.
 - The registration of funds grants the applicant the right to export dividends and repatriate any funds brought into the country in case of divestment. There is a minimum FDI requirement of MZN2.5 million (USD41,666). Failure to register FDI for a period of three

years counting from the date of entry of funds or equipment into the country will result in non-recognition of the right to export dividends and repatriation of the invested capital in case of divestment.

EXTERNAL LOANS

Investment in the form of external shareholder loan is allowed. Shareholder loans and related companies' loans are subject to Central Bank of Mozambique approval. According to Foreign Exchange Rules and Procedures, shareholder loans and related companies' loans for any amount are already pre-approved and only subject to registration with the commercial banks, provided the following conditions are met:

- the interest rate is 0%;
- maturity of the loan is equal or superior to three years; and
- the loan is encumbrance free and commission free.

Shareholder loans and related companies' loans which charges interest rates are pre-approved for an amount up to the equivalent to USD5 million and only subject to registration with the commercial banks, provided the following conditions are met:

- the interest rate is higher than 0% but inferior to the base lending rate of the loan denomination;
- maturity of the loan is equal or superior to three years; and
- the loan is encumbrance free and commission free.

Third-party external loans are subject to Central Bank of Mozambique approval. According to the Foreign Exchange Rules and Procedures, external loans up to the amount correspondent to USD5 million are already pre-approved and only subject to registration with the commercial banks, provided the following conditions are met:

- the interest rate is not higher than the base lending rate of the denomination currency of the financing, added by four base points;
- the sum of the base lending rate and the margin does not exceed the interest rate practiced in the national banking system; and
- the loan has a maturity equal or higher than three years.

The transfer of funds abroad, resulting Shareholder loans, related companies' loans and third-party external from FDI, in the form of profits or distributed dividends, loans and loans which do not comply with the requirements mentioned above will shareholders' loans, in the form of require prior authorization from the interest, portfolio investments and other forms of capital investment no Central Bank. The Central Bank, when analysing the request, considers longer require authorization from the solvency ratio of the company the Central Bank of Mozambique; requesting the loan in order to analyze however, the transaction must the financial strength of the company be registered with the Central in order to make the debt service. Bank of Mozambique through the intermediary bank (Article 57 of the The company is considered stable when its equity is equal to or above Foreign Exchange Law Regulations). 30% of the loan amount.

Also of relevance in this case is the applicable interest rate, which shall not be higher than the interest rate practiced in the internal market.

UNFCCC – Paris Commitments and beyond

Mozambique ratified the Paris Agreement in November 2017, the country's Intended Nationally Determined Contribution (INDC) states the government's intention to work with development partners to improve climate change related date management systems and implement a robust low emission development path with the hope of reducing per capita emissions from 1.4 t CO_2 e per capita in 2010 to around 0.7 to 0.8 t CO₂e per capita in 2030 compared to expected business as usual emissions of around 1.5 t CO_2 e per capita over this period.

Relevant Resources and References

Relevant Websites

https://www.globallegalinsights.com/practice-areas/energy-laws-andregulations/mozambique#chaptercontent1

https://www.export.gov/apex/article2?id=Mozambique-Energy

http://global-climatescope.org/en/country/mozambique/#/enabling-framework

http://www.funae.co.mz/

http://www.edm.co.mz/

http://www.portaldogoverno.gov.mz/

http://www.ine.gov.mz

http:/www.mireme.gov.mz

Namibia

Overview

KEY FACTS

Jurisdictions: The Namibian judicial branch operates a traditional court structure. The legal system is a combination of Roman-Dutch common law, customary law, international law elements that can be traced back to Westminster style law.

Languages: English (official), Afrikaans, German, Oshivambo, Herero, Nama.

BUSINESS ENVIRONMENT

2018 Doing Business Report: Saara Kuugongelwa-Amadhila has 107 out of 190 economies (up 1) been President since 2015 and her party, South West Africa People's 2018 Global Competitiveness: Organisation (SWAPO), is expected to 90 out of 137 (down 6) dominate in the 2019 elections. The 2017 Index of Economic Freedom: economic outlook is for slow growth, 174 out of 180 fuelled by the agricultural and mining industries following contractions 2016 Corruption Perceptions Index: over successive quarters. The African 53 out of 176 (down 8) Development Bank may be key to 2016 UN Development programme increased investment in energy Human Development Index: and water infrastructure, while the 125 out of 188 (up 2) diamond and uranium markets will be ones to watch closely.

Population: 2.53 million

GNI per Capita USD10,320

PROFILE

Electricity Industry Overview

- Namibia's energy sector comprises formalized electricity, upstream oil and gas, and downstream liquid fuels subsectors, as well as the less formalized downstream gas and thermal energy subsectors. Currently, the country's energy sector is dominated by liquid fuels which accounted for some 58% of all energy consumed in 2014, while electricity as well as biomass accounted for some 20% each, with the remainder in the form of coal and liquid petroleum gas.
- Throughout the past decade, the country's total energy consumption grew by some 3% per annum, while electricity consumption has increased by an average annual rate of some 4.1%. During the last five years, the Namibian economy has grown by an average of 5.5% per annum.
- Namibia boasts one of the world's largest solar irradiation regimes, with the country receiving considerable solar radiation of up to 7KWh/m²/day of global horizontal irradiance. Moreover, Namibia has high wind power potential, especially in coastal areas where wind speeds reach 10 meters/second or faster. Furthermore, Namibia is uniquely placed to transform the challenge of an invasive plant species (encroacher bush) into an opportunity for biomass-based energy, with large bush encroached areas that have the potential to generate between 6-30MWh/ hectare from the conversion of bush into bioenergy.
- In light of the above, Namibia's renewable energy represents a valuable economic resource for Namibia. In the past, while the country has made proactive

efforts to develop this resource and develop its renewable energy industry, these initiatives have been stymied by the absence of a coherent, clearly pronounced energy policy. As such, the government of Namibia has implemented a National Renewable Energy Policy which aims to improve access to modern, clean, environmentally sustainable, and affordable energy services for all Namibian inhabitants.

Electricity laws

- Powers of the SWA Water and Electricity Corporation Act 14 of 1980 (ECA):
 - This Act makes provision for the approval of the tariffs levied and the conditions imposed by the Namibian Electricity Corporation (Pty) Ltd (now known as 'Nampower' (NamPower)) which

is a state-owned enterprise, and which is regulated by the Electricity Control Board (ECB) in respect of electricity supplied by it, and matters incidental thereto.

- Electricity Act 4 of 2007 (2007 Electricity Act):
 - This Act regulates the powers of the ECB and provides for its functions. Furthermore, it provides for the requirements and conditions for obtaining licenses for the provision of electricity and provides for the powers and obligations of relevant licensees.
- Namibia Energy Regulatory Authority Bill 2017 (Draft):
 - This Bill, currently in draft form, aims to establish a single sectoral regulator, the Namibian Energy Regulatory

Authority to regulate electricity, downstream gas, including gas pipelines and storage facilities, downstream petroleum pipelines and storage facilities, renewable energy, energy efficiency and conservation as well as to provide for the powers and functions of the Namibian Energy Regulatory Authority, structure, staffing, financial provisions and other incidental matters.

Regulators

The main electricity regulator in Namibia is:

• **The ECB:** The ECB is a statutory regulatory authority which was initially established in terms of the Electricity Act 2 of 2000, which Act was subsequently repealed by the 2007 Electricity Act, which re-established the ECB and expanded its mandate and core responsibilities. The core mandate of the ECB is to exercise control over the electricity supply industry with the main responsibility of regulating electricity generation, transmission, distribution, supply,

import to and export from Namibia through, inter alia, the issuing of licenses.

NamPower and the Regional Electricity Distributers (REDs), although strictly speaking are not electricity regulators, are key stakeholders in the electricity distribution system of Namibia. In light of the major role they play in the distribution of electricity to consumers, they could quite possibly be regarded as electricity regulators for the reasons mentioned below.

- NamPower: NamPower's core business is the generation, transmission and the trading of energy, which takes place within the Southern African Power Pool (SAPP) which is the largest multilateral energy platform on the African continent. NamPower supplies bulk electricity to Regional Electricity Distributors, Mines, Farms and Local Authorities (where Regional Electricity Providers are not operational) throughout Namibia. NamPower operates three major electricity generating facilities, being:
- Ruacana Power Station, a hydroelectric plant on the Kunene River at Ruacana at the Angolan border (240MW);
- Van Eck Thermal Plant in Windhoek, powered by coal (120MW); and
- Anixas Power Station in Walvisbay, powered by diesel (22.5MW).

Apart from the existing electricity generating facilities, NamPower is currently embarking on the Baynes Hydroelectric power plant, which is elaborated on below.

• **REDs:** The REDs are regional electricity distributing companies tasked with supplying electricity to residents in a specific region. A restructuring study completed by the Ministry of Mines and Energy (MME) in 1998 recommended that Namibia be divided into five areas and that a single electricity distributor be established for each area solely responsible for electricity distribution in that area. REDs are private companies with state-owned enterprises and other entities being its shareholders.

Generation, Distribution and Transmission

MME is the custodian of the country's energy sector. The Electricity Supply Industry (ESI) is regulated by the ECB. The ESI's main role players are the MME, ECB, NamPower, the REDs, and a handful of municipalities and mines.

The ECB sets the required license conditions and oversees the processes for the issuance of such licenses. Among others, it assesses and makes recommendations to the MME regarding the issue, transfer, amendment, renewal and cancellation of licenses, and the approval of conditions on which electricity is provided by a licensee.

NamPower, as the country's only electricity utility, encompasses three main ring-fenced businesses, namely generation, trading and transmission. NamPower also fulfils the role of system operator and trader, which

includes the important function of balancing the supply of electricity to the prevailing demand. In addition, it is the contracting party for imports, primarily from South Africa, Zimbabwe and Zambia. NamPower's transmission section is divided into two businesses, i.e. the wires and the supply business. The wires business is responsible for the transmission network. The supply business looks after transmission customers including some large mines, the REDs, Windhoek

Municipality, and some supply points that remain connected to the transmission grid for historic reasons.

The REDs are responsible for the distribution and supply of electricity to consumers within their respective areas. In June 2009, three REDs were established and made fully operational. NORED was established in 2002, and serves the country's north-central regions. Both CENORED and Erongo RED were established

in 2005, and serve the north-central and the Erongo region respectively. Two additional REDs, i.e. one for the central and one for the southern regions, may be established in future. Presently, however, local and regional authorities, and NamPower, remain the licensed distributors in the areas not covered by REDs. There is considerable debate about the establishment of the central and southern REDs.

Renewable Industry Overview

The renewable energy sector in Namibia is expanding. Several factors make Namibia an attractive location for the development of renewable energy projects (owing to its high resource potential for solar; relatively good potential for wind in many areas and low this target. population density) and as a result, this sector is poised for robust growth.

However, for investor interest to translate into significant new capacity, measures have to be put in place to help accelerate renewable energy investment, procurement, project development, and project completion. The government of Namibia has implemented a National Renewable Energy Policy which points Namibia in the right direction in terms of utilising Namibia's renewable energy resources. To date, although Namibia has an abundance of renewable energy resources, renewable energy however, only accounts for a small amount of the installed capacity. With the new National Renewable Energy Policy, the

to feed electricity they do not use back government plans for renewable energy into the grid. Net metering will greatly to contribute to more than 70% of the contribute to poverty alleviation in country's energy mix by 2030, As such, there is much opportunity for private Namibia. investors in the renewable energy WIND sector and to contribute to achieving The NAD180 million wind power

SOLAR

project at Lüderitz is nearing its completion which will be Namibia's Namibia's abundance of solar resources first-ever wind farm. The wind farm is being built by Innosun Energy and the increasing affordability of solar technologies make the implementation Holdings, which will add 5MW of electricity to the national power grid. of solar technologies a high priority in the country. The Namibian government Innosun is a Namibia-registered and the private sector have contributed company owned by Namibian and to large-scale solar farming projects, French investors. Innosun is currently planning on building a second 5MW which include recent solar power solar park at Aussenkehr, on the plants being installed in Otjiwarongo, Keetmanshoop, Omaruru and Arandis. banks of the Orange River, as well as Also, various rooftop solar installations a third wind farm to supply Namdeb exist which were developed after the Diamond Corporation (Pty) Ltd with electricity. Wind power is getting net metering system was implemented. Namibia recently developed net cheaper and more efficient through metering rules for the REDs. Net new technologies being discovered, making it a very logical solution for the metering allows residential and commercial customers who generate Namibian energy market. their own electricity from solar power

HYDROELECTRICITY

Hydropower needs specific mention as a renewable source of energy. The Baynes Hydropower station (which is soon to be completed) is a very valuable generation asset that has the potential of supplying Namibia and Angola with reliable, clean electricity for generations to come. It is envisaged that the Baynes mid-merit/peaking power station's capacity would be 600MW which will be shared equally by Namibia and Angola. Like the Ruacana Power Station, the new dam will function as a mid-merit peaking station, so that NamPower can avoid buying imported power during peak hours.

GEOTHERMAL

Namibia has a number of hot springs across the country indicating availability of geothermal resources, which could potentially be used for electricity generation, process heat, or other applications. There has been very little development of these resources to date and limited data is available on this

resource's potential. While Namibia has a high abundance of other renewable alternatives that are currently more commercially viable such as solar and wind, the Renewable Energy Policy still supports the inclusion of geothermal energy.

BIOMASS

Namibia is endowed with abundant biomass in the form of "encroacher bush." Approximately 30% of Namibia is covered by encroacher bush. The energy content of this resource has been estimated to be 1,000TWh.vi. Forests in Namibia also constitute a predominant source of biomass for energy. Using biomass for energy cuts back on greenhouse gas emissions. NamPower has performed an assessment of several commercially available technologies to determine the most suitable scenario for generating electrical power from encroacher bush in Namibia.

Government Incentive Schemes

The MME has a renewable energy division which is tasked with the implementation of Renewable Energy and Energy Efficiency programmes. The key functions of the division are:

- conducting research on Renewable Energy resources in Namibia;
- public awareness campaigns on Renewable Energy and Energy Efficiency;
- implementation of the Off-Grid Energisation Master Plan (OGEMP); and
- offer subsidized loans to rural and urban clients to procure solar energy technologies.

One of the key functions of the division is the implementation of the OGEMP. The OGEMP is a 20-year program aiming to provide access to appropriate energy technologies to communities living in off-grid areas, through:

- solar electrification of public institutions;
- establishing of Energy Shops; and
- credit financing of solar technologies.

Another national programme of the division is the promotion of Renewable Energy and Energy Efficiency:

• to create a culture of energy consciousness;

- to improve framework conditions for Renewable Energy and Energy Efficiency technologies; and
- to create dialogue platforms for advancement of Renewable Energy and Energy Efficiency.

A number of NGOs also exist to promote the development of renewables in Nambia:

 Renewable Energy Industry Association of Namibia. Founded on May 19, 2008, its objective is defined as giving emphasis to industry representation, promoting renewable-energy, ensuring adherance to quality standards, lobbying for renewable energy issues; and establishing professional relationships with national and international bodies with similar objectives; and

• Renewable Energy and Energy Efficiency Institute (REEEI). REEEI was established in 2006 following a collaboration agreement with the Polytechnic of Namibia. The mandate of REEEI is to address barriers that hinder the entry of Renewable Energy and Energy Efficiency. In 2014 this institution was transformed into the Namibia Energy Institute (NEI) to include the other energy sectors.
Major Projects/Companies



According to the MME, the major players in the energy industry in Namibia are:

- NORED. Incorporated in 2001, northern Namibia's regional Electricity Distributor, NORED, has put itself on the world map as a reliable energy supplier. In 2016/2017, NORED delivered electrification programs to the Kavango, Zambezi, Omusati, Oshana, Kunene and Ohangwena Region:
 - CENORED is the third licensed regional electricity distribution company to be established in Namibia. Its license area covers the Otjozondjupa and Kunene regions and has a customer base of 40,000 customers and distributes electricity to various towns and settlement areas of

central-northern Namibia over an area of approximately 120 000 km².

- Ellis Shilengudwa Inc. has been involved in a number of major projects in Namibia, including:
 - Omburu Power Project (5MW) which is the first operational photovoltaic solar plant in Namibia; and
 - other solar projects also include the, Osona Power Project, Outapi Power Project (4.9MW), Ombepo Wind Power Project (5MW) and the Arandis Power Project (3.8MW) as well as the Ohorongo Solar Plant (5MW) and the 5.4MWp (DC) Solar Project in Okatope.

Foreign Investment/Ownership



Foreign investment in Namibia is governed by the Foreign Investments Act 9 of 1990 (Foreign Investments Act).

According to the Foreign Investments Act, no foreign national engaged in a business activity or intending to commence a business activity in Namibia shall be required to provide for the participation of the government or any Namibian as shareholder or as partner in such business, or for the transfer of such business to the government or any Namibian: provided that it may be a condition of any license or other authorisation to or any agreement with a foreign national for the grant of rights over natural resources that the government shall be entitled to or may The Minister may, however, by acquire an interest in any enterprise to notice in the Gazette, specify any

business or category of business which, in the minister's opinion, is engaged primarily in the provision of services or the production of goods which can be provided or produced adequately by Namibians, and, with effect from the date of such notice, no foreign national shall, subject to the provisions of section 7(3) of the Foreign Investments Act, through the investment of foreign assets, become engaged in or be permitted to become engaged in any business so specified or falling within any category of business so specified.

be formed for the exploitation of such rights. Subject to compliance with any formalities or requirements prescribed by any law in relation to the relevant business activity, a foreign national may invest and engage in any business activity in Namibia which any Namibian may undertake. For the purposes of any law governing the establishment and carrying on of any business activity or the taxation of any income, or any other aspect, of any business activity, a foreign

national shall be in no different position than any Namibian, except as may be otherwise provided by the Foreign Investments Act.

New legislation, to wit, the Namibia Investments Promotion Act 9 of 2016, set to repeal the Foreign Investments Act has been promulgated, however has not taken effect yet.

This new legislation does not make provision for local ownership, it does however grant the Minister a vast number of powers and functions which includes the approval of an investment proposal by a foreign investor, provided that they are satisfied that the conditions set out in Section 14 of the said Act have been met and a substantial number of the requirements set out in Section 4(2) (b) of the Act are fulfilled or likely to be fulfilled in a specified period. These requirements include:

- joint venture with Namibians;
- the employment creation for Namibians;
- the contribution of the investment to the advancement of persons

who have been socially, economically or educationally disadvantaged by past discriminatory laws and practices;

- the contribution of the investment to the implementation of programmes and policies aimed at redressing social and economic imbalances in Namibia, including gender-based imbalances;
- the transfer of technology and technological skills;
- the development of managerial skills;
- the promotion of research, development and innovation;

- the value addition to the natural resources and manufacturing sector and procurement of goods and services;
- the environmental impact and contribution to environmental benefits; and
- other matters relating to the improvement of the economy and development benefits in the public interest as the Minister may prescribe.

Further, in terms of the proposed NEEEF Bill, the NEEEF will promote transformation through six empowerment pillars (of which three are mandatory and are subject to scoring). The three mandatory pillars are:

- Employment Equity.

1. Local Ownership. or educational imbalances arising out of racially discriminatory laws or 2. Management Control and practices before the Independence of Namibia. 3. Human Resources and Skills However, the NEEEF is still in draft development. form and it is uncertain whether and The local ownership pillar dictates that in what form this bill will be passed. any private sector enterprise that is established after the commencement of NEEEF may commence business only when such enterprise has secured 25% ownership by a racially disadvantaged person or persons or such higher percentage as may be determined by the minister through notice in the government Gazette. Racially disadvantaged persons are identified as all persons who belong to a racial or ethnic group which was or is, directly or indirectly, disadvantaged as a consequence of social, economic,

UNFCCC – Paris Commitments and beyond



Namibia ratified the Paris Agreement in September 2016. The country's Intended Nationally Determined Contribution contained a commitment to reduce emissions by 89% (relative to a business as usual baseline) by 2030. Namibia has identified the need to attract additional investment to the tune of some USD33 billion (at 2015 prices) to enable it to meet this commitment.

Relevant Resources and References



Sources

MME's official website: <u>http://www.mme.gov.na/directorates/energy/renewable/</u>

NamPower's official website: <u>https://www.nampower.com.na/</u>

Prefeasibility study for biomass power plant in Namibia <u>http://www.the-eis.com/</u> <u>data/literature/Final_Executive%20Summary_NamPower%20EBtP%20Study.pdf</u>

The Electricity Control Boards official website https://www.ecb.org.na/

The National Renewable Energy Policy of 2017

Intended Nationally Determined Contributions (INDC) of The Republic of Namibia to the United Nations Framework Convention on Climate Change, September 2015







Nigeria

Overview

KEY FACTS

Jurisdiction: The Constitution of the Federal Republic of Nigeria, Federal Statutes, State laws, Case Law (Judicial Precedent), supplemented by common law and equity, customary law and Islamic law.

Language(s): English (official language), Hausa, Igbo and Yoruba and several others.

BUSINESS ENVIRONMENT

2019 Doing Business Report: 146 of 190 (down 1 ranking)

2018 Global Competitiveness Ind 115 of 140 (down 3 rankings)

2019 Index of Economic Freedor 111 of 180 (up 1 ranking)

2018 Corruption Perceptions Inc 144 of 180 (no movement)

2018 UN Development ProgramHuman Development Index:157 of 189 (no movement)

Population: 190.9 million

GNI per capita: USD2,080

PROFILE

| | With a population of approximately | |
|------|------------------------------------|--|
| | 190 million, Nigeria accounts | |
| | for about 50% of West Africa's | |
| dex: | population. Nigeria's real GDP is | |
| | expected to grow by about 2.3% in | |
| | 2019 and 2.4% in 2020, based on | |
| m: | the accelerated implementation | |
| | of economic recovery and growth | |
| | plans. Although the private sector | |
| dex: | is the main driver of the economy, | |
| | its potential has not been fully | |
| | exploited as it faces significant | |
| nme | challenges – including power | |
| | shortages and under-investment | |
| | in infrastructure. | |

Electricity Industry Overview



Nigeria's total installed electricity generation capacity is estimated to be 12,522MW, whilst current available capacity is circa 6,800MW. Nigeria achieved its highest peak generation output of 5,222.3MW in December 2017. As of March 2019, the installed electricity generation capacity from thermal sources stood at approximately 81% with the remaining 19% being hydrogenerated. The annual consumption of electricity per capita is estimated at less than 150kWh (compared to an average in Sub-Saharan Africa of 552kWh per capita and a world average of 2,975kWh per capita).

The Electric Power Sector Reform Act 2005 (EPSRA) assisted with the liberalization of the energy market by creating a framework for unbundling of the state-owned power entity

1,125MW of solar power to the grid. into generation, transmission and distribution companies, as well as Though disagreements relating to the the transfer of assets, liabilities and solar feed-in tariff have stalled signing staff of the National Electricity Power of the Put Call Option Agreements by Authority (NEPA) to the Power Holding 12 of the 14 project developers, the Company of Nigeria (PHCN) and to signing of the PPAs is a clear indication of the government's intention to tap successor generation, transmission into the renewable energy potential of and distribution companies. In addition, the Nigeria Bulk Electricity the country. Trading Co Plc NBET was incorporated to serve as a bulk trading entity in the electricity market.

The government of Nigeria is determined to ensure that the country's power sector is more fully diversified and not dependent on any single energy source. To this end, the NBET, Federal Ministry of Power, Works and Housing and 14 project developers, in July 2016, signed USD1.76 billion power purchase agreements (PPAs) to generate

Electricity Laws

- EPSRA is the primary energy legislation and ancillary regulations are made from time to time by the Nigerian Electricity Regulatory Commission (NERC). The ESPRA is the main statutory legislation aimed at regulating the electricity sector in Nigeria. It contains guidelines for the licensing and regulation of all parts of the electricity value chain in Nigeria (the generation, transmission, distribution and supply of electricity). It also establishes the NERC to monitor the sector and enforce regulations. (See below)
- The Nigerian Electricity Management Services Authority Act 2014 (NEMSA). This Act establishes NEMSA to carry out the functions of enforcement of technical standards and regulations and certification of all categories of electrical installations to ensure the efficient production and delivery of safe and sustainable electricity. (See below)
- The Nigerian Electricity Regulatory Commission (Permits for Captive Power) Regulations 2008. The regulation defines

captive power generation as generation of electricity exceeding 1MW for the purpose of consumption by the generator, and which is consumed by the generator itself, and not sold to a third party. Its provisions empower industrial customers to generate the power needed for their operations and eliminate technical losses as the power produced is consumed directly by the generator. (See below)

Application for Licenses (Generation, suspension of a license by NERC.

The Nigerian Electricity Regulatory Commission Transmission, System Operations, Distribution and Trading) Regulations 2010. This regulation outlines the manner, requirements and fees for application for generation, transmission, distribution and trading licenses from NERC. It also states the criteria for renewal or



Regulators

The NERC is the main regulator created by the EPSRA. The NERC is authorized to issue regulations, guidelines and set tariffs for electricity supply in Nigeria through a tariff order, which consists of various methodologies (currently the NERC uses the Multi-Year Tariff Order). The NERC undertakes economic regulation of the Nigerian electricity supply industry and serves the purpose of maintaining a supervisory role over the privately run business entities operating within the sector. It also has the mandate to license operators, determine operating codes and standards, establish customer rights and obligations and set cost-reflective industry tariffs.

The Nigeria Electricity Management Services Authority enforces technical standards and regulations, technical

inspections, testing and certification of under a management contract) and all categories of electrical installations, the Hydro Generation plants Kainji, electrical meters and instruments jebba and Shiroro (which were the subject of separate concessions to etc. to ensure the efficient production and delivery of safe, reliable and private investors). The management sustainable electricity power supply. contract with Manitoba Hydro International Nigeria Limited (MHINL) Generation, Distribution expired in 2017 and management and Transmission has since been handed over to a local As mentioned above, in 2005, the internal team of the TCN.

NEPA, was transferred to the PHCN. This was further unbundled into At present, there are 23 gridconnected generating plants in 11 distribution companies (Discos), six generation companies, and one operation and this comprises of the privatized generating companies, transmission company, and the Independent Power Producers and assets, liabilities and staff of PHCN the generating stations under the were transferred to the successor National Integrated Power Project. companies. The Nigerian government has divested its majority interest in the successor companies by divesting 60% The TCN is presently fully owned and operated by the government and its of its interests in these entities (save operations cover the whole country. for the Transmission Company) (TCN) (which was not privatized but was put

TCN's core mandate broadly covers the operation and management of high voltage (330/132kV) transmission system assets, generation dispatch functions (system operations) and provision of open access transmission services on regulated tariffs.

The Discos control the supply of electricity within a designated geographical area. Before May 15, 2017, generation companies could not sell directly to end users; however, with the advent of the Eligible Customers' Regime (implemented by the NERC Eligible Customer Regulations 2017), generating companies are now free to generate and sell electricity directly to end users. (See below)

Renewable Energy Overview



Nigeria is endowed with vast and varied natural resources, including massive supplies of water, solar, wind and biomass. This vast potential in renewable energy resources is mostly untapped, hence the government of Nigeria has developed and committed to several plans and programs aimed at ensuring the development and growth of Powershare Group of Companies, in a renewable energy.

The Nigerian Renewable Energy and Energy Efficiency Policy (NREEEP), approved in April 2015 by the Federal Executive Council, commits Nigeria to achieving 20% of its national electricity supplies from renewable energy sources by 2030. In addition, the NERC has committed to stimulating investment in renewable energy generation in Nigeria and has set a target of a minimum of 2,000MW of electricity generation from renewables by 2020. The Federal Ministry of Environment has also initiated a Renewable Energy Programme (REP) with the objective of addressing the nation's challenge of moving towards clean, reliable and sustainable energy

supply. The REP successfully embarked at encouraging private companies to on Rural Electrification, providing and invest in solar home systems for off-grid installing Stand Alone Solar Systems for communities. The REA also provides solar 600 households as well as training in home system companies with access to the rural electrification fund with Mutum Biu, Gassol, Taraba state. the expectation that access to cheaper In addition, the REP successfully financing will result in cost saving which attracted investment, from the Synergent will be transferred to the end user in the form of affordable rates.

50MW solar farm in Kaduna which was Biomass is also gaining a lot of officially launched by the Minister of Environment and Kaduna State Governor interest and attention. This interest in September 2011. is largely from the government through the REP. For example, working in conjunction with Carbon Quest and Adamawa state, the REP office is establishing an integrated Rice Processing and Power Generating Facilitator that intends to use self-generated power from rice-husk.

In terms of existing generation capacity, hydropower is the main source of renewable energy in Nigeria. Solar energy is mainly used in urban and rural areas for street lighting, domestic home use, and in some rural areas for irrigation projects and to power water pumps. The government encourages the provision of electricity to off-grid The Renewable Energy Master Plan areas of Nigeria by means of solar (REMP) was developed by the Energy Commission of Nigeria, in collaboration power. This is done through the Rural with the United Nations Development Electrification Agency (REA) which Programme in 2005 and was reviewed was inaugurated in 2006. The REA provides policy and regulation aimed

in 2012. It sets out a road map for increasing the role of renewable energy in achieving sustainable development.

The REMP stresses the need for the integration of renewables in buildings, electricity grids and for off-grid electrical systems. According to the REMP, Nigeria intends to increase the supply of renewable electricity to 23% in 2025 and 36% by 2030, Renewable electricity would then account for 10% of Nigeria's total energy consumption by 2025. The Minister of Power, Works and Housing recently revealed the Road Map for Steady, Incremental and Uninterrupted Power Supply. It confirms the drive to increase generation capacity by the use of energy sources including solar, wind, hydro and coal.

THERMAL

The Nigerian government has developed ten thermal generation plants under the National Integrated Power Project which are currently held by the Niger Delta Power Holding Company Limited. The largest of these plants are the

Alaoji Power Station (1,074MW), Olorunsogo II Power Station (675MW), and the Calabar Power Station (561MW). The Alaoji and Olorunsogo II Power Stations operate on combined cycle gas turbines. There are no biomass power projects underway in Nigeria. There are also private sector led projects which are adding to the power generation capacity, the Afam Thermal Power Plant in Port Harcourt is expected to generate and deliver 340MW to the National grid when it comes on stream. The Dangote group have also invested in a Qua Iboe IPP which is proposed to generate 540MW by 2021. The Azura-Edo power project has been regarded as a landmark achievement in the power sector as Nigeria's first project-financed IPP.

The power project with a generation capacity of 459MW is the first Nigerian power project to benefit from a Partial Risk Guarantee from the World Bank.

SOLAR

There is huge potential for solar power in Nigeria, with analysts projecting that Nigeria could generate over 50% of required power by deploying solar PV panels on just 1% of Nigeria's land mass (estimated at 923,970 km²).

There are opportunities for solar power developers to partner with distribution companies to provide embedded power generation, particularly for the distribution companies in northern Nigeria. The northern part of Nigeria has the highest potential for solar projects given the high level of solar radiation (about 5.0-7.0kWh/m²/day). Utilizing solar power generation in the northern part of the country has the potential to steadily increase the power generation capacity in Nigeria. There is a ready market for solar power developers to operate in due to: the huge demand for power supply; high population density; and the fact that solar power projects take less time to reach commercial operations compared to the conventional gas-fired generation.

In 2016, NBET signed power purchase agreements with 14 firms for the construction of solar power plants in eight states in Nigeria that will generate 1,125MW of electricity. It is understood that the generated electricity will be fed first to the distribution companies where the solar plants are sited and the excess fed to the national grid. As part of the project, it is understood that a 100MW plant is planned for Bauchi state and a 50MW plant in Nasarawa state.

Other off-grid projects include:

- University of Ibadan (10MW) provides renewable electricity to the university community and its environs. This project serves as a pilot project with additional projects being proposed for other universities in Nigeria. The Project was being carried out in partnership with the German government and became operational in October 2016.
- Greenwish Partners proposed 200MW solar power plants in three states in Nigeria by Greenwish

Partners, a French independent power producer. Greenwish will invest USD280 million to build solar power plants in Nigeria that are expected to start producing electricity in the first quarter of 2018. A plant in the south eastern state of Enugu will produce 100MW, and the other two plants will be 50MW each and located in the northern Kaduna and Jigawa states. There is however no publicly available information as to the status of the project.

WIND

Presently, there are no operational wind power plants in Nigeria. However, Vergnet Groupe and the Federal Ministry of Power have completed the construction of a 10MW wind power plant in Katsina state and this plant is expected to be commissioned in 2018. In addition, the NBET is in negotiations with JBS Wind Power Limited for the construction of a 100MW wind power farm in Plateau state and a provisional Independent Power Producer license has been issued to JBS Wind power Limited

by NERC, acknowledging that JBS Wind Power Limited has met all regulatory requirements to commence operation.

The Nigerian continental shelf is about 42,285 km and this represents a huge potential for the development of offshore wind farms. There is particularly huge potential for wind energy development in the north of Nigeria as wind speed is highest in Sokoto, Jos, Bauchi and Kebbi states.

HYDROPOWER

There are currently three hydropower generation stations in Nigeria - Kainji, Jebba and Shiroro power stations. These power stations account for about 26% of all electricity produced in Nigeria. The country is reasonably endowed with large rivers and some natural falls, hence, there are opportunities for small and large hydro projects. Small hydropower is defined in the REMP as all hydroelectricity schemes below 30MW.

In a bid to tap into the potential for more hydropower plants, the Federal Executive Council, in August 2017, approved

USD5.792 billion for the construction of the 3,050MW Mambilla Hydro-Power project at Gembu in Taraba. The contract was awarded to a consortium of three Chinese companies, China Gezhouba Group Corporation, Sinohydro Corporation Limited and CGCOC Group Co. Limited, for the engineering and turn-key contract, including civil and electro-mechanical works. The scope of work of the project will include the construction of four dams and 700 km of transmission lines.

Furthermore, on May 15, 2019, the Federal Executive Council approved a USD1 billion loan from the Chinese EXIM Bank for the 30MW Gurara II hydropower project. This followed the conclusion of the concession process whereby North South Power Company was chosen as the concessionaire for the hydropower components of the Gurara dam. Upon conclusion of the hydropower project, the Gurara dam will produce an estimated 115GW per hour of energy annually.













Another noteworthy development in renewable energy financing in Nigeria is the recently consummated debt financing deal that saw North South Power Company Limited, the operators of the Shiroro Hydro-electric power station, raise over NGN8.50 billion from a green infrastructure bond. This is the first certified green corporate bond and the longest tenured (15 years) corporate bond issued in the Nigeria debt capital markets. The funds raised from the capital market will be used to finance the capital expenditure of North South Power Company Limited whose business model is designed to encompass a broad range of technologies and power types including hydropower, wind, biomass and solar.

Current Issues in the Renewables Industry

Despite Nigeria's vast and varied renewable energy potential, the renewable energy sector remains underdeveloped and untapped because prospective investors still have to grapple with the following challenges:

- Lack of Earmarked Funding for NBET: NBET was created as part of the PHCN privatization but is not funded through FGN's budget. Securing funding for NBET and credit support for its obligations remain an issue to be addressed through various structures (including partial risk guarantees).
- Bilateral Arrangements: To date, the Nigerian authorities have primarily relied upon bilateral approaches from investors rather than competitive tenders. This has in turn fuelled uncertainty regarding the appropriate level of tariff. One reason that projects currently under development have experienced delays relates to prolonged discussions about tariff levels.
- Naira Denominated Tariffs: NBET prefers to denominate PPA tariffs in Naira, whilst most IPPs rely upon USD financing to purchase

equipment. Naira volatility has exacerbated this problem as described more fully below.

• Unresolved Liquidity issues in the Sector: There is a revenue shortfall which has caused liquidity issues throughout the value chain of the power sector and which has remained unresolved. The liquidity issues are caused by several factors including but not limited to the lack of a cost-reflective tariff adjusted appropriately for inputs such as inflation, available generation capacity, foreign exchange rate fluctuation, etc. In addition the devaluation in the naira has deepened this liquidity crisis further as the foreign exchange differential is till yet to be reflected in the tariff. Another result of the devaluation is the effect it has had on the ability of investors to meet their debt service obligations as a majority of the financing for the power sector is USD-denominated

financing, widening the gap as tariff payments are in naira. For the generation companies, feedstock gas which is priced in USD yet they are unable to get full payment for their invoices from NBET, who is unable to recover full value of their invoices from the distribution companies. The distribution companies also have a claim that the legacy debts owed to each of their distribution companies has yet to be paid by the federal government and was an obligation agreed to during the privatization.

Renewables Laws

- EPSRA encourages the promotion of electricity from all sources of energy including renewables.
- Regulations on Feed-In Tariff for Renewable Energy sourced electricity in Nigeria, 2015.
- The regulation aims to boost power supply in the country and stimulate

private sector participation in power generation from renewable energy technologies. According to Section 5 of the regulation, the Nigerian Bulk Electricity Trading Company shall purchase 50% of the renewable energy electricity capacity limit established by the regulation, while electricity distribution companies shall take up the remaining 50% of the capacity. (See below)

Government Incentive Schemes



Power Production Tax Credit for electricity generation companies is aimed at incentivizing the adoption of renewable energy. The government has committed to ensuring that renewable energy becomes more widespread by approving the following tax incentives:

- five-year tax holidays to manufacturers from date of commencement of manufacturing; and
- five-year tax holidays on dividend incomes from investment into renewable energy sources.

There are also incentives for importers to import energy efficient appliances and lighting through exemption from excise duty, sales tax and customs duty for two years on the importation of renewable energy equipment and materials.

Finance, Grants and Loans

The NREEEP commits to providing access to finance lines for renewable energy projects as well as generation, distribution and transmission infrastructure, including for grid extension, and more importantly for off-grid, minigrid and feed-in systems, all based on renewable energy. Through the NREEEP, the government also commits to providing assistance in allocating or granting of land for renewable energy projects; as well as providing soft loans and special low interest loans from a Power Sector Development Fund to renewable energy projects.

Feed-in and Licensing Incentives

In pursuance of the NREEEP, the government has declared a commitment to ensuring that the NBET, distribution companies or any other identified off-takers are encouraged to buy the electricity offered to the electricity market from renewable energy sources. However, this will be done at a rate fixed by the NERC. In addition to this offtake guarantee, the government has committed to a "simplified licensing yell as procedure" for IPPs selling electricity from renewables to the grid (up to 50MW).

Major Projects/Companies



Existing Hydro Power Stations

- Kainji and Jebba Power Plants (1,338.4MW) – these plants have an installed capacity of 1,338.4MW and compose 20% of Nigeria's power generation. The concessionaire, Mainstream Energy Solutions Limited, is, as a result, Nigeria's largest generator of renewable clean energy.
- Shiroro Power Plant (600MW) -Shiroro Hydro Electric Plc (a subsidiary of North South Power Company Limited) is the concessionaire and operator of the Shiroro power plant.

Proposed Hydro Power **Stations**

- Mambilla Power Plant (proposed **3,050MW)** – a joint venture of Chinese Civil and Engineering Companies was awarded the engineering and turn-key contract, including civil and electro-mechanical works for USD5.792 billion. The project will be jointly financed by the Federal Government of Nigeria (15%) and the China Export Import, EXIM, Bank (85%).
- Zungeru Power Plant (proposed **700MW)** – the project is located in Niger state, Nigeria and comprises four units of 175MW each. It is understood that the project is

- circa 47% complete, with the first phase to be completed in December 2019.
- Kiri Power Plant (proposed **35MW)** – construction of this site is proposed on the Kiri Dam in Guyuk local government area of Adamawa state in the north east of Nigeria, damming the Gongola River.
- Gurara Hydropower Plant: (proposed 30MW) – located in Kaduna state, the 30MW project is estimated to cost USD18.4 million and it is expected to address the gap in electricity supply across the country, particularly in the North-West states of Nigeria.
- Kashimbila Hydropower Plant (40MW) – construction of this hydropower plant located in Taraba state has been completed; however, the transmission infrastructure required for grid connection is pending. In addition, the process of appointing a concessionaire is ongoing.

Foreign Investment/Ownership



The Nigerian energy sector is open to foreign participation. Foreign companies are required to incorporate a separate entity in Nigeria (Companies and Allied Matters Act 1990). This separate entity may be fully owned by foreign investors. In certain sectors, i.e. the oil and gas sector, companies with Nigerian ownership (51%) are given preferential bond markets. treatment and consideration in the award of contracts, but this does not apply to electricity generation. Foreign investors must also register with the Nigerian Investment Promotion Commission.

Furthermore, foreign investors may invest in Nigeria by way of foreign direct investment. i.e. investment in e.g. ownership of productive assets, i.e. factories, mines and land, either by setting up businesses or through foreign portfolio investment, which is where foreign investors make purchases in the country's stock and

UNFCCC – Paris Commitments and beyond



Obligations

- Nigeria signed the United Nations Framework Convention on Climate Change (UNFCCC) in 1994. Nigeria signed the Paris Agreement (an agreement within the UNFCCC) on September 22, 2016, and subsequently ratified the Agreement on May 16, 2017. It was the 146th country to endorse the Agreement.
- In accordance with Article 2 of the Paris Agreement, Nigeria has obligations to:
 - hold the increased global average temperature to well below 2°C above pre-industrial levels;

- increase the adaptability to the adverse impacts of climate change and foster climate resilience and low greenhouse gas emissions in a manner that does not threaten food production; and
- make finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development.

Nigeria has set itself the goal of reducing its carbon emissions by 20% unconditionally and 45% with international support by 2030 through energy, transport and agriculture projects that would reduce carbon emissions and mitigate the effects of climate change.

Steps taken under Paris Agreement

The Nigerian government has introduced Green Bonds. These bonds enable capital-raising and investment for new and existing projects with environmental benefits. The bond is a fixed-income security issued to finance projects that have a positive impact on the environment, and will fund a range of renewable energy, afforestation, and environmental projects. Nigeria is the first African nation to issue a sovereign nation to issue a sovereign green bond, and is the fourth nation in the world to issue one. In 2017, Nigeria issued NGN10.69 billion (USD29 million) bonds over three projects. The bond's tenor is five years and investors receive an annual coupon at 13.48%. Following increased calls for climate funding,

Nigeria's Ministry of Environment has planned to issue NGN150 billion green bonds to the public.

Relevant Resources and References



References

Electric Power Sector Reform Act 2005 accessed at: http://www.nercng.org/index.php/library/documents/Regulations/Electric-Power-Sector-Reform-Act-(EPSR)-2005/

NERC Eligible Customer Regulations 2017 accessed at: http://www.nercng.org/index.php/library/documents/Regulations/NERC-Eligible-Customer-Regulation-2017/

Nigerian Electricity Regulatory Commission Application for Licences (Generation, Transmission, System Operations, Distribution and Trading) Regulations, 2010 accessed at: http://www.nercng.org/nercdocs/Regulation-for-the-Application-for-Licence.pdf

Nigerian Electricity Regulatory Commission (Permits for Captive Power) Regulations 2008 accessed at: http://www.nercng.org/nercdocs/Regulation-for-Captive-Power-Generation.pdf

Regulations on Feed-In Tariff for Renewable Energy sourced electricity in Nigeria, 2015 accessed at: https://www.iea.org/media/pams/nigeria/NIGERIA_FIT_regulation2015enteringintoforceFeb2016.pdf

The Nigerian Electricity Management Services Authority Act 2014 accessed at: http://www.nemsa.gov.ng/site/wp-content/uploads/2017/08/NEMSA_ACT_2015.pdf





Senegal

Overview

KEY FACTS

Jurisdiction: Senegal is a civil law jurisdiction. The Fourth Constitution of Senegal was adopted in 2001 and amended in 2016 and 2019.

Language(s): French is the official language of Senegal but the most-spoken is Wolof.

BUSINESS ENVIRONMENT

2018 Doing Business Report: 140 of 190 (up 7 rankings)

2018 Global Competitiveness Inc 106 of 138 (up 6 rankings)

2017 Index of Economic Freedor 120 of 180 (down 9 rankings)

2016 Corruption Perceptions Inde 64 of 176 (down 3 rankings)

2016 UN Development Programmer Human Development Index: 162 of 188 (up 8 rankings)

Population: 15.8 million

GNI per capita: USD2,480

PROFILE

| | Located in West Africa, Senegal is | | |
|------|--------------------------------------|--|--|
| | bordered by Gambia, Guinea, Mali, | | |
| | and Mauritania. It has been one of | | |
| dex: | the most stable countries in Africa, | | |
| | and is a member of the Economic | | |
| | Community of West African states. | | |
| m: | Economic growth in Senegal has | | |
| | recently accelerated, reaching about | | |
| | 6.5% in the past two years, making | | |
| dex: | Senegal one of the best performing | | |
| | economies in Sub-Saharan Africa. | | |
| | Almost three-quarters of this | | |
| me | recent growth is due to a higher | | |
| | contribution from exports, whose | | |
| | volumes increased by almost 15% and | | |
| | 13% in 2015 and 2016 respectively, | | |
| | underpinned by a more diversified | | |
| | base in agriculture, fishing, and | | |
| | mining. | | |

Electricity Industry Overview



- Senegal's electricity market is statecontrolled, with the generation, distribution and transmission of power performed by the state-owned national company Senelec.
- As at March 2018, the installed capacity was 864MW comprising:
 - Thermal: 733MW
 - Hydro: 60MW
 - Solar: 50MW¹
- The state of Senegal has defined a development plan for the 2013-2017 generation fleet based on an energy mix policy involving coal, natural gas, hydroelectricity and renewable

energies. In 2014 Senegal's electricity production mix was dominated by oil, coal and gas sources, which made up approximately 88% of the total, while around 9% came from hydroelectric generation, and the remaining 3% from other sources.

• As of 2014, according to World Bank statistics, approximately 61% of the population of Senegal had access to electricity. This constitutes approximately 85% of the urban population, but only 33% of the rural population.

Electricity Laws

The major renewable energy governing laws are the following:

- Act No. 2010-21 of December 20, 2010 on the framework law on renewable energy.
- Act No. 81-22 of June 25, 1981 establishing tax advantages in the field of the use of solar and wind energy.
- Decree No. 2011-2013 implementing the renewable energy orientation Act relative to conditions of purchase and pricing of the electricity produced by power plants from renewable energy sources, and the conditions of their connection to the grid.

- for self-consumption.
- Ministerial order No. 29/MEMI of

Decree No. 2011-2013 implementing the renewable energy orientation Act relative to the conditions of purchase and payment of the surplus of renewable energy generated

April 21, 1999, establishing a Quality Control Unit for photovoltaic components.





Regulators

The main regulators of the energy sector in Senegal are:

- Of Petroleum and Energies;
- The Electricity Sector Regulatory Commission (its deals with the electricity segment), which is an independent authority responsible for regulating the production, transmission, distribution and sale of electricity; and
- The National Committee for Hydrocarbons, created by Act No. 98-31 of April 14, 1998 on import, refining, storage, transport and

distribution of hydrocarbon, is a consultative organ which deals sector.

The Minister of Energy develops and proposes general policy and standards for the electricity sector to the President of the Republic. The Minister also grants licenses and concessions provided by the Energy Act, and has the power to remove them. The Electricity Commission has a number of main responsibilities which include advisory functions and decisionmaking powers. In its advisory

functions, it contributes to the development of national strategies with the oil and gas segment of the related to the electricity sector:

- advising the Minister of Energy on all legislative and regulatory plans for the electricity sector; and
- offering to the Minister of Energy orders related in particular to the rights and obligations of companies, thirdparty access to the network and business relationships with their customers.

- The Commission also has powers to take individual decisions in the energy sector. Its role is to:
 - examine applications for a license or concession;
 - ensure compliance with the terms of the licenses and concessions;
 - make changes to general licenses, concessions or their specifications;
 - ensure compliance with technical standards;

- ensure compliance with competition in the sector;
- determine the structure and composition of tariffs
- apply, if necessary, sanctions to operators for breaches of duty; and
- it also has broad investigatory powers in the sector.





Generation, Distribution and Transmission

Generation, distribution and transmission of power is performed by Senelec (the state-owned national company in charge of generation, distribution and transmission of power).

The interconnected grid represents the bulk of the Senelec network with more than 90% of the installed capacity in 2012. This network is mainly concentrated in the western and northwestern parts of the country and is used to supply the largest cities, mainly Dakar, Thies, Louga, Diourbel, St. Louis, Matam, Kaolack and Fatick, The Interconnected Grid production fleet is currently composed of Senelec facilities in Dakar, Kahone 1, Kahone 2, Saint-Louis, independent

generation plants and the Manantali hydroelectric plant for a total installed capacity of 634.56MW. The Non-Interconnected Network includes the regional plants of Tambacounda and Boutoute (Ziguinchor) and nearly 26 isolated centers distributed between the regions of Kaolack, Tambacounda, Kolda and Ziguinchor. The RNI has an installed capacity of 42.5MW fully thermal and represents only 6% of the total installed power at the country level.

• Generation: provided by Senelec power plants, independent distributors authorized outside Senelec concessions (mainly in rural areas) and IPPs. Senelec owns approximately half the generation

capacity with the remainder owned by IPPs. In 2016 there was 70MW of solar and 125MW of coal projects in construction by IPPs. Distribution and sales: senelec

is the concessionaire for the transmission and distribution network in Senegal (with the exception of Manantali interconnection) and operates in a monopoly condition for the purchase and sale of wholesale power.

Renewable Energy Overview



Government policy has set the objective of achieving a non-biomass commercial energy independence rate of at least 15% by 2025, due to the contribution of renewable energies and biofuels.

The government's Letter on the Energy Sector Development Policy (adopted in October 2012) also contains a target of having 15% of primary energy produced from renewable sources (excluding biomass) by 2025. This figure would correspond to having more than 25% of the projected electricity mix being of renewable origin in 2025. Given the expected doubling of fossil energy capacity, the country is therefore strongly committed to the development of renewable energies.

In this context, the country has launched several tendering programs in renewable energies. The national electricity company, Senelec, offers 20-year guaranteed PPAs.

SOLAR the project developer Senergy PV SA As one of the sunniest countries in the (15%) and Senegal's Sovereign Fund world (3,000 hours a year³), Senegal for Strategic Investment (32%). has a very significant potential for solar power, but currently it has not WIND been well exploited. The country There is potential for wind power in benefits from strong sunshine over Senegal, the wind pattern in Senegal practically all its extent with an annual is 6 m/s on average (50 m above sea irradiation varying from the south-east level) on the north-east coast of the to the north-west between 1,850 and country, the Grande Côte, from Dakar 2250kWh/m²/year or an average of to Saint Louis. The potential exists on 5.7KWh/m²/d. this strip of Niayes long 200 km and 50 km wide and where agricultural Senegal's first solar plant came activities are concentrated. Pumping water for irrigation and connecting online in 2017, the 30MW plant was constructed in Santhiou Mékhé villages out of the grid are two viable

near Méouane, in the Thiés region applications of wind energy. in northwest Dakar. Its USD47 million cost was financed 53% by In 2016 the Overseas Private Investment Corporation, the US French investment firm Meridiam and by Proparco, a development government's development finance institution, and Lekela Power signed financial institution partly owned by French Development Agency a commitment for the development, and private shareholders which construction and operation of a 158MW wind farm in Taiba N'Diaye, Senegal. promotes investments in Africa, Asia, Latin America, and the Middle East. The remaining funds were provided by

BIOMASS

Biomass is the primary source of energy (55%), but it is not used in electricity generation. Although considered renewable, the use of biomass as fuel wood and cooking generates significant emissions with a harmful impact on the population. The country has good potential for the use of biomass as an electricity source through its production of agricultural waste (3.3 million dry tons).

HYDROPOWER

The Senegal River has significant hydroelectric potential, estimated at 1,200MW.⁴ Currently between approximately 60-75MW of electricity is generated from the Manantali Hydroelectric Power Plant and the Felou hydroelectric plant, each of which are shared with Mali and Mauritania.

Current Issues in the **Renewables Industry**

Communication between layers of government administration and private investors can be arduous, and a lack of local expertise in renewable energy can be problematic.



Government Incentive Schemes



Senegal is strongly committed to the development of renewable energies with the launch of several bid solicitation programs in renewable energies, including:

- The Rural Electrification Priority Program is adopted as a framework for the implementation of the State Rural Electrification Program.
- Program for the promotion of renewable energies, rural electrification and sustainable supply of domestic fuels.
- Project of sustainable management and participation of traditional and alternative energies.
- Pilot project for the production of oil from microalgae under basins.

Major Projects/Companies

| 2 | \wedge | 2 |
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| | | |

- Major projects have generally been carried out through the efforts of the government and bilateral cooperation.
- Electrification of the Saloum Islands – withsupport from the Spanish government, more than 10,000 isolated photovoltaic systems were installed and around ten villages were equipped with mini-power plants.
- Senergy 2 project initiated in 2012, the project is owned by Greenwish Africa REN, an investment vehicle bringing together 45% of foreign and local investors, including Senegal's Caisse des Depots et Consignations. The Senergy 2 solar PV plant is the first utilityscale solar PV plant operated by an Independent Power Producer to be

connected in West Africa and was commissioned in October 2016.

- The Taiba Ndiaye Wind Project in 2018, led by investors Lekela Power, is a 158MW wind farm with 40 turbines.
- The Ten Merina solar power plant in 2018: Ten Merina has similar features to the Senergy project: a generating capacity of 30MW using similar technology and combining the French expertise of investment specialists Meridiam and Solairedirect (a subsidiary of French energy provider Engle).
- Other programs are currently being implemented by Indian cooperation and other donors.







Foreign Investment/Ownership



Tax relief measures, guarantees and
benefits are granted to investors
through the code of investments.
Transparency, clarity and breadth of
benefits make this code a particularly
attractive tool for the investor.
It provides for customs and tax
benefits for new businesses and
extension projects. These benefits
include the exemption from customs
duties, the suspension of VAT and the
reduction of the tax rate on profits.

UNFCCC – Paris Commitments and beyond



Senegal ratified the Paris Agreement on September 21, 2016. In its Intended Nationally Determined Contribution, Senegal committed to reducing its greenhouse gas emissions by 5% (relative to a business-as-usual baseline) by 2030, It also committed to a further target of 21% reduction conditional on the support of the international community.

Relevant Resources and References



Relevant Websites

http://www.energie.gouv.sn/

References

- ¹ https://www.usaid.gov/powerafrica/senegal
- ² Just to flag that <u>https://www.usaid.gov/powerafrica/senegal</u> contains updated figures from March 2018 but US aid is potentially not as reliable a source.
- ³ <u>https://en.wikipedia.org/wiki/List_of_cities_by_sunshine_duration</u>
- ⁴ <u>https://www.africa-eu-renewables.org/market-information/senegal/</u> renewable-energy-potential/





South Africa Overview

KEY FACTS

Jurisdiction: South Africa has a mixed legal system, comprising elements of common, civil, and customary law.

Language(s): Official languages – Afrikaans, English, Ndebele, Sepedi, Sotho, Swazi, Tsonga, Tswana, Venda, Xhosa, Zulu.

BUSINESS ENVIRONMENT

2019 Doing Business Report: Eas Doing Business: 82 of 190 (no movement)

2019 Index of Economic Freedor 102 of 180 (down 21 rankings)

2018 Global Competitiveness Inc 67 of 140 (down 6 rankings)

2018 Corruption Perceptions Inc 73 of 180 (down 9 rankings)

2016 UN Development Program Human Development Index: 113 of 189 (up 6 rankings)

Population: 58 million

GNI per capita: USD12,860

PROFILE

| se of | Covering over 1.2 million km ² of land | | |
|-------|---|--|--|
| | and 4,620 km ² of water, South Africa | | |
| | is the 25th largest nation in the world, | | |
| | with a population of over 54 million. Its | | |
| m: | peaceful political transition is known | | |
| | as one of the most remarkable political | | |
| | feats of the past century. The African | | |
| dex: | National Congress has been driving | | |
| | the policy agenda since 1994. Due | | |
| | to consistent and sound budgetary | | |
| dex: | policies, South Africa has been able to | | |
| | tap into international bond markets | | |
| | with reasonable sovereign risk | | |
| ime | spreads. | | |

Electricity Industry Overview



The electricity market is a concentrated one dominated by Eskom, a state-owned entity. Eskom is responsible for the majority of generation, transmission and distribution of electricity in South Africa. In addition, Eskom owns, operates and maintains 95% of the national transmission network and shares the distribution network with licensed municipal distributors (see below).

Eskom generates in excess of 95% of the electricity used in South Africa and more than 40% of the electricity in Africa.

In terms of capacity, the total installed power capacity in South Africa is currently estimated to be approximately 48.27GW. The ma of generated capacity is sold by Eskom to municipalities that dis electricity to end users. Remaining generation is provided by indep power producers (IPPs) and the municipalities themselves.

Eskom's generation capacity is r up of coal (85.12%), gas (5.63%) (4.67%), nuclear (4.34%) as well wind power plants (0.23%).

Municipal generation assets cor of coal (64.4%) and gas fired pow plants (14.66%), as well as pump storage hydro power plants (20.

| majority | As at March 2016, IPPs provided | South Africa is a member of the |
|-----------|--|--------------------------------------|
| у | 3,392MW of generation capacity to | Southern African Power Pool (SAPP) |
| istribute | Eskom (of which 460MW is attributable | which allows it to trade electricity |
| ning | to coal, 588MW is attributable | with Southern African Development |
| ependent | to gas, 970MW is attributable to | Community (SADC) countries, |
| ne | wind, 1,165MW is attributable | including (among others) Botswana, |
| | to solar, 10MW is attributable to | Lesotho, Mozambique, Namibia, |
| | hydro and 199MW is attributable to | Eswatini (previously Swaziland), |
| s made | other sources). | Zambia and Zimbabwe. |
| %), hydro | | |
| ll as | A recent, notable development is that | |
| | the Department of Energy (DOE) of | |
| | South Africa has implemented the | |
| onsist | Renewable Energy Independent Power | |
| ower | Producer Procurement Programme | |
| nped | (REIPPP Programme), which allows the | |
| 0.91%). | private sector to bid for the right to | |
| | generate and sell renewable energy | |
| | to Eskom, the sole buyer under the | |
| | program (for the infusion of this | |
| | power into the national grid). | |



Electricity Laws

- National Energy Act 2008 (Act 34 of 2008) aims to ensure that diverse energy resources are available in sustainable quantities and at affordable prices in South Africa. In addition, the Act provides for the increased use of renewable energies, contingency energy supplies, the holding of strategic energy feedstock and carriers and adequate investment in energy infrastructure.
- Electricity Regulation Act 2006 (Act 4 of 2006) – establishes a national regulatory framework for the electricity supply industry to be enforced by the National Energy Regulator of South Africa (NERSA). The Minister of Energy is empowered to make determinations for the establishment of IPPs to increase the supply of electricity.

- South African state.
- petroleum pipeline industries.

Central Energy Fund (CEF) Act 1977 (Act

38 of 1977) – as amended, provides for the determination of levies to be imposed by the

National Energy Regulator Act 2004 (Act

40 of 2004) – established a single regulator to regulate the electricity, piped-gas and





Regulators NERSA

NERSA is an independent regulator established under the National Energy Regulatory Act which regulates the electricity, gas and petroleum pipeline industries. NERSA issues, amongst others, generation licenses and enforces their compliance, regulates all tariff increases proposed by Eskom, provides national grid codes, develops regulatory rules for relevant industries and determines the applicable standards.

NERSA has formulated the following five strategic outcome-oriented goals:

- facilitate security of supply to support sustainable socioeconomic development in South Africa;
- facilitate investment in infrastructure in the energy industry to support sustainable socio-economic development in South Africa;

- promote competitive and efficient functioning of the energy industry in order to sustain socio-economic development in South Africa;
- facilitate affordability and accessibility in the energy industry to balance the socio-economic interests of all stakeholders in support of economic development of South Africa and a better life for all; and
- position and establish NERSA as a Independent generation assets credible and reliable regulator in (including those procured under order to create regulatory certainty. the REIPPP Programme) are highly leveraged on wind and solar Generation, Distribution (both concentrated solar and photovoltaic), with coal, landfill gas and hydro power making up There are three notable sources of the most notable portion of the energy generation in South Africa balance.

and Transmission **GENERATION**

- Eskom, municipalities and IPPs. The energy mix for these sources of generation are detailed below:

- Eskom's generation assets are leveraged heavily on coal (greater than 80%) with gas, hydro, nuclear and wind power each contributing less than 6% to its generation capacity.
- Municipal generation assets are, again, highly leveraged on coal (greater than 60%) with the remainder predominantly reliant on gas fired power and hydro power

Approximately 7% of South Africa's electricity production comes from renewable sources.

TRANSMISSION

Transmission of electricity, via the transmission network, is undertaken almost exclusively by Eskom (95%). Power is transmitted from power stations over high voltage transmission lines to various substations across the country. The network of transmission lines is referred to as the National Grid.

At the destination substations, power is transformed or stepped down to lower voltages to allow for distribution. South Africa has about 28,000 km of high voltage transmission lines.

DISTRIBUTION

Distribution via the distribution network, which is the final stage in the delivery of electricity to end users, is currently undertaken by Eskom, together with 187 municipalities. South Africa has roughly 325,000 km of distribution lines.

South Africa's distribution industry has been in severe difficulty, primarily due to well publicized financial difficulties at both municipal level and at Eskom level which has led to a maintenance backlog of distribution assets. However, Eskom is making progress under its universal electrification program. It has spent approximately USD390 million connecting 275,830 new households to the electricity grid across South Africa during the 2017/2018 financial year.

Renewable Energy Overview



South Africa has an abundance of renewable energy resources, in particular solar and wind.

Although there has been a fair amount of traction in the emergence of off-grid renewable energy solutions, these have by and large been self-consumption projects. The majority of renewable energy projects, of any notable size, which are not self-consumptive, have been procured pursuant to the REIPPP Programme.

The DOE has published the 2010-2030 Integrated Resource Plan (IRP) which is a 20-year projection and living plan on electricity supply and demand in South Africa. It is aimed at, among other things, reducing South Africa's primary reliance on fossil fuels (such as coal and diesel), and diversifying the national energy mix to include renewable energy.

The current IRP sets out a target of the Inga Hydro Power Project) and 13,225MW of renewable energy split 1,000MW (coal, which relates to two down into targets of 4,725MW to already procured projects). The wind be produced by photovoltaic solar, and solar allocations would likely be 6,360MW by onshore wind, 1,200MW procured under upcoming rounds of by concentrated solar, 195MW for the REIPPP Programme and the gas/ small hydro, 25MW for landfill gas, diesel allocations are likely (at least 210MW for biomass,110MW for in part) to be procured under an biogass and 400MW for small-scale upcoming gas-to-power programme renewable energy projects (small to be implemented by the DOE. The scale solar, wind, biomass and landfall Draft IRP Update has run a 60-day gas projects with a generation public comment and consultation capacity of between 1-5MW each). process but is, at the date of this On August 27, 2018, the DOE publication, still to be finalized. published the Draft IRP 2018 (Draft IRP Update), which was intended to The REIPPP Programme is intended be a draft update to the current IRP. to be one of the mechanisms used to Among other things, the Draft IRP deliver on the commitment to achieve certain of the IRP targets. To date Update made the following proposed allocations for new additional there have been five bid windows capacity to be procured prior to 2030: (BWs) of the REIPPP Programme, in 8,100MW (wind), 8,100MW (gas/ which preferred bidders have been diesel), 5,670MW (solar, photovoltaic appointed in the following capacities: only), 2,500MW (hydro, which will facilitate the RSA-DRC Treaty on • BW1 – 1,425MW of

contracted capacity;

- BW2 1,040MW of contracted capacity;
- BW3 1,457MW of contracted capacity;
- BW3.5 200MW of contracted capacity; and
- BW4 2,205MW of contracted capacity.

For the most part, the legal framework in South Africa does not allow IPPs to sell energy into the grid outside of the REIPPP Programme, although Cape Town has piloted a program (due to a series of amendments to the local regulatory regime) allowing this which has yielded limited success. The Black River Park Solar project, with a total project size of 1.2MW (one of the world's largest roof mounted

solar PV systems), is able to generate just under 2 million kWh per year from about 5,500 modules and has a guaranteed lifetime of 20 years. This is one of the only projects which has been able to successfully take advantage of this development. One of the drawbacks is that such a project will be subject to some fairly onerous conditions, including (i) that the producer must be a net user (buying more electricity than it sells); (ii) a bidirectional meter must be installed by the municipality (which must be purchased by the producer); and (iii) there is a daily fee payable to Eskom (approximately ZAR13 per day (which is in stark contrast to a country like France, which charges the equivalent of approximately ZAR1.50 per unit to domestic producers)).

Current Issues in the **Renewables Industry**

Under the REIPPP Programme, the majority of preferred bidders under BW 3.5 and 4 and the small-scale renewable energy program have experienced substantial delays and a certain degree of controversy surrounding these delays after Eskom refused to sign PPAs for 27 renewables projects that had won preferred bidder status in 2015.

One of the issues hindering the implementation of these projects has also been the ongoing debate about whether government should, as an alternative, pursue a nuclear energy program and whether this poses a cost benefit to the country (as opposed to the cost associated with the implementation of renewable

human capital for generating the energy projects). However, this debate seems to have been dispensed with, coal required to produce electricity, principally due to several studies thereby leading to job losses. The showing renewable energy to be interdict was subsequently overturned the more cost effective option and on March 29, 2018 by the High Court, changes in high level appointments at ruling that the application was not the DOE (including the minister). urgent. The most recent development in Following the subsequent ruling, this stemmed from an urgent bid to the Minister of Energy has signed interdict the signing of PPAs for the a number of these outstanding PPAs, adding more than 2,300MW of aforementioned projects procured during rounds 3.5 and 4 of the REIPPP electricity to the National Grid. Programme. On March 12, 2018, The president has recently merged the National Union of Mineworkers of South Africa (NUMSA), together the departments of mineral resources with Transform SA, applied for and and energy, appointing the former obtained an urgent court interdict minister of mineral resources (Gwede stopping Eskom from signing these Mantashe) as the minister responsible 27 PPAs. The applicants alleged for the newly merged department.

that signing of these contracts would result in Eskom requiring less

Government Incentive Schemes



Other than the REIPPP Programme, tax incentives have been provided by the South African Revenue Service in the form of a capital allowance for assets used in the production of renewable energy.

Major Projects/Companies



A list of notable projects announced as preferred bidders under the REIPPP Programme is included at Appendix A. Several notable projects or transactions are listed below.

Touwsrivier Project – this 44MW project was sponsored by Soitec SA and is notable for two reasons. First, it is larger than any operational concentrating photovoltaic CPV plant in the world. Second, it was financed by a USD110 million bond which is the first publicly-listed project bond ever issued to finance a CPV plant, as well as the first time that a bond has been used to finance a solar plant in South Africa.

Bokpoort CSP – this 50MW concentrating solar power plant project utilized parabolic trough technology and was built by a joint venture of Spanish companies ACCIONA, SENER and TSK and South Africa's Crowie for ACWA Power. The project is the first in Africa equipped with molten salt tanks that provide a thermal storage capacity of 9.3 hours. In its first month of commercial operation, the plant produced electricity continuously for 161 hours (or more than six days) which, we understand, was a new record at the time for a plant of this type in Africa.





Foreign Investment/Ownership



The DOE has reported that the REIPPP Programme has resulted in USD14 billion of foreign economic direct investment and created over 20,000 construction and 35,000 operational jobs.

Minimum ownership by localcommunities in an IPP of 2.5% isrequired as a procurement condition.Minimum ownership by black peoplein an IPP of 12% is required as aprocurement condition.

There are no restrictions on foreign ownership of companies in South Africa.
UNFCCC – Paris Commitments and beyond



South Africa ratified the Paris Agreement on November 1, 2016 and in its Intended Nationally Determined Contribution committed the country to a peak, plateau and decline trajectory range for greenhouse gas emissions, with the overall target for emissions by 2025 and 2030 to be in a range between 398 and 614 Mt CO₂e.

Relevant Resources and References



Relevant Websites

https://www.africa-eu-renewables.org/market-information/south-africa/energy-<u>sector/</u>

https://www.gov.za/about-sa/energy

https://www.gcls.gov.za/sites/default/files/docs/resourcecentre/yearbook/ Energy-SAYB1516.pdf









Tanzania

Overview

KEY FACTS

Jurisdictions: The Judicial system of the United Republic of Tanzania is based on the common law legal system made up of British laws, as well the laws do adhere to the Tanzania customary laws as well as Islamic Laws in few aspects.

The Legal system contains the Court of Appeal of Tanzania, the High Court of Tanzania (Commercial Division, Labour Division, Economic Crimes Division and the Main Registry), these are the two courts of records. Other than the two highest courts, there is the Resident Magistrate's Court, the District Court and the Primary Courts.

Languages: English, Swahili.

BUSINESS ENVIRONMENT

2018 Doing Business Report:

Being a union between Tanzania Mainland and Zanzibar Island to form 144 out of 190 economies (up 7) what is now called Tanzania; or referred 2018 Global Competitiveness: to as the hub of peace. His Excellency 113 out of 137 (up 3) John Pombe Magufuli was elected the 2017 Index of Economic Freedom: fifth president of the United Republic of Tanzania in 2015. Since his appointment, 97 out of 180 the services industry and infrastructure 2016 Corruption Perceptions Index: have attracted investment, while the 116 out of 176 (down 1) country's tourism industry keeps on blooming, with the benefits from being 2016 UN Development programme the home of Mt. Kilimanjaro and National Parks like the Serengeti, 151 out 188 (up 1) and the Ngorongoro crater. Tanzania has Population: 57.31 million been endowed with diverse renewable GNI per Capita: USD2,920 energy resources including, hydropower, biomass, solar and wind. Tanzania is also endowed with Natural gas.

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Human Development Index:

PROFILE

Electricity Industry Overview



Electricity is provided by a central grid which is owned by a state utility known as TANESCO (Tanzania Electricity Supply Company Limited). TANESCO is the primary source for electricity generation, distribution and transmission in Tanzania, with a current generation capacity of c1500MW. However, demand is projected to increase sharply to 4700MW by 2025 due to an increase in industrial activities.

TANESCO is the only entity currently with the license to sell electricity directly to end users through the Main Grid. The electricity laws allow generation and distribution of electricity to end users in remote areas.

There are isolated mini-grids in remote areas which produce electricity through renewable energy sources. Recent developments have led to natural gas becoming a major source of electricity generation; however, increased hydropower and solar power schemes demonstrate the potential for renewable electricity generation in the country. The Tanzanian government's Power System Master Plan (PSMP) looks to exploit such potential through the development of a portfolio of diversified power sources which provide a resilient and flexible generation base.



Electricity Laws

Electricity generation, distribution and transmission is governed by:

- The Electricity Act.
- The Energy Water Utilities Regulatory Authority Act.
- The following regulations/rules:
 - The Electricity (Generation, Transmission and Distribution Activities) Rules, 2018 GN 442;
 - The Electricity (Development of Small Power Projects) Rules, GN. No 77 of 2018;
 - The Electricity (Grid Distribution Codes) Rules GN No. 441 of 2017;
 - The Electricity (Market Re-Organization and Promotion of Competition) Regulations, GN No. 325 of 2016; and
 - The Electricity (Licensing Fees) Rules 2016.



Regulators

• The Ministry of Energy (MOE)

MOE is responsible for policy formulation and implementation. It enables policies and laws which facilitate an environment for stakeholders to invest in the energy sector, which includes renewable energy.

• The Energy Water and Utilities Regulatory Authority (EWURA)

The EWURA is responsible for the technical and economic regulation of Tanzania's electricity, water, oil and gas.

• TANESCO

TANESCO is a state-owned company and is the main generator, transmitter and distributor of electricity.

• The Rural Energy Agency (REA)

The REA is a body under the MOE and spearheads the promotion of access to electricity in rural areas.

Generation, Distribution and Transmission

- Generation, transmission and distribution is monopolized by TANESCO, which also owns the national grid.
- Licenses for generation, distribution and transmission are issued separately.
- There are a few isolated mini grids that generate and distribute electricity in isolated areas.

Renewable Energy Overview



Renewable energy is mostly available in rural areas where the national grid is not available. Therefore, renewable energy generation is more focus and centralized in community development.

Generation of electricity through renewable sources is slowly integrating with the commercial electricity production. However, as renewable energy currently only provides electricity to mini-grids wide scale utilization has not been achieved.

Renewable Energy Sources

SOLAR POWER

The country's high levels of solar energy have provided the basis for a range of on-grid and off-grid solar plants. The off-grid market is supported by the Sustainable Solar Market Package offering incentives

for the delivery of power to public facilities. Large scale grid-connected plants are envisaged by the PSMP which identifies a potential for c800MW of solar generation.

GEOTHERMAL

The country has the potential for significant electricity generation from geothermal which the National Task Force on Geothermal Development has been mandated to develop.

HYDRO POWER

Hydro power has played a key role in the country's electrical generation and remains a target for increased production through both large and small scale schemes. The government's PSMP identifies 16 potential large scale schemes with a combined generation capacity of c.3,000MW and a series of small scale schemes with an additional capacity of c480MW.

WIND POWER The areas of Kititimo and Makambako

have been identified as potential sites for the development of wind power generation.

Renewable Energy Laws

• The Electricity (Generation, Transmission and Distribution Activities) Rules, 2018 GN 442.

Renewable Energy is governed by:

- The Electricity (Development of Small Power Projects) Rules.
- The Electricity (NET-METERING) Rules, 2018, GN 76.

Government Incentive Schemes



There are no large-scale government incentives schemes in relation to renewable energy generation. Further there are no tradable green certificates issued by the Ministry of Energy. However, there is a Scaling up renewable Energy Program that is implemented by the Ministry of Energy, as an initiative to promote mini grids and renewable energy generation.

Major Projects/Companies



MAJOR PROJECTS

- Rural Energy Agency Projects (REA) partly funded by the Sustainable
 Energy Fund for Africa (SEFA) of the
 African Development Bank.
- World Bank's International Finance Corporation – Farm Wind Project 100MW Project.
- Tanzania Lighting Africa Project.

PROJECT COMPANIES

- Rift Valley Energy
- Norsk vind Energi
- MCC 20 Hainan International
- Aldwych International Limited

Foreign Investment/Ownership



Foreign investments is mostly focused World Bank conducting an Energy on hydro and solar energy generation. Sector Management Assistance However, studies indicate that wind power is likely to become an area for investment in the future. The first major wind power project is underway in Singida.

Foreign investment is minimal in bioenergy and geothermal energy.

The potential in Tanzania for renewable energy has resulted in the

Program. The program aims to create an energy map using satellite imaging and required an investment of USD2 million. The program has made mapping data on energy available, which has had the flow on effect of increasing foreign investments in the renewable energy sector in Tanzania.



UNFCCC – Paris Commitments and beyond



Tanzania ratified the Paris Agreement in April 2018. The country's Intended Nationally Determined Contribution contained a commitment to reduce emissions by 10-20% (relative to a business-as-usual baseline) by 2030,

Relevant Resources & References

Relevant Websites



Tanzania Mainland

Ministry of Energy https://www.nishati.go.tz/

Ministry of Finance and Planning http://www.mof.go.tz/

Energy and Water Utilities Regulatory Authority (EWURA) http://www.ewura.go.tz

Tanzania National Electric Supply Company (TANESCO) http://www.tanesco.co.tz/

Rural Electrification Agency http://www.rea.go.tz/

Zanzibar Island

Ministry of Land, Housing, Water and Energy https://www.zanzibar-energy.com

Ministry of Finance and Planning https://www.mofzanzibar.go.tz/

Zanzibar Renewable Energies Efficiency Programme https://www.zanzibar-energy.com

Zanzibar Utilities Regulatory Authority (ZURA) http://www.zura.go.tz/

Zanzibar Electricity Corporation https://zeco.co.tz/





Uganda

Overview

KEY FACTS

Jurisdictions: The Constitution of of the Republic of Uganda 1995 (as amended), Acts of Parliament, Common Law and Equity.

Languages: English.

BUSINESS ENVIRONMENT

2019 Doing Business Report: 127 of 190

2018 Global Competitiveness Index: 117 of 140

2017 UN Development ProgrammeHuman Development Index:162 of 189

Population: 43 million

GNI per capita: USD1,820

PROFILE

Uganda is a landlocked country in East Africa and is well-known for its natural beauty, savannah, wildlife and warmth of its people. Uganda is also one of the world's fastest-growing populations. Uganda is a founding member of the East African Community, and has significant trading links with neighbors Kenya, Tanzania, Rwanda, Burundi, South Sudan and the Democratic Republic of Congo. A fully-liberalized economy, Uganda's economic development blueprint, Vision 2040, sets out to transform Ugandan society into a modern and prosperous middle-income status country by 2040,

Electricity Industry Overview



The Uganda energy sub-sector is partially liberalized and delineated across three discrete areas: generation, transmission and distribution. The sector regulator is the Electricity Regulatory Authority (ERA), established in 1999 following the enactment of the Electricity Act 1999.

Uganda has an installed capacity of approximately 1,179.2MW and a system peak demand of approximately kWh (a reduction of 17.45%) one 650-700MW. Installed and generation capacity is dominated by hydropower. The three major power dams are Bujagali II (250MW), Isimba (183MW) and Nalubaale [Owen Falls] (180MW). Currently, construction is ongoing on the 600MW Karuma dam, which is expected to be commissioned in December 2019. Additional hydropower projects with a total rating of 1,954MW are currently in various stages of studies and development.

The total transmission network le is 2,569.8 km (1,008 km of 220 kV 1,526 km of 132 kV and 35.2 km 66 kV).

The role of establishing a tariff structure and investigating tariff charges is vested in ERA, and U tariff model is a cost-reflective ta Uganda's weighted generation is currently USDC 6.67/kWh and expected to reduce to USDC 5.3 the Karuma hydropower dam is commissioned.

In terms of rural electrification, government of Uganda establish the Rural Electrification Fund in 2001 with the primary objective promoting the equitable coverage of rural electrification in Uganda through the increased provision access to electricity for economi social and household use. The F Electrification Fund is administered

| ength /, of | by the Rural Electrification Agency (REA). The government has so far implemented over 10,000 km of medium-voltage power lines and approximately 9,000 km of low-voltage distribution power lines. This has |
|-------------------|---|
| f | translated into the connection of |
| ganda's | over 700,000 customers onto the |
| ariff. tariff | national grid. |
| l it is | With respect to off-grid energy, |
| 34/ | ERA has licensed several private and |
| ce | REA-sponsored isolated grids so as to, majorly, promote rural electrification. Off-grid installed generation capacity currently stands at 7.5MW. |
| the | |
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| Rural | |
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Electricity Laws

- The Constitution of the Republic of Uganda 1995 (as amended) – provides for the government of Uganda's responsibility to develop an energy policy.
- Electricity Act 1999 and accompanying regulations/statutory instruments – provides
 for the establishment of the sector regulator,
 the generation, transmission, distribution, sale
 and use of electricity, the licensing and control
 of activities in the electricity sector and the
 liberalization of the electricity sector.



Regulators

- Minister of Energy and Mineral **Development** – responsible for energy policy formulation through which it provides an enabling environment for all stakeholders.
- Electricity Regulatory Authority - the energy sub-sector regulator established by the Electricity Act to regulate, license and supervise the generation, transmission, distribution, sale, export, and importation of electrical energy in Uganda, and other related matters.
- Rural Electrification Fund established by the Electricity (Establishment and Management of the Rural Electrification Fund) Instrument 2001 to promote the equitable coverage of rural electrification in Uganda through the increased provision of access to electricity for economic, social and household use.

Generation, Distribution and Transmission

On-grid electricity generation is a fully liberalized market, with several projects sponsored by both private and governmental entities. In principle, the licensing process for generation under the Electricity Act is an unsolicited, non-competitive framework, and ERA's role is to evaluate applications received from project developers against a defined set of eligibility criteria. Only in exceptional cases will ERA issue a generation license under the Electricity Act through a competitive tender process, in which the mainstream procurement rules will apply alongside the Electricity Act. Importantly, generation licenses are not issued as of right. ERA considers

the prevailing government policy at the time, the available spinning reserve for a particular source of power based on national peak demand, the general state of the national energy mix and other with ranging technical, financial and policy considerations before decian application.

The distribution function is also for liberalized, and with nine entities licensed to distribute electricity. Of key player is the Uganda Electricity Distribution Company Limited (UEDCL), a governmental entity formed for the specific purpose of distributing electrical energy in licensed territories and which owns the 33KV-and-below voltag electricity distribution grid in Uga Umeme Limited is a well-known

| У | public limited company which took |
|--------|---|
| ng | over the distribution system for the |
| f | supply of electricity from UEDCL in |
| | certain territories under a concession |
| е | (including all the associated |
| vide- | operational assets) for the period |
| | March 1, 2005 to February 28, 2025. |
| ciding | |
| | Electricity transmission is handled by |
| | the Uganda Electricity Transmission |
| fully | Company Limited (UETCL) under |
| S | Uganda's singe buyer/off-taker |
| One | electrical energy purchase model. |
| city | UETCL is a governmental entity |
| | formed for the specific purpose of |
| | bulk power supply/transmission and |
| | system operation, operation of high |
| | voltage transmission grid and power |
| | import and export. The 33KV-and-over |
| ge | electricity transmission grid in Uganda |
| anda. | is operated by UETCL. |

Renewable Energy Overview



Uganda's 2007 Renewable Energy Policy sets out to make modern renewable energy a substantial part of the national energy consumption. The overall policy goal is to increase the use of modern renewable energy to over 60% by 2020.

Uganda developed a bespoke renewable energy policy and encouraged investment in renewable energy sources because of four unique challenges: an electricity supply deficit on the national grid, escalating oil prices on the international market, the need to make electricity accessible to the rural population through grid extension and isolated grids and to fulfil the government's commitment on greenhouse gas emissions reductions under the Kyoto Protocol and contribute to the global fight against climate change.

According to Vision 2040, Uganda expects to increase its installed capacity to 41,738MW. The required capacity is projected to be generated from renewable energy technologies such as geothermal (1,500MW), nuclear (24,000MW) solar (5,000 MW), biomass (1,700MW) and peat/biomass (800MW).

To promote the development and use of renewable energy sources, the government of Uganda has developed the renewable energy feed-in-tariff (RE-FiT) as an instrument for promoting private sector generation of electricity from renewable energy sources. The Ugandan RE-FiT is designed to provide price certainty to renewable energy generators. Depending on the phase, the tariff covers a number of technology and not the avoided cost.

Uganda currently has 40MW of solar grid-connected systems: 20MW technologies and is attractive because operated by MSS Xsabo Power Limited (Great Lakes Energy Company), 10MW it is based on the levelized cost of each operated by Access Solar Uganda Limited (Access Power) and 10MW operated by Tororo Solar North Uganda **HYDRO** Although hydropower contributes the Limited (Building Energy Italy). An bulk of energy production in Uganda, additional 20MW is expected to be the risk of unreliability during periods commissioned: 10MW operated by of drought has caused the government Emerging Power (Uganda) Limited (Access Power and Total Eren) to consider solar, wind, thermal and geothermal generation in its current and 10MW operated by Tororo PV plans for the energy sector. The fall Power Company Limited (Aga Kham of water levels in Lake Victoria is Development Network and Fotowatio Renewables Ventures). Two of the considered a particular risk concern. projects (Access Solar Uganda Limited The development of mini-hydro power and Tororo Solar North Limited) were dams is a special focus area. Under the developed under the GET FiT Program.

GET FiT Uganda Program, 14 mini-hydro

dams with a total rating of 118MW were licensed. The main objective of the GET FiT Program is to assist East African nations in pursuing a climate resilient low-carbon development path resulting in growth, poverty reduction and climate change mitigation.

SOLAR

ERA has also licensed several private and REA-sponsored isolated grids with a capacity of 0.5-2MW so as to, promote rural electrification.

Various private companies also provide pay-as-you-go energy for off-grid customers by selling solar home systems on an affordable payment plan to domestic consumers who are not connected to grid-supplied electricity.

WIND

Uganda has no grid-connected wind systems. An off-grid solar and wind hybrid system is currently operating and supplying power to rural communities in Kotido, Napak and Namayingo districts. These systems supply power to households, health centers and schools.

The Ministry of Energy and Mineral Development is in the process of developing a wind resource map.

GEOTHERMAL

The exploitation of geothermal energy is currently at exploration stage. Exploration has been carried out in

the main geothermal areas of Kibiro, Panyimur and Buranga. Drilling of temperate gradient wells is expected to start in Kibiro and Panyimur in 2019. In order to attract private sector participation, the government is currently developing a geothermal policy and legislation.

BAGASSE/CO-GENERATION

Co-generation using bagasse as a primary fuel is common practice in the domestic sugar industry. Uganda's 2010 National Sugar Policy encourages sugar factories to produce close to 100MW of green electricity from burning bagasse, mainly for own-use and with the surplus to be dispatched for sale to the national grid.

A 20MW bagasse plant operated by Kakira Sugar Limited plant was licensed under the GET FiT Program. Another 26MW co-generation plant operated by SCOUL Uganda has also been licensed and awaits commissioning.











Government Incentive Schemes



In order to attract foreign direct investment in the renewable energy sector, the government has undertaken the following initiatives:

- ERA has developed standardized power purchase agreements, implementation agreements and model licenses in consultation with development partners, lenders and project developers. This has resulted into the reduction in advisory service costs and the time required to negotiate the power purchase agreement between the developers and the single off-taker (UETCL).
- Development of the renewable energy feed-in-tariff as an instrument for promoting private sector generation of electricity from renewable energy sources.

• Providing a value added tax exemption in respect of the supply of any goods and services to the contractors and subcontractors of hydroelectric power, solar power, geothermal power or bio-gas and wind energy projects.

Major Projects/Companies



- 600MW Karuma hydropower dam: When completed in December 2019, the 600MW Karuma hydropower dam will be Uganda's largest rated dam. The project is developed by the government of Uganda, with the Uganda Electricity Generation Company Limited as the implementing agency. The engineering, procurement and construction contractor is China's Sinohydro Corporation. The project is financed through a government concessional loan facility from China's Exim Bank.
- 250MW Bujagali II hydropower dam: Uganda's second largest generation facility, which was commissioned in July 2012. The project is owned by the Aga Khan Fund for Economic Development and Norway's SN Power AS

(through special-purpose vehicles). The project was financed through a syndicated loan from a cluster of development financial institutions and commercial banks led by the International Finance Corporation and the African Development Bank.

• 183MW Isimba hydropower dam: The 183MW Isimba hydropower dam was commissioned in March 2019. The project is developed by the government of Uganda, with the Uganda Electricity Generation Company Limited as the implementing agency. The engineering, procurement and construction contractor was China International Water and Electric Corporation. The project is financed through a government concessional loan facility from China's Exim Bank.

dam: The Nalubaale dam (previously named the Owen Falls dam) was constructed between

180MW Nalubaale hydropower

1947 and 1954 when Uganda was still a British Protectorate. It is currently owned by the government of Uganda (through the Uganda Electricity Generation Company Limited). Eskom Uganda Limited (a subsidiary of Eskom Holdings South Africa) holds a 20-year concession to operate, manage and maintain the dam.

• Independent solar power

projects: ERA has licensed 60MW of on-grid solar generation capacity. 40MW has so far been commissioned.

Foreign Investment/Ownership



Uganda's economy is fully liberalized and there is no restriction against foreign investors and investments, including in the electricity sector.

The Investment Code Act 2019 contains a requirement for all foreign investors to hold an investment license, but this requirement can be properly classified as an administrative nature and scope of incentives to be compliance matter for all foreign investors and does not act as an entry barrier. Significantly, the investment license is subordinate to any license granted by a regulatory authority in a business sector in which the foreign investor plans to operate. A foreign investor includes a company incorporated under the laws of any country other than that of an East African Community Partner State, or a company incorporated under the laws of Uganda in which the majority of the

shares are held by a person who is not no governmental consent (such a citizen of an East African Community Partner State.

The Investment Code Act provides that a qualifying foreign investor is entitled to a certificate of incentive which shall provide details of the incentives given. The Act does not set out the provided, and it is expected that this important aspect will be addressed in subsidiary regulations to be passed in due course.

Uganda has no exchange control restrictions. The applicable regulatory requirement is that all payments in foreign currency, to or from Uganda, between residents and non-residents, or between non-residents, shall be made through a licensed commercial bank. The net effect of this liberalized exchange control position is that

as, for example, that of the Central Bank or the Minister of Finance) is required to pay foreign currency in and out of a bank account held in a Ugandan commercial bank. Payments in this respect include fees/ charges to off-shore suppliers and contractors and dividends to nonresident shareholders.

There is a blanket prohibition under Ugandan law against foreign companies owning or holding land in perpetuity (freehold or mailo tenure) interest in land. Foreign companies can only hold a leasehold (periodic) interest granted by a Ugandan citizen for a maximum single period of 99 years.

UNFCCC – Paris Commitments and beyond



Uganda ratified the Paris Agreement 2016 (an agreement within the United Nations Framework Convention on Climate Change) on September 21, 2016. In line with this global commitment, Uganda's Nationally Determined Contribution Support Programme seeks to help the country reduce greenhouse gas emissions in forestry and wetlands, energy, transport and agriculture sectors. It is projected that this programme will catalyze investment towards realizing Uganda's commitment for 22% greenhouse gas emissions reduction by 2030, In 2018, Uganda became the first country in Africa to sign the United Nations Development Programme Development Partnership Plan for Nationally Determined Contributions.

Relevant Resources and References



Relevant Websites

Ministry of Energy and Mineral Development – https://www.energyandminerals.go.ug/

Ministry of Finance, Planning and Economic Development – <u>https://www.finance.go.ug/</u>

Electricity Regulatory Authority – https://www.era.or.ug/

Uganda Electricity Transmission Company Limited – <u>http://www.uetcl.com/</u>

Uganda Electricity Generation Company Limited – <u>https://www.uegcl.com/</u>

Rural Electrification Fund – <u>http://www.rea.or.ug/</u>







Zambia

Overview

KEY FACTS

Jurisdictions: Common law and the Constitution of Zambia, adopted in 1991 and most recently amended in 2016.

Languages: English (official language), Bemba, Kaonde, Lozi, Lunda, Luvale, Nyanja/Chewa and Tonga.

BUSINESS ENVIRONMENT

2019 Doing Business Report: 86 of 190 (up 1 ranking from 20

2018 Global Competitiveness In 118 of 138 (no movement)

2019 Index of Economic Freed 138 of 180 (down 16 rankings from 2017)

2018 Corruption Perceptions In 105 of 180 (up 9 rankings from

2017 UN Development Program Human Development Index: 144 of 189 (down 4 rankings from 2016)

Population: 17.09 million (2017)

GNI per capita PPP: USD3,920 (2017)

PROFILE

| | Formerly known as Northern Rhodesia |
|-------|--|
| 018) | until it was renamed upon gaining |
| adov: | independence in 1964, Zambia is |
| iuex. | a presidential democratic republic. |
| | It is split into ten provinces and 100 |
| dom: | districts, with the capital city being |
| | Lusaka. Zambia's largest economic |
| | sector is mining, with other major |
| dov: | sectors being agriculture and tourism. |
| 2017 | Economic growth, whilst previously |
| 2017) | good, has slowed and has maintained |
| nme | at approximately 3% since 2015. |



Electricity Industry Overview



- The installed generation capacity as of June 30, 2017 in Zambia was 2,885.91MW which is comprised predominantly of generation from hydropower, followed by generation from coal, heavy fuel oil and diesel respectively.
- As at 2017, 26% of the Zambian population have access to electricity. This is made up of 45% of the urban areas and 14% of rural areas.
- ZESCO Limited (ZESCO), a vertically integrated electricity utility, dominates the market in generation, transmission, distribution and supply. It is a public utility, with the government of the Republic of Zambia being the sole shareholder. According to figures from the

Zambia Development Agency (ZDA), electricity demand in Zambia has increased at an average 3% (150-200MW) each year.

- Zambia's power sector is liberalized environmental costs. and private participants can get a The 2008 NEP accordingly seeks, license for generation, transmission • inter alia, to: or supply.
- The Zambian government formulated the first National Energy Policy (NEP) in 1994 which sought to promote optimal supply and utilization of energy, especially indigenous energy forms, for socio-economic development in a safe and healthy environment. The NEP was revised in 2008, with focus tilting towards diversification of the country's energy mix through use of renewable energy

- and creating conditions that ensure availability of adequate supply of energy from various sources which are dependable at the lowest economic, financial, social and
- promote the modern use of biomass for electricity generation, LPG and biofuels. To achieve this goal, a Biofuels Framework was put in place and blending ratios defined i.e. ethanol 10% and bio-diesel 5%;
- expand generation and transmission capacity. To achieve this goal a Power

- Systems Development Master Plan was put in place which provides for an increased generation capacity target of 4,337MW by 2030;
- increase nationwide access to electricity. To achieve this goal a Rural Electrification Master Plan was put in place which sets targets of increased access to electricity at 66% at nationwide level, 91% in urban areas and 51% in rural areas by 2030;
- increase the contribution of coal as energy source in the national energy mix;
- increase the utilization of renewable energy sources by addressing the barriers to their wider dissemination. To achieve

- this goal, a Renewable Energy Strategy was developed by the Ministry of Energy and the United Nations Development Programme. Solar and wind resource map has also been an ongoing exercise;
- promote efficient energy use through energy conservation and substitution; and
- promote cost reflective tariffs. To achieve this goal, a Renewable Energy Feedin Tariff (REFIT) Policy was developed in 2015.

Electricity Laws

- Electricity Act: Chapter 433 of the Laws of Zambia (1995) – The Electricity Act regulates the generation, transmission, distribution and supply of electricity in Zambia, as well as provides for matters connected with or incidental thereto. The Act generally prohibits the establishment or operation of an undertaking for the generation, transmission, distribution or supply of electricity other than in accordance with the Act and the Energy Regulation Act.
- The Electricity (Grid Code) Regulations, Statutory Instrument No. 79 of 2013 – The Electricity (Grid Code) Regulations specify technical requirements for connection to, and use of, the national electricity transmission system (the Zambian Grid). Any undertaking that seeks to connect to or otherwise use the Zambian Grid will be required to comply with the regulations.
- energy sector in Zambia.

Energy Regulation Act: Chapter 436 of the Laws of Zambia (1995) – The Energy Regulation Act provides for, inter alia, the licensing of undertakings for the generation, transmission, distribution or supply of electricity and matters connected with or incidental thereto. In terms of the Act a person may not establish or operate an undertaking except in accordance with the Act and under the authority of a license issued under the Act. The licenses which may be granted under the Act in the electricity sub-sector are: a generation license, a transmission license, a distribution license and a supply license. The Act also establishes the Energy Regulation Board (ERB) as the authority responsible for the regulation of the





Regulators

The Energy Regulation Board (ERB) is responsible for regulation of the industry in all aspects. The ERB is established under section 3 of the Energy Regulation Act. The ERB is governed by a board which consists of seven non-executive members appointed by the Minister of Energy from among eminent persons who have adequate knowledge, experience and qualifications in engineering, finance, law, natural resources management, electricity industry, petroleum industry and administration. The chairperson and vice chairperson of the board are elected from among the members.

The ERB's functions include:

issuance of licenses in the energy sector;

- monitoring efficiency and performance of licensees;
- receiving and investigating consumer complaints relating to, inter alia, services provided by undertakings and price adjustments by undertakings, and regulating such services or price adjustments by the attachment of appropriate conditions to licenses held by undertakings or by such other means as the board considers appropriate;
- regulating the location or construction of a common carrier or energy facility, including the installation or the carrying out of any works by any undertaking;
- monitoring competition in the energy sector with the Competition and Consumer Protection Commission with a view to promoting competition and accessibility to any company or individual who meets the basic requirements for operating as a business in Zambia, and developing and implementing appropriate rules to promote competition in the energy sector;
- in conjunction with the Zambia
 Bureau of Standards, designing
 standards relating to the quality,
 safety and reliability of supply of
 energy and fuels; and
- monitoring environmental energy issues with the Zambia Environmental Management

Agency, formulating measures to minimize the environmental impact of the production and supply of energy and enforcing such measures by the attachment of the appropriate conditions to licenses held by an undertaking.

The Minister of Energy exercises a supervisory role over the ERB. The Department of Energy under the Ministry of Energy and Water Development provide general policy guidance and energy resource management.

Generation, Distribution and Transmission

According to the ERB, the total national installed generation capacity as of June 30, 2017 stood at 2,885.91MW, comprising 2,392.3MW of hydro generated power, 300MW of coal generated power, 88.6MW of diesel generated power, 105MW of heavy fuel oil (HFO) generated power, and 0,06MW of solar generated power. The majority of generation capacity is owned and operated by ZESCO which, as at June 30, 2017, had a total of 1,856.5MW in installed hydro generation plants and 8.6MW in installed diesel generation plants. Other power producers owned the remaining 1,020,81MW of installed generation capacity, with the main ones being Kariba North Bank Extension Power Corporation (360MW), Maamba Collieries Limited (300MW), Itezhi-Tezhi Power Corporation (120MW), Ndola Energy Company Limited (105MW), Copperbelt Energy Corporation Plc (80MW) and Lunsemfwa Hydro Power Company Limited (55MW).

The majority of the distribution and transmission activities are carried out by ZESCO. The ZESCO transmission grid comprises transmission lines and substations at 330kV, 220kV, 132kV and 66kV voltage levels. ZESCO's transmission and distribution systems across the country measure in excess of 4,700 km. The backbone of the ZESCO grid is built on a 330kV transmission system (covering about 2,241 km) running from the southern part of the country where the major generating stations are located. About 348 km of 220kV transmission lines serve as interconnectors with the neighboring Democratic Republic of Congo (DRC), Namibia and Zimbabwe. The company also has widespread telecommunications networks following the installation of optic fibre on its transmission lines.

The Copperbelt Energy Corporation Plc (CEC), a privately owned company, also owns a transmission and distribution network consisting of over 1,000 km of 66kV and 220kV transmission lines and 42 high voltage substations. According



Source: IRENA

to CEC, the company's transmission system currently has a capacity to carry over 500MW of power. The CEC's transmission and distribution network is concentrated in the Copperbelt Province of Zambia where the company of 2016, NWEC was reported to supplies and distributes electricity primarily to mining companies based on the Copperbelt.

Lunsemfwa Hydro Power Company Limited, another independent power producer, also operates a transmission system in the Central Province of Zambia.

Other independent power producers involved in distribution are North-Western Energy Corporation Limited (NWEC) and Zengamina Power Company Limited (ZPC). NWEC has a license to distribute electricity to

non-mining customers of Lumwana, Kabitaka and Kulumbila areas in the North-Western Province. NWEC purchases power from ZESCO and supplies to its customers. As of end have a customer base of 2,378. ZPC distributes electricity to community service, residential, small businesses and the commercial customers in Ikelenge district in the North-Western Province of Zambia.

Renewable Energy Overview



HYDROPOWER

- Hydroelectric power is the dominant form of renewable energy in Zambia and as of June 30, 2017 accounted for approximately 82.9% of its total generation capacity. However, Zambia is looking to expand on its generation methods due to an over-reliance on hydro generation.
- As of June 30, 2017, there were four main hydropower plants: Kafue Gorge, Kariba North Bank, Itezhi-Tezhi and Victoria Falls.
- According to the ERB, Zambia's hydro generation potential is estimated at more than 6,000MW.

SOLAR

• Solar power is currently being established within Zambia. See Scaling Solar and GET FiT below. • The Rural Electrification Authority (REA) has successfully implemented a 0,06MW (60KW) solar grid pilot project in Mpanta village, Samfya district of Luapula Province, which is currently supplying electricity to a group of villagers. Other than this pilot project, there are currently no other operational grid-connected solar power plants in Zambia. The majority of solar power currently in use is through solar energy systems and products supplied to individual commercial and residential customers.

WIND

- According to the Africa-EU Energy Partnership, wind energy potential in Zambia is not currently considered to be high.
- In August 2017 the US government awarded a USD1.05 million grant to two developers, Access Power

and EREN Renewable Energy, to construct a 500GWh wind farm, the country's first wind power plant.

GEOTHERMAL

- According to information from the Ministry of Energy, there are 80 recorded hot springs in Zambia, some (about 35) of which have good energy potential.
- There is one small geothermal generation plant at Kapishya Hot Springs.
- Feasibility studies are being conducted in the Kafue.

Current issues in the renewables industry

- In 2017, the ERB approved a hike in domestic electricity tariffs charged by ZESCO. This approval saw an increase in domestic tariffs by an average 75%. Early this year, ZESCO again applied to the ERB for an upward adjustment of its electricity tariffs citing prevailing economic conditions, system customer base expansion, and the rising cost of power from its new infrastructure and independent power producers (IPPs) as the underlying factors. The application is yet to be determined by the ERB. In addition, ZESCO has been reported to have expressed an intention to renegotiate electricity tariffs under power purchase agreements entered into by it with independent power producers (IPPs) with the aim of ensuring parity between its buying and selling prices.
- In 2017 the ERB commissioned a "cost of service" study using international consultants with a view to setting appropriate cost reflective tariffs for electricity users at various supply points in the electricity market. However, it is reported that the study was never concluded and the consultant's mandate has since expired. It is yet to be communicated whether the study will be continued or recommissioned.

Government Incentive Schemes



Renewable energy feedin-tariff (REFIT) strategy

The Zambian government has put in place a renewable energy feed-in-tariff (REFiT) Policy aimed at lowering the barriers for increased private sector involvement in renewable energy power generation, increasing power generation through private sector investments in renewable energy (in the short term) and contributing to the creation of a diversified energy mix and increase energy security in Zambia (in the medium term). The REFiT Policy was developed with assistance from US Agency for International Development through the USAID Southern Africa Trade Hub (SATH) that provided both Technical and financial support. The draft REFiT Policy was finalized in April 2015.

The principal stakeholders for the implementation of the REFiT policy are:

- the Ministry of Energy and Water Development (MEWD);
- the Energy Regulation Board (ERB);
- ZESCO Limited; and
- the private sector.

The REFiT Policy provides for objectives aimed to be achieved in two phases. Phase 1 is a three-year period whose objectives are:

- to provide for the development of small-scale renewable energy projects totalling 200MW, of which 100MW would be hydropower and 100MW non-hydropower;
- to provide for the development of an initial 5MW of renewable energy power through micro-generation; and

• to provide a platform for Phase 2 through, inter alia, preparation and issuing of a comprehensive Integrated Resource Plan before end of the three-year period in relation to future generation allocations taking into consideration resource mapping, developments in generation technologies, location, distribution network, etc.

As part of Phase 1, the government undertook to, inter alia, prepare and issue a REFiT tariff for the REFiT allocation, develop a REFiT pricing framework (model); prepare and issue REFiT guidelines, standards, rules and regulations; and prepare and issue standardized licensing agreements, PPAs, connection agreements and implementation agreements for the REFiT program.

In line with the implementation of Phase 1 of the REFiT Policy, the Zambian government launched GET FIT (discussed below). The government has also prepared and issued REFiT rules and regulations, a draft REFiT generation license, a standardized REFiT PPA, a standardized connection agreement and a standardized implementation agreement for projects eligible under the REFiT programme.

The term and specific objectives and action points of Phase 2 are to be determined at the end of Phase 1.

Tax incentives

Currently there are no income tax incentives specifically provided to companies engaged in the renewable energy sector.

Companies engaged in the building and installation of power stations in a multi-facility economic zone or an industrial park are entitled to 0% import duty on capital goods, machinery (including specialized motor vehicles) imported for business operations for a period of five years.

Proposed government incentive schemes

We are not aware of any proposed incentive schemes currently being discussed by the government.

Major Projects/Companies



- Scaling Solar: Zambia signed up to Scaling Solar, a World Bank Group program designed to make it easier for governments to procure solar power quickly and at low cost through competitive tendering and offering prearranged financing, insurance products, and risk products:
 - Enel Green Power and Neoen Consortium won Round 1 scaling solar. Neoen Neoen commissioned its 54MW Bangweulu solar PV plant in March 2019, which is expected to supply as many as 30,000 households and several businesses with electricity. Enel also commenced operations at its 34MW Ngonye solar PV plant in April 2019. Once fully up and running, the plant is expected to produce around 70GWh per year; and
- Scaling Solar Round 2 was announced in 2017 and a request for prequalification was issued. A total of 12 out of 21 bidders have since been announced as prequalified. A request for proposal document is to be sent to the prequalified bidders. There is no further news, however.
- **GET FIT:** GET FiT Zambia is designed to assist the Zambian government in the implementation of its REFiT Policy (see above). GET FiT Zambia aims to procure 200MW of renewable energy projects within the next three years. It supports small- to medium-scale Independent Power Producer (IPP) projects up to 20MW. The initial phase of the GET FiT programme, which was launched in early 2018, had a target outcome of 100MW In April 2019 GET FiT announced the award of six solar PV projects

totalling 120MW to three consortiums, namely, Building Energy and Pele Energy, Globeleq and Aurora Power Solutions and InnoVent and CEC. Each consortium has been awarded two projects. GET FiT also launched a hydropower tender in December 2018. A total of 30 prequalified bidders have since been announced and the request for proposals is expected to be issued in the fourth quarter of 2019.

- Kafue Gorge Lower (KGL) Power **Station:** The Zambian government initiated the construction of the USD2 billion 750MW KGL hydroelectric power station on the Kafue River in November 2015 and looks to be completed by 2020, Zambia has appointed ZESCO for the development of the project. KGL is being built by a Chinese company, Sino-Hydro Corporation.
- Kariba North Bank Hydropower Generation Project: Located in Siavonga on the Zambezi River next to the existing Kariba North Bank Power Station is another 360MW Power Station. A provision for the extension of the existing one was made during the planning and construction of the Kariba North Bank Power Station. Kariba North Bank Extension (KNBE) Power Station was then developed by a Special Purpose Vehicle (SPV) called Kariba North Bank Extension Power Corporation Limited (wholly owned by ZESCO) at an estimated cost of USD420 million.
- Itezhi Tezhi Project: Development of a 120MW hydro power plant by Itezhi Tezhi Power Corporation (a joint venture between ZESCO and Tata Power) at the site of the Itezhi Tezhi dam on the Kafue River. The plant was commissioned in early 2016.

Foreign Investment/Ownership



The Investment Promotion arm of the Zambia Development Agency has the mandate to promote Zambia's investment opportunities locally and internationally in order to attract foreign and local investors in the different sectors of the economy, including energy.

There are no restrictions or limits on foreign ownership; no capital controls and guarantee of investment is available.

Foreign investment/ownership is common in the renewable energy projects being undertaken in Zambia. There has also been a lot of foreign interest expressed in the Scaling Solar and GET FiT programs.

GUARANTEE AGAINST NATIONALIZATION

The ZDA Act provides investors guarantee against nationalization. Please see investment incentives under the ZDA Act below. Further, the Bill of Rights under the Zambian Constitution provides for protection against deprivation of property. Generally no property of any description may be compulsorily acquired or taken possession of by the government unless by or under the authority of an Act of Parliament which provides for payment of adequate compensation for the property acquired or taken possession of. The constitution provides exceptions to this general protection, for example where acquisition or possession is in satisfaction of any unpaid statutory taxes or rates due, or in execution of court judgments or orders.

INVESTMENT INCENTIVES UNDER THE ZDA ACT

The Zambia Development Agency Act No. 11 of 2006 (as amended in 2014) (the ZDA Act) offers a wide range of incentives in the form of allowances. exemptions and concessions for companies. The Act provides for investment thresholds to qualify for fiscal and non-fiscal incentives. There is only one category of investors who can be considered for investment incentives under the ZDA Act, while the rest only receive nonfiscal incentives.

Category 1: Investments of USD500,000 and above in a designated priority sector in a Multi-facility Economic Zone or an Industrial Park. are entitled to fiscal incentives as provided under the Income Tax Act and the Customs and Excise Act. The

building and installation of power stations is designated priority sector under the ZDA Act. This category of investments is entitled to the fiscal incentives set out in the 'Tax Incentives' section above.

In addition to fiscal incentives, this category of investments is entitled to the following non-fiscal incentives:

- investment guarantees and protection against state nationalization; and
- free facilitation for application of immigration permits, secondary licenses, land acquisition and utilities.

Category 2: Investment of not less than USD250,000 in any sector or product not provided for as a priority sector or product under the ZDA Act. This category of investors is entitled to only the non fiscal incentives as follows:

- investment guarantees and protection against state nationalization; and
- free facilitation for application of immigration permits, secondary licenses, land acquisition and utilities.





UNFCCC – Paris Commitments and beyond



Zambia ratified the Paris Agreement on December 9, 2016. In its Intended Nationally Determined Contribution, Zambia set a target of 47% reduction in emissions by 2030.

Relevant Resources and References



Relevant Websites

https://datamorldbank.org/country/zambia

https://www.cia.gov/library/publications/the-world-factbook/geos/za.html

http://taxsummaries.pwc.com/ID/Zambia-Overview https://cecinvestor.com/cecrelease-of-2017-annual-report/

https://www.africa-eu-renewables.org/market-information/zambia/renewableenergy-potential/

References

https://assets.kpmg.com/content/dam/kpmg/pdf/2014/09/taxes-incentivesrenewable-energy-v1.pdf

Energy Regulation Board, Overview of the Energy Sector in Zambia: Case of Renewable Energy, Presentation to the Promoters of Renewable Energy Technologies, November 2015. Available at: http://www.erb.org.zm/content.php?viewpage=rfit

Energy Regulation Board, Statistical Bulletin: January to June 2017. Available at: http://www.erb.org.zm/content.php?viewpage=stbn

https://static1sguarespace.com/static/52246331e4b0a46e5f1b8ce5/ t/598320fb37c 58140e7594109/1501765888030/Paralle1+3B_Besa+Chimbaka_ ERB+Zambia.pdf

https://static1.sguarespace.com/static/58c95e0c5016e18d705d710a/t/5a047a1 1c830258632ad02bc/1510242838567/FINAL_REFiT+Strategy%2C+2017.pdf 177





Zimbabwe

Overview

KEY FACTS

Jurisdictions: The judicial system comprises the Common law (non statutory or unwritten Anglo Roman Dutch Law) Legislation Case Law (Precedent) and Customary Law. It is a plural system, influenced by South Africa 2017 Index of Economic Freedom and shows traits of Roman-Dutch law.

BUSINESS ENVIRONMENT

2018 Doing Business Report: 155 out of 190 economies (dowr

2018 Global Competitiveness: 124 out of 137 (down 2)

174 out 180

2016 Corruption Perceptions Ind 154 out of 176 (down 4)

2016 UN Development programme Human Development Index: 154 out of 188 (up 4)

Population: 16.53 million

GNI per Capita USD1,850

PROFILE

| | The political landscape had been |
|------|--|
| n 4) | dominated by Robert Mugabe since |
| | independence from the British in 1980. |
| | After 37 years in power, Mugabe |
| | resigned in 2017, succeeded by |
| m: | Emmerson Mnangagwa, another |
| | Zanu-PF member. Reforms have been |
| dex: | promised; however, social unrest may |
| | hamper growth. |

Electricity Industry Overview



Zimbabwe's energy market faces the challenge presented by ageing energy assets and infrastructure. Coupled with increasing requirements for electricity consumption, the country has significant potential for investment in renewable energy production and distribution.

The vast majority of the rural population remains unelectrified. Zimbabwean rural households principally rely on wood fuel for their cooking requirements. This presents a vast opportunity in clean energy technologies for cooking and heating. There is also a disparity between the urban and industrial energy demand and the available supply, resulting in a deficit.

Zimbabwe is a participant in the South African Development Community regional electricity grid the SADC Power Pool (SAPP) – where governments can buy and sell power within the pool. Private projects can apply to be market participants in the SAPP.

The market is currently structured in a single-buyer model due to the lack of competition in the distribution of power. The Zimbabwe Electricity, Transmission and Distribution Company (ZETDC) has therefore become the single buyer responsible for purchasing power and selling to all customers as well as importing and wheeling power. However, the market is undergoing a transition and is in the initial stages of moving towards increased competition in the generation, distribution and supply of electricity.
Electricity Laws

- Energy Regulatory Act, 2011 [*Chapter 13:23*].
- Electricity Act [*Chapter 13:19*].
- Electricity (Licensing Regulations) [*Statutory Instrument 103 of 2008*].
- Electricity (Levies) Notice [*Statutory Instrument* 6 of 2008].
- Inefficient Lighting Products Ban Regulations [Statutory Instrument 21 of 2017].
- Electricity Distribution Code Regulations [*Statutory Instrument 47 of 2017*].
- Electricity Grid Code Regulations [*Statutory Instrument 91 of 2017*].



Regulators

The Zimbabwe Energy Regulatory Authority (ZERA) is the regulator tasked with the regulation of the entire energy sector, which includes electricity, gas and petroleum. ZERA is mandated by the Zimbabwe Energy Regulatory Act (Chapter 13:23), as read with the Electricity Act (Chapter 13:19) and the Petroleum Act (Chapter 13:22). ZERA's role is to regulate the procurement, production, transportation, transmission, distribution, importation, and exportation of energy derived from any source through licensing operators in the energy industry in Zimbabwe.

ZERA also regulates the entire energy sector in Zimbabwe in a fair, transparent, efficient and cost-effective manner for the benefit of the consumers and energy suppliers.

ZERA operates independently, managed by the Energy Regulation Authority Board. Previously, it was a state enterprise monitored by the Ministry of Energy and Power Development.

Generation, Distribution and Transmission

The current legislative framework allows for Independent Power Producers (IPPs). It also allows for private sector players to be involved in the generation, supply and distribution of electricity. ZETDC is the national distributor and retailer of electricity, while the Zimbabwe Electricity Supply Authority is the national supplier of electricity through the Zimbabwe Power Company (ZPC).

Renewable Energy Overview



Zimbabwe's renewable energy resource base is made up of: vast solar energy radiation (20 MJ/m²/ day); hydro; municipal solid waste; municipal sewage biogas; agricultural waste; forestry waste.

The dominant types of renewable energy in Zimbabwe are hydro-electric energy and solar energy.

Both public and private projects are in the hydro-electric and solar energy space. The market is not yet experiencing participation from emergent renewable technologies.

Renewables Laws

Currently there is no specific legislative framework for renewable energy generation, distribution and supply. The government has however recently enunciated its policy position with regards to renewable energy in the draft National Renewable Energy Policy (NERP). The NERP is still in draft form and is due to be approved during 2018.

Government Incentive Schemes



- National Energy Policy;
- National Energy Policy Implementation Strategy;
- National Renewable Energy Policy;
- Zimbabwe Biofuels Policy;
- Independent Power Producers framework; and
- Renewable Energy Feed in Tariff.

These policies all work together for better promotion of renewable energy. There are also tax/fiscal incentives for projects depending on the size and scale, which have a designated National Project Status, given the criticality of this sector. Incentives granted to renewable projects typically

include, but are not limited to:

- rebate and suspension of dut imported goods and machine
- offshore foreign currency acc (subject to Exchange Control Approval);
- guaranteed remittance of 100% of dividends;
- upon divestment, repatriation of 100% of invested capital;
- temporary work permits for foreign workers; and
- tax holiday (typically five years).

Major Projects/Companies

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MAJOR PROJECTS

The major project company currently is the publicly owned ZPC.

MAJOR COMPANIES

- The major project is Kariba South extension project, which has an expected initial 150MW generation capacity from Unit 7. A further 150MW is expected to come onto the grid from Unit 8.
- The government funded Tokwe-Mukosi Dam which is being equipped to export 15MW.

Foreign Investment/Ownership



Following the amendment of the country's indigenisation laws, 100% foreign ownership of brownfield and greenfield energy projects is permissible. Accordingly, foreign investors may participate in any capacity as lenders/project sponsors, contractors and equity participants without being subject to ownership restrictions.

UNFCCC – Paris Commitments and beyond



Zimbabwe ratified the Paris Agreement in September 2017. The country's Intended Nationally Determined Contribution contained a commitment to reduce emissions by 33% (relative to a business-asusual baseline) by 2030, The country's development goals identify increased hydro-electric production as key to enabling Zimbabwe to achieve this target.



Appendix A

generation capacity.

Round 1 of the REIPPP programme

EASTERN CAPE

- Dorper Wind Farm (Wind) (100MW)
- Jeffreys Bay (Wind) (138MW)
- Cookhouse Wind Farm (Wind) (140MW)

FREE STATE

• Letsatsi Power Company (PV) (64MW)

LIMPOPO

- Soutpan Solar Park (PV) (28MW)
- Witkop Solar Park (PV) (30MW)

NORTH WEST

RustMo1 Solar Farm (PV) (7MW)

NORTHERN CAPE

- Kalkbult Solar Plant (PV) (75MW)
- Kathu Solar Energy Facility (PV) (75MW)
- KaXu Solar One (CSP) (100MW)
- Khi Solar One (CSP) (50MW)
- Lesedi Power Company (PV) (64MW)
- Mainstream De Aar Solar PV (PV) (48.25MW)
- Mainstream Renewable Power Droogfontein (PV) (48.25MW)
- Noblesfontein (Wind) (75MW)
- Solar Capital De Aar (Pty) Ltd (PV) (75MW)

WESTERN CAPE

- Hopefield Wind Farm/Umoya (Wind) (65.4MW)
- Klipheuwel/Dassiesklip Wind Energy Facility (Wind) (26.19MW)
- Touwsrivier Project (PV) (44MW)

Listed below are a selection of the notable projects announced as preferred bidders under the REIPPP Programme, broken down into rounds in which they were procured, provinces in which they are situated, technology type and

Round 2 of the REIPPP Programme

EASTERN CAPE

- Grassridge (Wind) (60MW)
- Tsitsikamma Community Wind Farm (Wind) (94.8MW)
- Amakhala Emoyeni (Phase 1) Eastern Cape (Wind) (140MW)
- Project Dreunberg (PV) (75MW)

FREE STATE

- Boshoff Solar Park (PV) (60MW)
- Stortemelk Hydro (Pty) Ltd (Hydro) (36.8MW)

NORTHERN CAPE

- Bokpoort CSP Project(TX) (CSP) (50MW)
- Jasper Power Company (PV) (75MW)

- Linde (PV) (36.8MW)
- Sishen Solar Facility (PV) (74.4MW)
- Solar Capital De Aar 3 (PV) (75MW)

WESTERN CAPE

- Aurora (PV) (9MW)
- Gouda Wind Facility (Wind) (138MW)
- West Coast 1 (Wind) (94MW)

Round 3 of the REIPPP Programme

EASTERN CAPE

- Nojoli Wind Farm/Cookhouse (Wind) (87MW)
- Red Cap Gibson Bay (Wind) (110MW)

FREE STATE

• Pulida Solar Park (PV) (75MW)

GAUTENG

• Adams Solar PV 2 (PV) (75MW)

KWAZULU NATAL

• Mkuze (Biomass) (16MW)

LIMPOPO

• Tomburke/Tobivox Solar Park (PV) (60MW)

NORTHERN CAPE

- Ilanga CSP 1/Karoshoek Solar One (CSP) (100MW)
- Khobab Wind (Wind) (138MW)
- Loeriesfontein (Doornpan) 2 Wind Farm (Wind) (138MW)
- Longyuan Mulilo De Aar 2 North Wind Energy Facility (Wind) (139MW)
- XiNa Solar One (CSP) (100MW)









WESTERN CAPE

• Electra Capital (Pty) Ltd (PV) (75MW)

Round 3.5 of the REIPPP Programme

NORTHERN CAPE

- Kathu Solar Park (CSP) (100MW)
- Redstone Solar Thermal Power Project (CSP) (100MW)

Round 4 of the REIPPP Programme

EASTERN CAPE

- Golden Valley wind farm (Wind) (117MW)
- Nxuba wind farm (Wind) (139MW)
- Oyster Bay wind farm (Wind) (140MW)

FREE STATE

- Kruisvallei Hydro (Hydro) (5MW)
- Mpumalanga
- Ngodwana Energy (Biomass) (25MW)

NORTHERN CAPE

- Aggeneys Solar Project (PV) (40MW) Excelsior Project (Wind) (32MW)
- Droogfontein Solar Park (PV) (75MW)
- Dyason's Klip 1 and 2 solar projects
 Solar Capital Orange Loeriesfontein
 (PV) (each 75MW)
 (PV) (75MW)
- Konkoonsies II Solar Facility (PV) (75MW)
- Sirius Solar Project (PV) (75MW)

WESTERN CAPE

- Karusa Wind Farm (Wind) (140MW) (138MW).
- Roggeveld (Wind) (140MW)

Round 4 (extended) of the REIPPP Programme

- WESTERN CAPE
 - Soetwater Project (Wind) (142MW)
 - Perdekraal East Project (Wind) (108MW)

NORTHERN CAPE

- Kangnas Project (Wind) (137MW)
 - Greefspan PV Power Plant Number Two (PV) (55MW)
 - Copperton Project (Wind) (102MW)
 - Garob Wind Farm Project (Wind)

NORTH WEST

- De Wildt Project (PV) (50MW)
- Bokamoso Project (PV) (68MW)
- Zeerust Project (PV) (75MW)
- Waterloo Project (PV) (75MW).

EASTERN CAPE

 Wesley-Ciskei Project (Wind) (33MW)

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